XIII Researchers’ Annual Meeting
Program

8:00 am Registration – Lobby Ignacio Morales Nieva (IMN)
8:45 – 9:45 am Poster Presentations and Breakfast - Lobby IMN Amphitheater
10:00 am Welcoming – IMN Amphitheater
Dr. Sharon A. Cantrell, Associate Vice-Chancellor, Graduate Studies & Research
Dr. Roberto Lorán, Vice-Chancellor, Universidad del Turabo

Panel: Research and Education: Challenges and Opportunities – IMN Amphitheater
Moderator: Prof. Israel Rodríguez, Acting Dean, School of Education, Universidad del Turabo (UT)
Speaker: Dra. Rosita Puig – Professor, School of Education, UT
Panel:
Dr. Félix Huertas, Dean, General Education, UT
Dr. Oscar Saenz, Professor, School of Engineering, UT

12:00 pm Lunch – Lobby IMN Amphitheater
1:00 – 2:00 pm Acknowledgement to Scientific Authors and Distinguished Professors/Researchers – IMN Amphitheater
2:15-3:15 pm Concurrent Sessions
3:15-3:30 pm Coffee Break
3:30-4:45 pm Concurrent Sessions
# Oral Presentations – Concurrent Sessions

**1:30-4:00 pm**

## Session 1 Business and Entrepreneurship – Moderator: Sandra Pedraza

**EAE 102**

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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</thead>
<tbody>
<tr>
<td>2:15pm</td>
<td>Competitiveness of Puerto Rico in the Commercial Air Transport</td>
<td>Tommy Betancourt, Maribel Ortiz Soto</td>
</tr>
<tr>
<td>2:30pm</td>
<td>Electricity Consumption in Puerto Rico: An Econometric Panel Data Analysis for the Period 1984 to 2014</td>
<td>Cesar Rodolfo Sobrino, Yahaira I. Rosario,</td>
</tr>
<tr>
<td>2:45pm</td>
<td>Entrepreneurial Orientation of the University and its Relationship with the Individual Entrepreneurial Competencies of Students</td>
<td>German Broemser, Maribel Ortiz Soto</td>
</tr>
<tr>
<td>3:00pm</td>
<td>Exploratory Research about the Labor Force Leverage as an Economic Springboard: The study is based on an Innovative theory and is applied to Puerto Rico</td>
<td>Emmanuel Guzmán Rodríguez</td>
</tr>
<tr>
<td>3:15pm</td>
<td><strong>Coffee Break</strong></td>
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<tr>
<td>3:30pm</td>
<td>Free Trade Agreement between the United States, Central America and the Dominican Republic</td>
<td>Cesar Sobrino, Edgar Rodríguez, Juan Osorio</td>
</tr>
<tr>
<td>3:45pm</td>
<td>Influential Factors of the G2G Information Exchange in Puerto Rico and its Relationship with Electronic Government Initiatives</td>
<td>José A. Jorge Pagán, Isabel Rivera, Ángel Ojeda, Macedonio Alanís</td>
</tr>
<tr>
<td>4:00pm</td>
<td>Information Disclosure and Privacy Management on Social Networks</td>
<td>Alex J. Camacho-Martínez</td>
</tr>
<tr>
<td>4:15pm</td>
<td>Intrinsic and Extrinsic Factors that Influence Consumers Behavior</td>
<td>Maribel Ortiz Soto, María de los Milagros Santos Corrada, José Flecha, Evelyn López, Virgin Dones</td>
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## Session 2 Business and Entrepreneurship – Moderator: Ángel Ojeda

**EAE 103**

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<tr>
<th>Time</th>
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<th>Authors</th>
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<tbody>
<tr>
<td>2:30pm</td>
<td>Technological alliance that contributes to the new generation's academic performance in higher education</td>
<td>Luis E. Soto, Ángel M. Ojeda, Diana L. Cruz, Julián Hernández, Philip R. Murray-Finley</td>
</tr>
<tr>
<td>2:45pm</td>
<td>The Adoption of Open Source Technologies</td>
<td>Anidza Valentín, Macedonio Alanis, Aury Curbelo, Eulalia Márquez, Ángel M. Ojeda, Philip R. Murray-Finley</td>
</tr>
<tr>
<td>3:00pm</td>
<td>Learning Management System Use to Increase Mathematics Knowledge</td>
<td>Angel M. Ojeda-Castro, Philip R. Murray-Finley, José Sánchez-Villafañe</td>
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<tr>
<td>3:15pm</td>
<td><strong>Coffee Break</strong></td>
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Session 3 Panel Past and Present Issues in English in Puerto Rico – Moderator: Philip Murray

**EAE 101**

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<th>Time</th>
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<tbody>
<tr>
<td>2:15pm</td>
<td>The Teaching of English in Puerto Rico</td>
<td>Evelyn Pérez Mass</td>
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<td>2:30pm</td>
<td>The Success of Bilingual Education in Puerto Rico's Public Schools</td>
<td>Jackeline Martínez Rodríguez</td>
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<tr>
<td>2:45pm</td>
<td>Bilingualism: 21st Century Impact on Puerto Ricans</td>
<td>Philip Murray Finley</td>
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Session 4 Educational Leadership and Educational Strategies and Learning Environments – Moderator: Philip Murray

**EAE 101**

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<th>Time</th>
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<tbody>
<tr>
<td>3:30pm</td>
<td>A Review on Demonstration in Euclidian Geometry: a Case Study</td>
<td>Olga Lucía Quintero Fonseca</td>
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<tr>
<td>3:45pm</td>
<td>Curriculum Design using Alternative Education</td>
<td>Karla G. Sanabria Véaz</td>
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<tr>
<td>4:00pm</td>
<td>Perception of Bullying and Places of Incidence Between Two High Schools in Puerto Rico</td>
<td>Lydia M. Ruiz, Gladiys Betancourt, Brunilda Aponte, Angel M. Ojeda</td>
</tr>
<tr>
<td>4:15pm</td>
<td>Phenomenological Study of Mathematics and Science Integration by K – 6 Teachers</td>
<td>Roxana Auccahuallpa Fernández</td>
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Session 5 Panel: Histografías del decimonónico puertorriqueño: un ejercicio de investigación histórica – Moderator: Félix Huertas

**AGM 152**

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>2:30pm</td>
<td>Historiography About the Modernization of Puerto Rico During the 19th Century</td>
<td>Juan E. Roque Rivera</td>
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<tr>
<td>2:45pm</td>
<td>Historiographical Approach to 19th Century Sugar Industry: Juncos Case</td>
<td>Javier Aleman Iglesias</td>
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<tr>
<td>3:00pm</td>
<td>Reflexions about Immigration in Puerto Rico during the XIX Century</td>
<td>José Lee Borges</td>
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<td>3:15pm</td>
<td>Coffee Break</td>
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Session 6 Panel: Art and Literature: Puerto Rican Diaspora and the Pre-Raphaelites in the Caribbean – Moderator: Jennet Rodríguez

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<th>Time</th>
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<tbody>
<tr>
<td>3:30pm</td>
<td>Unpoliticized Beauty: the Pre-Raphaelites in the Caribbean</td>
<td>Enrique Eduardo Olivarès</td>
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<tr>
<td>3:45pm</td>
<td>The Representation of the Jíbara in When I Was Puerto Rican and Con valor y como dé lugar: memorias de una jíbara</td>
<td>Jennet Rodríguez Betancourt</td>
</tr>
<tr>
<td>4:00pm</td>
<td>Puerto Rican Diasporic Literary Production in the United States</td>
<td>Juanita Rodríguez Betancourt</td>
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Session 7 Panel: Acercamientos textuales: género, recepción, intertextualidad y performance – Moderator: Lorna Polo

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<tr>
<th>Time</th>
<th>Title</th>
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<tbody>
<tr>
<td>2:15pm</td>
<td>Lives of Women: Between Submission and Subversion (From Ancient Greece to Seventeenth-Century Spain)</td>
<td>Lorna Polo-Alvarado</td>
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<tr>
<td>2:30pm</td>
<td>Authorship and Reception: Towards a Hermeneutic Approach to the new philosophy</td>
<td>Beatriz Cruz-Sotomayor</td>
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<tr>
<td>2:45pm</td>
<td>Dogs of Paradise: a converted Jew after the Garden Eden</td>
<td>Luz Nereida Lebrón</td>
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<td>3:00pm</td>
<td>An Approach to the Performance of Identity in Contemporary Puerto Rican Literature</td>
<td>René Rodríguez-Ramírez</td>
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<tr>
<td>3:15pm</td>
<td>Coffee Break</td>
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Session 8 Panel: Los “mal-dijeron”: norma, aceptabilidad y optimalidad en temas de lingüística – Moderator: José A. Santiago

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<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>3:30pm</td>
<td>Metaphorical Thought in Curse Words Within the Spanish Language</td>
<td>Freddy Acevedo</td>
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<tr>
<td>3:45pm</td>
<td>Intervocalic /d/ Deletion in Dominican and Puerto Rican Spanish</td>
<td>José Alberto Santiago Espinoza</td>
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<tr>
<td>4:00pm</td>
<td>Revisiting Acceptability Judgments: Anomaly Detection and Metalinguistic Performance</td>
<td>M.E Medina-Callarotti</td>
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Session 9 Panel: On Your Marks, Get Set, Learn!!! – Moderator: Sylvia Casillas

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<tr>
<td>2:15-3:15pm</td>
<td>On Your Marks, Get Set, Learn!!!</td>
<td>Carlos E. Acevedo-Rivera, Yelitza Franco-Pérez, Raily J. Díaz Rodríguez, Ileanexis Santini-Soto</td>
</tr>
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<td>3:15pm</td>
<td>Coffee Break</td>
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Session 10 Panel: Uncommon alliances: writing centers and biopsychosocial services at Universidad del Turabo – Moderator: Sylvia Casillas

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<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tr>
<td>3:30pm-4:30pm</td>
<td>Uncommon Alliances: Writing Centers and Biopsychosocial Services</td>
<td>Sylvia M. Casillas Olivieri, Karla Montañez Sánchez, Anais Jackson González</td>
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### Session 11 Panel: Por los caminos iniciativos de la investigación – Moderator: Luz N. Lebrón

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<th>Time</th>
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<th>Authors</th>
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<tr>
<td>3:30pm</td>
<td>“A Living Language”</td>
<td>Dayra V. Rivera Sánchez, Alondra Molina Sepúlveda</td>
</tr>
<tr>
<td>3:40pm</td>
<td>Mexican Muralism in Latin America: Diego Rivera, José Clemente Orozco, David Alfaro Siqueiros</td>
<td>Marianela Quesada Barrantes</td>
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<tr>
<td>3:50pm</td>
<td>The maternal instinct exists? The filicidal mothers</td>
<td>Yailin Santiago</td>
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<tr>
<td>4:00pm</td>
<td>Vision of Woman in the Film Pedro Almodóvar</td>
<td>Wilnia G. González Torres</td>
</tr>
<tr>
<td>4:10pm</td>
<td>&quot;Latin America’s Vision in the Musical Projects of Ruben Blades and Calle 13&quot;</td>
<td>Tiffanny N. López-Colón</td>
</tr>
<tr>
<td>4:20pm</td>
<td>Female Genital Mutilation: Mutilation of Women’s Rights</td>
<td>Greycelie Bermudez Morales</td>
</tr>
<tr>
<td>4:30pm</td>
<td>Mafalda and Friends: The Cartoon as Social Criticism</td>
<td>Alejandra Rivera-Santiago</td>
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### Session 12 Applied Engineering and Telecommunications and Networking – Moderator: Alcides Alvear

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<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>2:15pm</td>
<td>A CFD Analysis to the Fin Equation with Constant Cross Sectional Area</td>
<td>Miguel Ángel Ramírez, Gerardo Carbajal, Eduardo Castillo</td>
</tr>
<tr>
<td>2:30pm</td>
<td>Admission to Graduate School of UT</td>
<td>Wilfredo Soto Pagán, Xavier H. Siaca Rosado, Alcides Alvear</td>
</tr>
<tr>
<td>2:45pm</td>
<td>An Experimental Comparison Between Rotor Balancing Methods</td>
<td>Jorge L. Santiago González, Héctor M. Rodríguez, José Santiváñez</td>
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<tr>
<td>3:15pm</td>
<td>Coffee Break</td>
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<tr>
<td>3:30pm</td>
<td>Arduino in Mechanical Engineering</td>
<td>Sergio Mendoza, Jose Montoya, Lisabel Burgos, Edwar Romero</td>
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<tr>
<td>3:45pm</td>
<td>Attitude Determination System (ADS) Module System Board and Software for the CubeSat.</td>
<td>Roberto D. Diaz Jimenez, Ruth Lopez, Miguel A. Goenaga-Jimenez</td>
</tr>
<tr>
<td>4:00pm</td>
<td>Calculation of the Convective Coefficient of a Flat Plate Exposed to a Propane Torch</td>
<td>Diana Hernández Merced, Gerardo Carbajal</td>
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<tr>
<td>4:15pm</td>
<td>Circuitual Modeling for Electrochemical Impedance Detectors</td>
<td>Roberto C. Callarotti</td>
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<tr>
<td>4:30pm</td>
<td>Web &amp; Mobile Application for Particulate Fungi Monitoring</td>
<td>Juan Algenis, Alcides Alvear</td>
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### Session 13 Applied Engineering -Moderator: Gerardo Carbajal

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<th>Time</th>
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<th>Authors</th>
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<tbody>
<tr>
<td>2:15pm</td>
<td>Embedding Network Resilience through Locational Decisions</td>
<td>José A. Santiváñez, Emanuel Melachrinoudis</td>
</tr>
<tr>
<td>2:45pm</td>
<td>Flow Simulation through an Actuator Nozzle for the Respiratory System</td>
<td>Mileissa Valdez Santos, Gerardo Carbajal</td>
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<tr>
<td>3:00pm</td>
<td>Hardware Design of 3-Axis Magnetorquer for an Actuator System</td>
<td>Olga Rivera, Hanibal Soliván, Miguel A. Goenaga-Jimenez</td>
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<tr>
<td>3:15pm</td>
<td>Coffee Break</td>
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### Session 13 Applied Engineering -Moderator: Gerardo Carbajal

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<tbody>
<tr>
<td>3:30pm</td>
<td>High Performance Algorithms for Image processing</td>
<td>Yahya M. Masalmah, Carlos Velez</td>
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<tr>
<td>3:45pm</td>
<td>Potential Use of Thermoelectric Generator Device for Air</td>
<td>Pedro M. Peralta Trinidad, Gerardo Carbajal</td>
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<td>Conditions System</td>
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<td>4:00pm</td>
<td>Reliable 1-Center Location using the R-shortest Path Policy</td>
<td>José A. Santiváñez</td>
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<tr>
<td>4:15pm</td>
<td>Vibration Instabilities in Rotating Machinery</td>
<td>Miguel Delgado Castro, Edwar Romero Hector</td>
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<tr>
<td>4:30pm</td>
<td>Design of a Mechanism for the Determination of Piezoelectric</td>
<td>Mara Melendez, Edwin Gonzalez,</td>
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<td>Constants</td>
<td>Edwar Romero</td>
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### Session 14 Biological, Chemical and Ecological Systems-Moderator: Mariann Vázquez

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<tr>
<td>2:15pm</td>
<td>Antimicrobial Activity from the San Juan Bay Estuary</td>
<td>Jessica González, José R. Pérez-Jiménez</td>
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<tr>
<td>2:30pm</td>
<td>Antimicrobial Activity in Urban Soils</td>
<td>Diane Figueroa Merced, José R. Pérez Jiménez</td>
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<tr>
<td>2:45pm</td>
<td>Characterization of Tree Species in the Guanica Dry Forest:</td>
<td>Maria F. Barberena-Arias, E. Cuevas</td>
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<td>Leaf Phenology and Organic Matter Cover</td>
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<td>3:00pm</td>
<td>cotE, a Reliable Biomarker for the Bacilli</td>
<td>Gricel Ruiz-Ocasio, José R. Pérez Jiménez</td>
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<td>3:15pm</td>
<td><strong>Coffee Break</strong></td>
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<tr>
<td>3:30pm</td>
<td>Global Hypo-Methylation and the Cellular Commitment and</td>
<td>José L. Roig-Lopez, D. Alvarez, A. Rivera-</td>
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<td></td>
<td>Differentiation Of Cells Derived From Human Fetal Neural</td>
<td>Serrano, S. Landrau-Giovannetti, C. Rodríguez,</td>
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<td>Stem Cells.</td>
<td>J. A. Maldonado, P. Lopez, Y. Yamamura,</td>
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<td>J. Monterrubio, J. Rosenthal, S. Pardo</td>
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<td>3:45pm</td>
<td>Human Cofilin Alters the Mechanics of Non-muscle Actin</td>
<td>Jean G. García Díaz, W. Austin Elam,</td>
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<td>Filaments and Severs Them</td>
<td>Hyeran Kang, Enrique M. De La Cruz</td>
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<td>4:00pm</td>
<td>Diversity of Sulfate-Reducing Bacteria along the Martin</td>
<td>Jonathan J. López Carrasquillo,</td>
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<td>Pena channel</td>
<td>Yomarie Bernier Casillas, José R. Pérez-</td>
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<td>Jiménez</td>
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<td>4:15pm</td>
<td>Fungi Belowground in Agricultural Settings</td>
<td>Abisrael Morales Feliciano, Yomarie</td>
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<td>Bernier, José R. Pérez-Jiménez</td>
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### Session 15 Biological, Chemical and Ecological Systems, Environmental and Public Health and Moderador: Dayna Ortiz

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<tr>
<td>2:15pm</td>
<td>Identification of DYPB as a Biomaker in Bacterial Lignin</td>
<td>Jonathan Otero Colón, José R. Pérez-Jiménez</td>
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<td>Degradation</td>
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<td>2:30pm</td>
<td>Mechanisms Maintaining Two Feeding Strategies in the</td>
<td>Stephanie Cruz Maysonet, T'ai H. Roulston</td>
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<td>Moth <em>Symmestrischema lavernella</em></td>
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<td>2:45pm</td>
<td>Photocatalytic Degradation of the UV-filter P-</td>
<td>Loraine Soto-Vázquez, Maria Cotto, José</td>
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<td>Aminobenzoic Acid with As-Synthesized and Commercial</td>
<td>Ducongé, Carmen Morant, Francisco Márquez</td>
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<tr>
<td>3:00pm</td>
<td>The Diurnal Cycle of Rain on Oceanic Tropical Islands</td>
<td>Ronald T. Richards and Anastacio Emiliano</td>
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<td>3:15pm</td>
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**Session 15 Biological, Chemical and Ecological Systems, Environmental and Public Health and**

**Moderator: Dayna Ortiz**

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<tr>
<td>3:30pm</td>
<td>Metagenomic Monitoring of Arsenic Bacterial Transformations</td>
<td>José R. Pérez-Jiménez</td>
</tr>
<tr>
<td>3:45pm</td>
<td>Relationship between Literacy and Health Factors in Puerto Rican Adults</td>
<td>Orville M. Disdier, Francisco Pesante, Marisela Irizarry</td>
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**Session 16 Social and Human Sciences – Moderator: Frank Valentín**

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<tr>
<td>2:15pm</td>
<td>“Researching in Social Science”</td>
<td>José A. Calderón Rivera</td>
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<tr>
<td>2:30pm</td>
<td>A New Heroic Figure: Female Protestors in Puerto Rico</td>
<td>Guillermo Rebollo Gil</td>
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<tr>
<td>2:45pm</td>
<td>Adaptation and application of a Psychodrama model for depression in college students in Puerto Rico</td>
<td>Carlos Miranda Hernández</td>
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<tr>
<td>3:00pm</td>
<td>Comparative Study of Processing Speed Index in Puerto Rican Males with ADHD</td>
<td>Tatiana Pérez Vega</td>
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<td>3:30pm</td>
<td>Correlation between Visual Motor Scores of Development and Perceptual Reasoning in Puerto Rican Adolescents</td>
<td>Raquel López Calderón</td>
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<td>Factores socio-económicos asociados al aumento de la criminalidad en Puerto Rico y países seleccionados.</td>
<td>José Luis Alicea Caraballo</td>
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<tr>
<td>4:00pm</td>
<td>Juvenile Sexual Offenders: Psychosocial profile and judicial intervention in Puerto Rico</td>
<td>Gloriand Zaid Mercado Justiniano</td>
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<tr>
<td>4:15pm</td>
<td>Puerto Rico Comprehensive Animal Companion Survey: Implications for Counseling Psychology</td>
<td>Ursula Aragunde-Khol</td>
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<tr>
<td>4:30pm</td>
<td>Social Media and Cyberbullying: Allies or Enemies?</td>
<td>Lina M. Gómez, Alexandra Prieto</td>
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**Session 17 Social and Human Sciences – Moderator: Ileana González**

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<td>The Guánica Central in the Ensenada Village. Preliminary Study of the Impact of its Closing on its Workers and Settlers</td>
<td>Katia Gil de Lamadrid, Javier Alemán Iglesias</td>
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<td>2:30pm</td>
<td>The interpretation and the implementation of Act No. 54: The experience of faith-based and feminist nonprofit organizations.</td>
<td>María Mercedes Ortiz-Rivera</td>
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<td>2:45pm</td>
<td>The use of Facebook as a Communication Tool in the Puerto Rican Company Scenario</td>
<td>Lina M. Gómez, Ramón W. Borges</td>
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<td>3:00pm</td>
<td>When Gender Norms have Criminal Consequences: Women in the Penal Code</td>
<td>Ariadna Godreau</td>
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<tr>
<td>3:15pm</td>
<td>Coffee Break</td>
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**Session 18: Design – Moderator: Cristiano Carciani**

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<td>Collective Architectures: International Meeting in Puerto Rico</td>
<td>Yazmín M. Crespo Claudio, Omayra Rivera, Andrea Bauza, Irvis Gonzalez</td>
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<td>3:45pm</td>
<td>Manifesto of TechCouturism</td>
<td>Cristiano Carciani, Luca Bagnaschino</td>
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<td>4:00pm</td>
<td>Moda: Versatilidad + Estética en la discapacidad física</td>
<td>Dedsa Colón, Cristiano Carciani</td>
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<td>4:15pm</td>
<td>Reflecting on Modern Reflections: Specular Reflections of Glass and the Reconciliation of Meaning in Modern Architecture</td>
<td>Edgardo Pérez-Maldonado</td>
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8:45-9:45 am
Lobby Ignacio Morales Nieva

1. Photocatalytic Hydrogen Production by Water Splitting Using Semiconductor Nanoparticles Under UV-vis Light Irradiation
   Francisco Márquez, Abraham García, María Cotto, José Ducongé, Carmen Morant

2. Enhancement of Docetaxel-Mediated Anti-Tumor Activity by Curcumin and its Analogs in Highly Metastatic Human Prostate Cancer Cells
   Joanne S. Altieri-Rivera, David Sanabria-Ríos, Gabriela Ortiz-Soto, Piyali Bhattacharyya, José Perez-Jimenez, Eddy Ríos-Olivares and José W. Rodríguez

3. Prevalence of the Antigen Receptor Blocker Protein M among Mycoplasma Species
   Luz V. Arroyo-Cruz, José R. Pérez-Jiménez

4. Ocimum sanctum Linn. – A Medicinal Plant & its Impact on Cancer Treatment
   Piyali Bhattacharyya, Mary Jeanie Sánchez, Karla Miranda López, José W Rodríguez, Anupam Bishayee

5. The PPCD1 Mouse: Genetic Basis and Phenotypic Characterization
   Rochely V. Luna-Serrano, Anna L. Shen, Christopher A. Bradfield

6. Evaluation of the Forest Structure and Composition of Abandoned Agriculture Areas in Land of the Future Eco-Park Tanama
   Selinette Álvarez Rodríguez

7. Isolation and Characterization of Hexadecane-Degrading Bacteria in the Martín Peña Canal in Puerto Rico
   Yomarie Bernier-Casillas, José R. Pérez-Jiménez

8. Synthesis and Characterization of Cobalt and Iron Catalysts for the Production of Diesel
   Diana Olmedo Falcón, Dayna M. Ortíz Rodríguez, Francisco Márquez Linares

   Jannette Perez-Barbosa, Aynet Estrada, Jean Lebron

10. Assessment of the Allergenic Potential of the Tropical Pollen from the Trumpet-Tree (Cecropia schreberiana), the most common Pollen in Puerto Rico
    Angélica Rivera-Alvarado, Cristian Calo-Guadalupe, Félix Rivera-Mariani, Benjamín Bolaños-Rosero
11. Yeast as a biosensor of chlorinated hydrocarbons
   Chris A. Muriel-Mundo, Emmanuel Vazquez-Rivera, Christopher Bradfield

12. Complementary and Alternative Medicine Therapies in Cancer patients: Myths and Facts
   Jessica Mckenzie, Frank Valentin Silva, Madiel Rodríguez

13. The Cardiovascular Effects of Crataegus oxyacantha on G Protein Coupled Receptors and Nitric Oxide Synthase in Endothelial Cells
   Bruyanelis Ramos Aponte, Frank Valentín Silva, Edna Aquino

14. What Factors Facilitate Good Learning Experiences in Clinical Studies in Nursing: Bachelor Students Perceptions
   Lilliana Hernández Robles, Paul Jesús Fericelli, Guillermo López Díaz

15. The effect of using the strategy of an electronic platform in the level of implementation of the argumentative written submission of freshmen students in Basic Spanish courses in a private university
   Maritza Ocasio-Vega
Resúmenes
XIII Encuentro de Investigadores
6 de marzo de 2015

Abstracts
XIII Researchers’ Annual Meeting
March 6th, 2015
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Applied Engineering

Calculation of the Convective Coefficient of a Flat Plate Exposed to a Propane Torch

Diana Hernández Merced, Gerardo Carbajal

School of Engineering Universidad del Turabo, PO Box 3030, Gurabo, PR 00778, USA

The present study was focused on the calculation of the convective coefficient of a flat plate exposed to a continuous flow of hot gases from a propane torch. The study also includes the calculation of the heat transfer rate acting on the plate. The temperature distribution on the flat plate was measured with a thermal infrared camera. Air-water spray was applied to cool down the back side of the flat plate exposed to a propane torch at ambient conditions. Distilled water was used as working fluid to dissipate the heat in the back side of the plate. Spray cooling has good results because it is a combination of forced convection and evaporation process that absorb significant amount of energy. Based on the experimental data it was found that the convective coefficient was 148.41 W/m²∙K and the heat transfer rate on the plate was 3791.79 W respectively.

Energy Generation Using Mechanical Force Simulator for Knee Implant

Gelson Diaz Lozada, Ahmed Carrasquillo Falcon, Reinaldo Cruz Carpena, Jorge Merced Morillo, Christian Santana Quinones, Oswaldo Vazquez Garcia, Edwar Romero

Department of Mechanical Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778

Energy can be harvested from almost anywhere, either through moving objects, heat generators, biological waste, etc. Researches have been conducting energy harvesting studies from natural resources seeking for clean energy. Human body can be considered as an energy source since the human body is in constant motion. This paper will emphasize in energy generation for knee implants using piezoelectric ceramics and the human knee movement for the purpose of monitoring and prevention of implants wear. Also, the implementation of a mechanism simulating the force exerted in the knee during walking activities will be emphasized. In this paper the development of this mechanism and its purpose will be explained.

An Experimental Comparison Between Rotor Balancing Methods

Jorge L. Santiago González, Héctor M. Rodríguez, José Santiváñez

Department of Engineering, Universidad del Turabo, PO Box 3030, Gurabo, Puerto Rico 00778
Rotating components are essential parts of most industrial machinery. Among the many potential vibration problems, mass unbalance is the most common cause of excessive vibration during the operation of rotating machinery. Therefore, rotor balancing is critical for the operation and maintenance of industrial machinery. The two most common approaches for rotor field balancing are the Method of Influence Coefficients and the Four-run Method. Both methods seek to reduce the resulting vibration due to mass unbalance but the required vibration information and instrumentation to determine the balancing corrections differ significantly between the two methods. Although the methodology and approach of both methods are widely known by industry practitioners, there is very little information regarding the performance of both methods in practice. This investigation seeks to perform an experimental comparison between the two methods based on their effectiveness in correcting field unbalance problems. The results from this work are expected to help machinery technicians and engineers in selecting the best approach to solve field balancing issues. Results from the experiments suggest that the Influence Coefficient Method provides the greatest vibration reduction with far less number of iterations.

Reliable 1-Center Location using the R-shortest Path Policy in Hazardous Material Transportation

José A. Santiváñez¹

¹Department of Industrial and Management Engineering, Universidad del Turabo, PO Box 3030, Gurabo, Puerto Rico, 00778 USA,

This paper considers a single facility location model for minimizing the expected number of hazardous material transport accidents. The problem finds application in hazardous materials logistics and provides with the most reliable location on an undirected network with unreliable edges that maximizes the lowest performance level of network service with respect to all nodes. Users are concerned with the network capability to establish a route to some service provider. The objective function minimizes the maximum expected number of unsuccessful responses to demand requests over all nodes and it is known as the reli-minmax problem. A polynomial time algorithm is presented that solves the problem when it is applied on general networks using the r-shortest path policy.

Embedding Network Resilience through Locational Decisions

José A. Santiváñez¹, Emanuel Melachrinoudis²

¹Department of Industrial and Management Engineering, Universidad del Turabo, PO Box 3030 Gurabo, Puerto Rico 00778, USA, ²Department of Mechanical and Industrial Engineering, Northeastern University, Boston, Massachusetts 02115, USA

Critical network infrastructures are vulnerable to intentional or unplanned disruptions, which may render some of their components (links and nodes) non-operational leading to deterioration of service due to path destruction and even disconnectedness (no operational paths) between nodes that provide
service and nodes that receive it. This paper develops models for improving resilience to disruptions on critical infrastructures such as transportation and supply chain networks through locational decisions, i.e., by finding the best locations of service facilities so that resilience metrics are optimized. Network resilience is measured by the ratio of the delivered amount of service, when network disruption occurs, over the total requested service. Availability of service depends on the capability of the network to establish connectivity between service facilities and customers. Models are presented that consider criticality of service provided and average and worst network performance. Efficient procedures are introduced that avoid intractability of the traditional two-terminal reliability calculations needed to measure connectivity, based on closeness between service facilities and customers, that provide location, coverage and routing decisions.

Web & Mobile Application for Particulate Fungi Monitoring

Juan Algenis¹, Alcides Alvear¹

¹Department of Computer Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778

According to the CDC (Center for Disease Control) 22.4% of Puerto Ricans suffer from asthma and that percentage increases to 25.3% in the children between the ages of 5 to 14. This Project's purpose is trying to help people with asthma and other people affected by creating a mobile and web application to display the allergens levels. This has the purpose of making this information more accessible. A new version of the counting software is being made to replace the actual VB (Visual Basic) and Microsoft Access with Java and MySQL. The counts will be uploaded to the Database for each trace processed.

Design of a Mechanism for the Determination of Piezoelectric Constants

Mara Melendez¹, Edwin Gonzalez¹, Edwar Romero¹

¹Department of Mechanical Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778

This paper presents the design and construction of a mechanism that generates a sinusoidal wave in order to obtain piezoelectric constants for low frequency operation. The design is capable to transmit 2500 N (562 lbs), at 1 Hz (60 rpm), to a piezoelectric material. The purpose of this study is the implementation of a piezoelectric material into self-powered knee implants. This could provide a way of monitoring and/or diagnosing defects and failures in the implant. By diagnosing early, harmful failures such as loosing and misalignments can be prevented prolonging the implant’s life expectancy.

A CFD Analysis to the Fin Equation with Constant Cross Sectional Area

Miguel Ángel Ramírez¹, Gerardo Carbajal¹, Eduardo Castillo¹

¹School of Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778, USA

March 6th 2015
A numerical investigation was performed to determine the temperature distribution of a typical fin with constant cross sectional area. The analysis was performed by solving numerically the fin equation with computational fluid dynamic (CFD) software, then the results were compared against the numerical solution obtained by the finite difference method (FDM); additionally, the analytical solution was applied to determine the precision of the numerical approach. In the present study three different fins were used: cylindrical, rectangular, and long rectangular. In order to keep consistency with the solution, the fins were subjected to the same boundary conditions. A convective tip was considered in the calculation; however, the present model can be extended to other conditions. The numerical results were in agreement with the analytical data. The maximum error between the finite difference solution for the cylindrical fin against the analytical and CFD results were 0.01 and 0.0025 percent respectively; in the case of the rectangular fin the maximum error found were 0.064 and 0.26 percent. Additionally, the study includes the effect of different convective coefficients on the fin thermal performance.

**Vibration Instabilities in Rotating Machinery**

Miguel Delgado Castro¹, Edwar Romero¹, Hector Rodriguez¹

¹School of Engineering, Department of Mechanical Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778

This research aims to show information on learning about vibration instabilities sources on rotating machinery. The sources originate from hysteric whirl, the hydrodynamic bearings and seals, aerodynamic vibrations, dry friction and torque deflection. These sources are being studied along with the ways to reduce them. Knowledge about the vibrations instabilities and the ways to reduce them are important to achieve a system to work at operating speeds without suffering from these instabilities. With this work it is expected to achieve an idea of the concept of the vibrations instabilities and what should be taken in care when designing rotating machines.

**Flow Simulation through an Actuator Nozzle for the Respiratory System**

Mileissa Valdez Santos¹, Gerardo Carbajal¹

¹School of Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778, USA

One of the first treatments for respiratory problems is the application of an inhaled medication. Its effectiveness depends on the size and concentration of the particles deposited in the affected area. Metered dose inhaler is the most common treatment used for his precision of the medication dosage, but his low particles dose deposition in the lungs present limitations to the treatment. The focus of the present investigation is to study and analyze the fluid flow of three different spray models for the upper respiratory system: nozzle 1, nozzle 2 and nozzle 3 respectively. A numerical simulation was performed in order to determine the appropriate geometry to distribute effectively the spray particles in the
system. To simplify the complexity of the geometry, this study was done in two dimensions. The numerical results show that nozzle 1 presented the best performance with maximum velocities in the range of 30 to 20 m/s near to exit area, and the pressure drop was 0.6 kPa.

**Hardware Design of 3-Axis Magnetorquer for an Actuator System**

Olga Rivera¹, Hanibal Soliván¹, Miguel A. Goenaga-Jimenez¹.

¹Department of Electrical and Computer Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778

This project proposes the design and development of an actuator system using electromagnetic coils as the only mean for an attitude control system. It provides the three-axis stabilizing capabilities against disturbances resulting from spacecraft environment. The actuator of any satellite it is an important system to allow attitude or orientation. The research aims describe the construction process of three magnetorquers coils to allow torque according to electric currents. Also, an electronic hardware design to control these currents and its direction with low energy consumption. The electronic circuit was based on the magnetorquers design, which includes two coils on a rod and an air coil (without nucleus). Temperature tolerance plays an important factor in the selection of components when the design is implemented, since it can affect its performances in orbit. The entire design has to comply with all the specifications that are established for a 2U Cube-Sat system or module.

**Potential Use of Thermoelectric Generator Device for Air Conditions System**

Pedro M. Peralta Trinidad¹, Gerardo Carbajal¹

¹School of Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778, USA

An experimental study was performed to investigate the potential use of thermoelectric in air conditioning systems. An experimental setup was developed to experimentally investigate the performance of the system when it is exposed simultaneously to a hot and cold stream of air. For this purpose an experimental setup was designed in which a square channel allows the fluid flow of cold and hot air. The hot air was pumped at the bottom section and cold at the top section; the two fluids were separated by a wall. The heat source supplied to the air had a maximum capacity of 1850W and the electrical loads used in the experiments were in the range between 390W and 760W. It was found that the temperature difference between the inlet and outlet of the hot air was affected by the application of an electrical load. Even though significant data were evaluated, there are still ambiguous results that should be further evaluated.
Circuital Modeling for Electrochemical Impedance Detectors

Roberto C. Callarotti¹

¹Department of Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778

In this paper we describe the proper procedure for deriving equivalent circuits which characterize the sinusoidal steady state behavior of novel electrode arrangements to be used in electrochemical measurements. We are particularly concerned with those electrode arrangements where the electric field and the current density distribution are not uniform, thus requiring numerical procedures for the solution of the equations representing the phenomena associated with the metal-liquid interface and the electrical flow in the solution. The measuring probe consists of three planar concentric metallic electrodes. We describe the circuital model which represents the operation of the sensor. The model predicts the equivalence of the system response for the two possible modes of operation having the same ground electrode. We compare the results given by our circuital model with experimental results of steady state impedance spectroscopy measurements, obtaining excellent agreement. The electrode structure analyzed was selected for its potential field application in corrosion measurements in the oil and other industries, particularly in the measurement of the internal corrosion in pipes.

Attitude Determination System (ADS) Module System Board and Software for the CubeSat.

Roberto D. Diaz Jimenez¹, Ruth Lopez¹, Miguel A. Goenaga-Jimenez¹

¹Department of Electrical and Computer Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778.

This project is about the design and development of an Attitude Determination System module hardware board for the QB50 CubeSat. The hardware design circuits for the Sun Sensor such as Photodiode as Sun Sensor and the Solar Panels Currents Circuits. Also a breakdown of which sensors are integrated to the system, their connections and communication protocols for some sensors. The design circuits for the Sun Sensor were simulated successfully on Multisim Simulation Software. Additional in this project the Printed Circuit Board (PCB) was designed for the module hardware board of Attitude Determination System for the QB50 Cubesat. The design should be appropriate for pico-satellites in general while the system was implemented with respect to the already existing hardware and software structures of the satellite.

Arduino in Mechanical Engineering

Sergio Mendoza¹, Jose Montoya¹, Lisabel Burgos¹, Edwar Romero¹

¹Department of Mechanical Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778
The abstract will be in English only. It should describe the objective, briefly the methods, main results and conclusions. The objective of this work is to evaluate the low cost Arduino platform as an educational tool in the Instrumentation coursework of Mechanical Engineering. Traditional data acquisition equipment for engineering is both expensive and proprietary. University equipment is usually limited to be used in the laboratories with few possibilities to be used outside the classroom or even outside the university. The Arduino platform is starting to penetrate university settings because the low cost and ease of use. For some laboratory activities, it can be integrated into the classroom with little difference compared to commercial products. This can makes it possible to even take these devices outside the classroom into the real world for further experimentation within engineering applications at the university level. For this task, several experiments were designed to replace or complement traditional equipment for the Experimental Methods laboratory in Mechanical Engineering. These applications are intended for temperature and vibration measurement. Results show they are comparable in scope to traditional equipment.

Admission to Graduate School of UT

Wilfredo Soto Pagán¹, Xavier H. Siaca Rosado¹, Alcides Alvear¹

¹Department of Computer Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778.

To study is one of the most important decisions in life and when it comes to graduate studies. The world of technology, especially the internet can get a lot more comfort and efficiency when choosing which university you are studying. The process of applying for admission to a university should be a secure, simple and efficient. Currently this process for the graduate programs at the University of Turabo somewhat tempered with the reality of other universities. For this reason, this project will be directed to the improvement of the admission process of doctoral programs at the University of Turabo. The project involves the development of a software product (Web Server & Database) that will allow users to perform all the admission process in an easy, secure and efficient manner. The design it will give admissions officers to process applications much faster, allowing the applicant has an automatic or instantaneous response of all information and documentation relevant to his request; the applicant shall submit the facility required all the digitized data via internet (letters of recommendation, essays, resume, etc.)

High Performance Algorithms for Image processing

Yahya M. Masalmah¹, Carlos Velez¹

¹School of Engineering, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778, USA

Hyperspectral Imagery (HSI) applications involve large data storage and computational power on real time. Grid Computing has become a powerful solution for the current computational challenges. This research outlines a review of the existing best practices for this solution. We deployed and implemented
a generic framework for Desktop Grid Computing on an academic environment using the best solution in the literature. We also deployed a secure network design; and validated it with our target detection HSI application, Constrained Positive Matrix Factorization (cPMF). A description of our application porting or “gridification” process is presents here. The results obtained show us that Desktop Grid Computing is a scalable, reliable, and secure solution for huge data computation in any environment, private or public.
Networks and Telecommunications


Jesús R. Torrado Rodríguez¹, Rafael M. Rivera¹

¹School of Engineering
Universidad del Turabo, PO Box 3030, Gurabo, PR 00778

The implementation of the Enterprise ISMS (Information Security Management System) based on the ISO27001/ISO27002 (International Standards Organization) comprises addressing ten key areas that can generate vulnerabilities in a Global modern enterprise. One of the key aspects to succeed in the event of an attack, is the ability/agility to respond as close as instantaneously as possible to the event. Several considerations are key to succeeding; assets specificity level along with a clear definition of; actions to take to mitigate and/or prevent damage to the defined enterprise asset. A data base containing a clear definition of the assets to be protected along with enablers or actions to be taken to execute effective protection of the asset and key stakeholders affected by the event. Our investigation proposes that an Ontological definition of these assets and the corresponding rules or ‘mitigation intelligence’ required to protect is a key essential component to a strategy that proposes the mechanization, through the creation of intelligent bots (software application that runs automated tasks over the Internet) that, upon detecting the vulnerability will act with a degree of independence from human intervention thus reducing the reaction time to the infection. The ontological design will be the key component required in the development of the intelligent routines (AI) specifically designed for each asset as identified in the data base. In the case of a Global Enterprise, these bots will execute and be constantly monitoring activities within the intranet of the Enterprise. Our investigation is limited to two of the ten key areas associated with the full implementation of the ISMS in the ISO standards definition; these are Assets Management and Communications Management. We expect and propose that the model created for these particular two areas can be replicated and adapted to the other areas for a full ontological approach to implementing the ISMS in a Global Enterprise.
Public and Environmental Health

Assessment of the Allergenic Potential of the Tropical Pollen from the Trumpet-Tree (*Cecropia schreberiana*), the most common Pollen in Puerto Rico

Angélica Rivera-Alvarado, Cristian Calo-Guadalupe, Félix Rivera-Mariani, Benjamín Bolaños-Rosero

1 Universidad del Este, Carolina, PR, 2 Miami Dade College, Miami, FL, 3 Medical Sciences Campus, University of Puerto Rico, Río Piedras, PR

Allergic respiratory diseases, such as allergic rhinitis and asthma, are chronic conditions very prevalent in Puerto Rico. About 14% of children have asthma in PR compared to less than 9% in the USA. We have determined that pollen of the trumpet-tree, *Cecropia schreberiana*, is the most common pollen in PR. It is not known if this pollen may be allergenic, but due to its small size (6 um x 9 um) and high frequency in the outdoor air, it may pose an allergic risk to susceptible individuals. The purpose of this study is to determine the allergenic potential of *C. schreberiana* using the halogen immunoassay. This assay detects the reactivity of the IgE from individuals to the pollen grains by the use of a conjugate of polyclonal goat anti-human IgE by the formation of violet halo around the reactive pollen grain. The pollen was collected from the flowers of the trumpet-tree and transferred onto a thermal-adhesive transparent tape. The pollen particles were sealed with a protein binding membrane to trap the release of allergens. The membranes were exposed to different dilutions of sera from individuals with allergies or healthy volunteers. The halo formation was documented at the microscope and analyzed by the image software Image J. This is the first study testing for the allergenic potential of the most common pollen reported in the outdoor air in PR. It may explain the peak of asthma-related hospitalizations observed during the pollen season in PR.

Yeast as a biosensor of chlorinated hydrocarbons

Chris A. Muriel-Mundo, Emmanuel Vazquez-Rivera, Christopher Bradfield

1 School of Science & Technology, Universidad del Este, PO Box 2010, Carolina, PR 00984 2 Molecular and Environmental Toxicology McArdle Laboratory for Cancer Research, University of Wisconsin-Madison

Halogenated aromatic hydrocarbons (HAH’s) are an enormous group of compounds widely distributed and highly resistant to chemical and biological degradation. These compounds are extremely toxic and with an extraordinary bioaccumulation and biomagnification potential. These properties make compounds like 2,3,7,8 tetrachlorodibenzo [p] dioxin (TCDD) a member of the HAH’s, have a significant impact on human, animal and environmental health. Current methods used for detection and
quantification of HAH’s and its congeners are time consuming and not cost-effective. For this reason, the development of new methodologies for inexpensive and rapid detection and estimation of toxicological parameters of pure compounds and complex mixtures, such like environmental samples. In an effort to contribute with this effort we are studying the toxicological parameters of a variety of compounds using an approach developed in our lab. After exposing the transformants to different concentration of compounds αNF and βNF showed to have AHR activity in our yeast model system with a EC50 of 2.3 x 10⁻⁷ M of αNF and 6.6 x 10⁻⁸ M for βNF.

Metagenomic Monitoring of Arsenic Bacterial Transformations

José R. Pérez-Jiménez¹,²

¹Department of Biology, Universidad del Turabo, PO Box 3030, Gurabo, PR 00778
²Puerto Rico Institute for Microbial Ecology Research, Universidad del Turabo, PO Box 3030, Gurabo, PR 0077

The dissimilatory arsenate-reducing prokaryotes (DARP) constitute a taxonomically diverse group that derives energy from arsenate respiration. Despite the limited biochemical understanding, arsenate respiration is ultimately catalyzed by the arsenate respiratory reductase, encoded by the arrA gene. The congruency between nearly complete arrA and 16S rDNA phylogenies suggests ancient origin for arsenate respiration. We hypothesize that the arrA gene should be common in nature, especially among taxonomical groups comprising the most of DARP. Our aim is to examine the prevalence and diversity of DARP in nature employing bioinformatics and metagenomics approaches. Genetic homologs for arrA from Desulfosporosinus sp. Y5, Bacillus macyae, Shewanella sp. ANA-3, and Sulfurospirillum carboxyolevorans were searched in GenBank. We established a database of twenty-four nearly complete arrA sequences (10 for Firmicutes and 6 for Epsilonproteobacteria. No additional homolog was detected among genome sequencing projects for Firmicutes (674) or Epsilonproteobacteria (77). The metagenomic approach targeted the development of an arrA-based terminal restriction fragment length polymorphism (arr-TRFLP) for a rapid and sensitive disclosure of genetic pool and community analysis. An artificial community of DARP was assembled by combining the nearly complete arrA genes from Desulfosporosinus sp. Y5, Bacillus macyae, B. selenitireducens, Sulfurospirillum arsenophilum, S. carboxyolevorans, and S. multivorans. Amplicon of ~2.1 kb was obtained for the mix and few estuarine sediments. Sediment sample is being subjected to clonal sequencing. In silico analyses for detection of genetic homologs for arsenite oxidases, detoxifying arsenate reductase, and bidirectional oxido-reductases are in progress to design bioreporters. The absence of arrA gene from most prokaryotic genomes known so far suggests prevalence limited to uncommon taxons. However, the nearly complete arrA represents a useful biomarker to ascertain prokaryotes capable of arsenate respiration and monitor the risk of microbial mobilization of arsenate in nature.
Relationship between Literacy and Health Factors in Puerto Rican Adults

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Literacy can be defined as the ability of an individual to read, write and speak, perform mathematical operations, and solve problems to perform properly in society. In 2010 the Puerto Rico Institute of Statistics conducted the Literacy Survey of Puerto Rico (LEA2010) resulting in an estimated adult literacy rate of 92.0% and an illiteracy rate of 8.0%. LEA2010 was conducted as a supplement to the Puerto Rico Behavioral Risk Factor Surveillance System 2010 (PR-BRFSS), which is a telephone survey conducted annually in Puerto Rico for the population aged 18 years and older; therefore, PRBRFSS 2010 database includes health, risk factors and literacy variables. The main objective of this study was to examine the possible relationship between literacy and perceived health status of residents in Puerto Rico. Results showed that literate adults were 3.8 (95% CI: 3.8 - 3.9) times more likely to enjoy a good, very good or excellent health status, in comparison with illiterate adults. On the other hand, literate adults have 58.3% (95% CI: 57.9% - 58.8%) less probability to be living with diabetes, compared with illiterates. Also, in terms of physical activity, literate adults were 2.2 (95% CI: 2.2 - 2.3) times more likely to participate in physical activity, besides their regular job, in contrast to illiterates. All these differences maintained their statistical significance even after adjusting by age and sex. Results demonstrate that literate adults possess a better health, a lower prevalence of diabetes, and a higher physical activity than those illiterate adults. In addition to its importance for the proper performance of the individual in society, literacy seems to be positively associated to the good health of human beings.
Natural and Applied Sciences

The Cardiovascular Effects of *Crataegus oxyacantha* on G Protein Coupled Receptors and Nitric Oxide Synthase in Endothelial Cells

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Endothelial cells occupy a pivotal location between blood and tissue, which facilitates their presence in numerous physiological processes. Blood vessels consist of a layer of smooth muscle surrounding an inner layer of endothelium. In addition to providing a selectively permeable barrier to blood, endothelial cells are vital to maintaining a physiological equilibrium relating to the process of inflammation, platelet aggregation, thrombosis and vascular smooth muscle proliferation. Endothelial cells also modulate vascular tone and blood flow and, in doing so, have profound effects on the overall function of the cardiovascular system. Endothelial cells contribute to the regulation of blood flow, in part through Nitric Oxide (NO) –dependent vasodilation. NO-dependent vasodilation is initiated when agonists (such as acetylcholine and shear stress) activate the endothelial cells phosphoinositol pathway and increase cytosolic calcium levels. *Crataegus oxyacantha*, has been used as both for food and medicinal purposes. *Crataegus oxyacantha* is a member of the Rosaceae family. Other names that this plant possess are *English Hawthorn*, *How*, *Maybush* and *White thorn*. The cardiovascular effects of the *Crataegus oxyacantha* have been shown in animals to be the result of positive inotropic activity to increase the integrity of the blood vessel wall and improve coronary blood flow and positive effects on oxygen utilization, due to flavonoids. (Rigelsky & Sweet, 2002). In our present investigation we will prove, that vasodilation process of *Crataegus oxyacantha* is by Nitric Oxide vasodilation, mainly Nitric Oxide Synthase enzymes, though Reverse Transcriptase Polymerase Chain Reaction initially, in cell culture of Rat Aortic Endothelial cells.

Complementary and Alternative Medicine Therapies in Cancer patients: Myths and Facts

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People with cancer want to do everything they can to combat the disease, manage its symptoms, and cope with the side effects of treatment. Many turn to complementary health approaches, including natural products, such as herbs (botanicals) and other dietary supplements, and mind and body
practices, such as acupuncture, massage, and yoga. The Naturopathic Medicine Doctorate Program started in 2008 at the School of Health Sciences at the Universidad del Turabo, in Gurabo, it’s a four-year program to train holistic primary care physicians. The ND program consists of 278 credits and students are required to complete a minimum of 1,200 hours of clinical experience. Graduates will be required to sit for the Naturopathic Physicians Licensing Examination and pass this exam in order to practice the profession. It has a Research and Scholarship Committee with experts in the nature of Acupuncture, Holistic Medicine such as Mind and Body, homeopathic and nutritional therapies. Its key goals are aligned with the National Center for Complementary and Alternative Medicine Strategic Plan 2013-2015. Among the research its developing is to find molecular and physiologic mechanism by which complementary and alternative medicine work in patients. Our experts treat underserved population which has chronic disease in which traditional medicine is the standard of therapy. Our physicians treat these patients to provide comfort on evidence based medicine. Our purpose is to bring evidenced based medicine in complementary and alternative medicine reports, our committee research interest to your symposium, to open the doors to new and exciting therapies in cancer, which our physicians can offer and furthermore boost the research efforts in general.
Biological, Chemical and Ecological Systems

Fungi Belowground in Agricultural Settings

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Molds and yeasts are microorganisms essential for natural processes in soils. These organisms are heterotrophic and their main source of nutrient is dead organic matter. Plants are associated with fungi that help to fight harmful bacteria and develop faster. The objective of this research is to isolate and identify the molds and yeasts belowground in agricultural soil. Soil samples were collected seven sites in an agricultural site (Gurabo, Puerto Rico), diluted in saline solution (up to 10⁻⁷) and cultivated in Dichloran Rose Bengal Chloramphenicol Agar for one week. Different colonies were isolated into Potato Dextrose Agar and a sterile coverslip was superposed to each isolate. For identification of pure cultures, sandwich wet mounts were prepared with coverslips removed from plates and lactophenol-cotton blue. Fungal isolates were identified by microscopic examination using taxonomical references. Fungal diversity included eight genera at least, including Aspergillus sp., Humicola sp., Penicilium sp., Fusarium sp., Cladosporium sp., Scopulariopsis sp., Curvularia sp., and Thricoderma sp. Greater diversity was found at lower dilutions. Understanding the microbial life of these soils allow us to find fungi with antimicrobial and bioremediation capabilities. This knowledge would help improve the quality and productivity of agricultural processes.

Antimicrobial Activity in Urban Soils

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Antimicrobial activity is commonly found in nature as a defense mechanism for many bacteria. Nowadays, antimicrobial alternatives have become limited for the pharmaceutical industry and health providers due to increasing emergence of antibiotic resistance capabilities. Our objective is to characterize soil bacteria capable of inhibiting bacterial concurrent growth. Soil samples were collected from urban areas in Eastern Puerto Rico. Samples were diluted in saline solution and cultivated in Tryptic Soy Agar and Actinomyces Isolation Agar for a week at room temperature. Growth was examined daily for evolution of inhibition zones and isolation of participant bacteria. Bacterial isolates have been partially characterized based on Gram stain and catalase production. Antimicrobial activity was tested in concurrent cultures of isolates with reference strains in agar plates. Most of the isolates were spore-forming Gram-positive rods, and catalase positives. Among them, six strains demonstrated antimicrobial effect against Acinetobacter baylyi, Bacillus subtilis, Enterobacter aerogenes, Escherichia coli, and Staphylococcus epedermis. We are in the process of completing characterization of isolates by
16 rDNA sequencing. Additionally, growth curves will be conducted to determine in which stage the antimicrobial metabolite is produced for further biochemical characterization.

Photocatalytic Hydrogen Production by Water Splitting Using Semiconductor Nanoparticles Under UV-vis Light Irradiation

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The production of hydrogen by photocatalytic water-splitting, \( \text{H}_2\text{O} (l) \rightarrow \text{H}_2 (g) + \frac{1}{2}\text{O}_2 (g) \), is an environmentally benign process that employs UV-vis radiation acting on new semiconductor catalysts working at atmospheric pressure and different temperatures. Photocatalytic based on Zn, Cd, Fe and Cu, have been synthesized by coprecipitation of ZnS, CdS. Iron and copper nanoparticles were incorporated as cocatalysts to enhance the photocatalytic activity of the ZnCd solid solution. The effect of the different synthesis parameters (synthesis temperature, elemental atomic ratios, amount of Cu and Fe incorporated in the catalyst and calcination temperature) on the photocatalytic production of hydrogen has been studied in order to determine the best experimental synthesis conditions. The catalysts have been characterized by X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), X-ray photoelectron spectroscopy (XPS), and BET. The experiments of photocatalytic water splitting were performed in aqueous solution of the photocatalysts previously dispersed in a soft ultrasonic bath. The photocatalysts were irradiated under different lights ranging from 220 to 700 nm. The photocatalytic activity was found to be clearly dependent on the specific area of the photocatalyst.

cotE, a Reliable Biomarker for the Bacilli

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Members of genus Bacillus are bacteria of great economical and scientific interest, since they have a key role in the environmental, industrial, and medical field. They are Gram positive, aerobic spore-forming bacteria, which can be found almost in every ecosystem in the planet. Bacilli are characterized based on 16S rRNA sequencing analysis, but high level of homology complicates discrimination among closely related strains. To overcome this problem, the gene encoding for the outer spore coat protein E (CotE) was used as an alternative biomarker for specific characterization of Bacilli. Twenty-four different cotE sequences and close homologues were retrieved from GenBank and aligned. The comparison of the homology between Bacillus sp. and closely related bacteria found that cotE gene share 62% of its nucleotide versus near 85% for 16S rRNA gene. Conserved regions, flanking islands of diversity,
were identified for the design of PCR primers. Primers were validated by amplification of the gene on positive and negative controls. First primer pair (cotE-cer) is specific for the *Bacillus cereus* group, since only positive result was found in *B. cereus* and *B. thuringiensis* with an amplicon of ~477 bp. The second set of primer (cotE-sub) amplified cotE for *B. cereus*, *B. subtilis*, *B. stearothermophilus* and *B. licheniformis*, and its produce an amplicon of ~500 pb. Amplicons yielded in vitro the expected size in silico for *B. cereus*, *B. thuringiensis*, *B. subtilis*, and *B. licheniformis*. No amplicon was obtained for *Lactobacillus casei*, *Clostridium sporogenes*, *Streptococcus pyogenes*, *Staphylococcus aureus*, *Serratia marcescens* and *Escherichia coli*. In addition, an in silico restriction enzyme analysis of 70 cotE sequences from 12 different *Bacillus* species was perform to determine a species specific signature. These fragments patterns will allow us differentiate between species and perform TRFLP analysis to environmental samples. In conclusion, analysis of the cotE genes has provided specific primers for discrimination of *Bacilli* taxa.

**Human Coflin Alters the Mechanics of Non-muscle Actin Filaments and Severs Them**

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Actin is a cytoskeletal filament protein that is vital for cellular processes such as motility and muscle contraction. Actin filament networks assembled through interactions with various regulatory proteins provide cells and tissues with mechanical strength and integrity. Vertebrates express three actin isoforms in a tissue-specific manner; α-actin is expressed in muscle and βγ-actin in non-muscle cells. Muscle and non-muscle actin filaments are thought to have different mechanical properties, with βγ actin hypothesized to be more flexible. The regulatory protein coflin binds filaments and induces mechanical changes that promote fragmentation. Previous studies of coflin severing activity have been performed predominantly using skeletal muscle α-actin, and we hypothesized that differences in mechanics influence coflin mediated severing of non-muscle actin filaments. We tested this hypothesis by visualizing individual Alexa 488 labeled non-muscle actin filaments in the presence and absence of coflin. Bending persistence lengths, a metric of filament bending flexibilities, were determined from an average angular correlation analysis of filaments and filament segments. Severing activity was assessed from changes in the average, steady-state filament length. We found that individual muscle and non-muscle actin filaments have comparable bending rigidities under our experimental conditions. Coflin increases the bending flexibility of both actin filament isoforms and severs them with comparable efficiencies.
Antimicrobial Activity from the San Juan Bay Estuary

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Bacteria have developed resistance to antibiotics, which has become a critical health issue impacting the world. Bioprospecting antimicrobial potential among marine microorganism could provide alternative. It has been shown that marine bacteria contain different types of compounds that help health. Our objective is to characterize bacteria with antimicrobial potential from marine ecosystems. Water samples were collected along the San Juan Bay estuary. One milliliter of each sample was cultivated in Tryptic Soy Agar and Actinomyces Isolation Agar by spread plate for a week at room temperature. Media was prepared with site water. Growth was examined daily for evolution of inhibition zones and isolation of participant bacteria. Fifty-five colonies were isolated and purified. Most of these colonies expressed a variety of pigmentation of their phenotype. Bacterial isolates have been partially characterized based on Gram stain and catalase production. Antimicrobial activity was tested in concurrent cultures of isolates with reference strains in agar plates. Most of the isolates were Gram-negative rods, and positive for catalase production. Among them, eight strains demonstrated antimicrobial effect against Acinetobacter baylyi, Bacillus subtilis, Enterobacter aerogenes, Escherichia coli, and Staphylococcus epidermis. We are in the process of completing characterization of isolates by 16 rDNA sequencing.

Enhancement of Docetaxel-Mediated Anti-Tumor Activity by Curcumin and its Analogs in Highly Metastatic Human Prostate Cancer Cells

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Prostate cancer is the most common type of cancer in men and its progression is poorly controlled by existing therapeutic methods. Curcumin have demonstrated to be promising against this disease. Curcumin has shown to suppress inflammation, proliferation, and angiogenesis but has the disadvantage of low bioavailability. To solve this problem novel curcumin analogs were synthesized. In this study, we evaluated whether curcumin and its analogues could augment docetaxel-mediated anti-tumor activity in prostate cancer cells (PC-3). PC-3 cells were cultured and treated with curcumin or its analogues and docetaxel alone or in combination. After 72 hours of incubation, the cytotoxicity effects were determined by MTT assay. Combination treatment of curcumin or its analogues with docetaxel showed higher cytotoxicity than treatment with docetaxel and curcumin alone. We believe that curcumin may
enhance docetaxel-mediated antitumor activity in PC-3 cells by interfering with key proteins associated with tumor proliferation and angiogenesis. This could be a future complementary strategy to reduce the side effects caused by chemotherapy and to enhance the antitumor activity of docetaxel in prostate cancer treatment. This research was supported by INBRE/8P20GM103475 and NIH/RCMI/G12MD007583.

Diversity of Sulfate-Reducing Bacteria along the Martin Pena channel

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Sulfate reducing bacteria, SRB, have played an important role in our ecosystem. These anaerobic bacteria are responsible for the biogeochemical cycle of elemental sulfur as sulfate is used as the final electron acceptor. Many SRB have been demonstrated to degrade organic pollutants under seawater influence. The dissimilatory sulfite reductase genes, dsrAB, have been used as biomarker to characterize the SRB because is the ultimate catalyst of sulfate respiration. Chronically, Martin Pena channel, connecting San Jose Lagoon to San Juan Bay, has been exposed to a accumulation of diverse pollutants threatening environmental and public health. Our objective is to determine the diversity of sulfate reducing bacteria along the Martin Pena channel. Soil samples were collected in nine sites along riverbanks of the Martin Pena channel. Total DNA was extracted for amplification of dsrAB genes. Amplicons digested with NdeII were analyzed by Terminal Restriction Fragment Length Polymorphism, TRFLP. Initially, the dsrAB genes were amplified for two terminal sites of the nine. TRFLP profiles indicate diverse phylotypes dominated by many common phylotypes which relative abundance contrasted among sites. Diverse sulfate reducing bacteria were detected in the Martin Pena channel. Differences between profiles can be influenced by local physicochemical conditions under study, including prevailing pollutants. In order to provide additional insights, metagenomic and soil analyses are in progress.

Identification of DYPB as a Biomaker in Bacterial Lignin Degradation

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Alternative energy sources are essential to plan progress for the nation while harmonizing environmental protection and society comfort. Biomass can be used to generate biofuels by microbial transformation of its chemical constituents. As learned from bioremediation research, microbial capabilities for transformations have been undermined based on selective experimental approaches that underestimate the microbial functional diversity. The microbial diversity in nature is expected to
change as oxygen becomes limited. Anoxia may occur in small (nm) or large (m) regions in soil and water where plant biomass and residual wastes are formed, developed, or processed. Tropical conditions may have favored transformation capabilities due to perennial microbial activities. Lignin represents the most recalcitrant fraction on plant debris for decomposition. Fungi degrade lignin but are difficult to manage in applied processes. However, few bacteria are reported to degrade lignin by dye-decolorizing peroxidases (dypB). We proposed to develop a molecular tool for the detection and characterization of lignin degrading bacteria based on selected catabolic genes (dypB). The prevalence of dypB genes in nature will be assessed by bioinformatics analyses, community analyses, and enrichment cultures. Initially, genetic homologues for dypB gene from Rhodococcus jostii (gram-positive bacterium) are sought among sequence genomes. In search of a broad coverage of bacterium Actinobacteria has produced the most relevant homologs within the gram-positive bacterium. Proteobacteria produced the most relevant within the gram-negative bacterium based on identity and coverage percentage. Homologues of Pseudomonas Aeruginosa were sought due to the dypB gene known within the genome. Nucleotide sequence homologue to dypB will be aligned to design oligonucleotide primer to assess their prevalence across Neotropical ecosystems and active lignin-degrading consortia. The biomarker proposed will disclose the dypB gene diversity in nature to guide potential application for biofuel generation.

Global Hypo-Methylation and the Cellular Commitment and Differentiation Of Cells Derived From Human Fetal Neural Stem Cells.

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Changes in the epigenetic status of a stem cell modify the gene and protein expression profile that can result in an alteration in cell fate and determination. Primary cultures of human Neural Stem Cells (hNSC) from fetal tissue were used to study how in vitro demethylation influences the cellular commitment and differentiation towards neural or glial lineages. hNSC were characterized at the precursor stage and after differentiation. The derived cells were labelled with glial (GFAP) and neuronal markers (Beta tubulin III) to score the lineage commitment. Other markers such as O2 and Glutamine synthetase were used to verify lineage. Treatment with the hypomethylating agent 5-Aza-Deoxycytidine significantly decreased the percentage of neurons derived from hNSCs. Neurons derived from both control and experimental hNSC groups had ionic currents characteristic of physiological bona fide neurons. No statistical difference was found for GFAP, however we observed a tendency towards a higher number of GFAP positive cells when treated with the hypomethylation agent. In order to elucidate a more precise lineage analysis Flow cytometry using both, Beta tubulin and GFAP marksres will use to characterized adn check for significant differences in percentages of label markers and lineage committent. The results from these experiments will help predict changes in the commitment and
differentiation of human neural precursor cells and could be applied to the development of cell replacement therapies. *This project was supported by grants from the NIGMS (8P20GM103475-12) and MBRS-RISE at UNE (2R25GM066250) from NIGMS, (G12MD007579) NIIMHHD-NIH, RCMI Program-PSM.*

**Photocatalytic Degradation of the UV-filter P-Aminobenzoic Acid with As-Synthesized and Commercial TiO$_2$**

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The photocatalytic degradation of p-aminobenzoic acid was studied using TiO$_2$ nanowires synthesized by a hydrothermal procedure as catalyst. The as-synthesized TiO$_2$ nanowires were fully characterized by SEM, XRD and Raman. A very high surface area of 512 m$^2$g$^{-1}$ was determined. The photocatalytic degradation of p-aminobenzoic acid was carried out less than 180 minutes of constant radiation and the results were compared with P25 as commercial catalyst. Optimal experimental conditions were determined for TiO$_2$ nanowires with a catalyst dosage of 1.0 g L$^{-1}$ under acidic conditions with a 20 µM p-aminobenzoic acid solution obtaining 95% of degradation. Under similar experimental conditions comparative studies were performed obtaining 98% of degradation when P25 is employed. A pseudo first order reaction was determined for both systems with constant rates of 2.0 x 10$^{-2}$ min$^{-1}$ and 2.4 x 10$^{-2}$ min$^{-1}$ for TiO$_2$ nanowires and P25, respectively.

**Prevalence of the Antigen Receptor Blocker Protein M among Mycoplasma Species**

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The bacterial genus *Mycoplasma* has relevance for health, agribusiness, biotechnology, and environment due to its harmful potential while harboring a minimal genomic content. Molecular biomarkers developed for clinical applications are anticipated to be limited on detecting *Mycoplasma* diversity in the nature. We aim to propose a molecular biomarker with broad application. The transmembrane Protein M (MG281 gene) from *Mycoplasma genitalium* G37 blocks antibody-antigen union irrespective of their specificity. Our objective is to assess the prevalence of Protein M among species of *Mycoplasma*. The original nucleotide encoding (1671 bp) and amino acid (556 residues) sequences for Protein M were obtained from GenBank and Protein Database in NCBI, respectively. Nucleotide and protein homologs were determined by Genomic BLAST. The complete genome sequences accessed by Genomic BLAST are considered the most robust genomic information due to strict quality controls prior publication. Seventy-one genomes were available for *Mycoplasma*. Nucleotide homology, using blastn with sequenced genomes for Mycoplasma, showed a similarity range
from 99-100% with coverage of 100% for *M. genitalium* G37, M6320, M2321, M6282, and M2288. At amino acid level (blastp), Protein M similarity ranged from 26-100% and coverage from 15-100%. The closest homologs at Protein level were *M. genitalium* (100% similarity), *M. pneumoniae* (98%), and *M. gallisepticum* (71%). *Mycoplasma iowae*, *M. imitans* (both 48%), and *M. penetrans* (44%) showed minimal homology. Protein M, recently discovered for *Mycoplasma*, is minimally represented among sequenced genomes for the genus. Thus, it is not suitable candidate for biomarker. Further assessment will be conducted with other functional genes.

**Characterization of Tree Species in the Guanica Dry Forest: Leaf Phenology and Organic Matter Cover**

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The Guanica Dry Forest is a Unesco Biosphere Reserve that presents high species diversity, including many native and endemic species that occur in specific vegetation associations such as the dwarf coastal forest. The purpose of this research was to characterize the tree architecture of five tree species, specifically tree and leaf characteristics, phenology and the relation to organic matter cover seasonal fluctuations. The study was conducted in the karstic coastal plateau in the Guanica dry Forest where dwarf trees form monospecific islands isolated from each other by exposed rock. Five tree species were selected, and 10 trees/species were sampled. The phenology of each species was determined from the literature. Each tree was measured for height, canopy cover, and leaf size and toughness. Also, organic matter was measured six times between November 2004 and November 2005, to include seasonal variation. Two species were canopy renewers, two evergreens, and one was deciduous. The species varied in height and canopy cover, and in leaf size and toughness. The variations in organic matter cover were related to phenology and seasonal variations in precipitation.

**Ocimum sanctum** Linn. – A Medicinal Plant & its Impact on Cancer Treatment

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In the modern trained the rising of interest of herbal drugs in the health and their benefits are opening new way for natural medicinal products. Plants have been used by men from ancient ages to get rid of suffering & curing ailments. *Ocimum sanctum* Linn., known as “Tulsi” or “Holy Basil”, is considered to be the sacred herb of India. Several anatomical parts of *O. sanctum* (leaves, stem, flower, root, seeds and even whole plant) are known to possess an impressive number of therapeutic properties and
accordingly find use in several traditional systems of medicine, such as Ayurveda, Unani and Siddha. **Method:** Especially two methods are used for extraction of *O. sanctum* for experiments. a) Aqueous Extract (AE). Fresh leaves of Sanctum need to reflux with distilled water and need to filter, it contained active principle components. b) Ethanolic Extract (EE). Dried powdered leaves were soaked for 48 h in ethanol and filtered. The filtrate was evaporated to dryness and a crude paste was suspended for use for experiment, where active principle components are stored. **Result:** Scientific investigations have revealed that *O. sanctum* has a plethora of biological and pharmacological activities. The presence of an impressive number of phytoconstituents in *O. sanctum* could explain its exceptional beneficial effects. Although several recent articles provide an overview of the various pharmacological properties of *O. sanctum*, the use of this herb for either prevention or therapy of oncologic diseases has not been exclusively and critically discussed in the chart. **Conclusion:** The present review critically and comprehensively examines the current knowledge on chemo preventive and therapeutic potential of *O. sanctum*. The review also examines, in detail, the biochemical and molecular mechanisms involved in the antineoplastic effects of *O. sanctum*. Finally, the current limitation and future directions of this research is towards the effective use of this ethno medicinal plant for the prevention and treatment of human cancer.

**The PPCD1 Mouse: Genetic Basis and Phenotypic Characterization**

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Posterior Polymorphous Corneal Dystrophy (PPCD) is an autosomal dominant disorder that causes epithelialization of the corneal endothelium. In some cases, this disorder leads to visually significant corneal edema and glaucoma. Human PPCD is characterized by presence of abnormal corneal endothelial cells that show epithelial characteristics, including inappropriate cytokeratin expression. PPCD1 mice present enlarged eyes and anterior chamber as a consequence of epithelialization of the corneal endothelium and proliferation of the epithelialized cells in the iridocorneal angle. Mapping shows that mouse PPCD1 locus is on Chromosome 2 and is syntenic to the human Chromosome 20 PPCD1 locus. A previous study has identified a hemizygous 3.8 Mbp chromosomal inversions coupled with an 87,000 bp deletion in the mouse PPCD1 locus. The two disrupted genes are Csrp2bp and DZank1. The overall goal of this study was to identify the progression by which the chromosomal rearrangement leads to the observed phenotype in mice with different genetic background; DBA/2J (DBA) and C57BL/6J (B6). Tail DNA was isolated and PCR genotyping was performed to distinguish mutant and wild- type animals; and to identify PPCD1 mice. Immunohistochemistry (IHC) in eye sections allowed the phenotypic identification of wild- type and mutant animals and observation of developmental progression. Briefly, sections were incubated overnight with 1:100 dilution of E-cadherin as primary antibody to observe mesenchymal to epithelial transition in mutant eyes. Other sections were incubated with anti- cytokeratin (Clones AE1/AE3) for an hour at a dilution of 1:500 to observe the developmental expression of pan- cytokeratin in mutant eyes. PCR genotyping showed that both DBA
and B6 mice expressed wild type and mutant bands and identified PPCD1 animals. Phenotypically, PPCD1 mice on the DBA background displayed much enlarged eyes by eight days after birth, and strong E-cadherin and pan-cytokeratin immunoreactivity by three weeks of age. The appearance of these phenotypes is slower and different in PPCD1 mice on the B6 background. E-cadherin expression in epithelialized endothelial cells confirms the hypothesis that these abnormal corneal endothelial cells have undergone mesenchymal to epithelial transition. Slower progression on the B6 background suggests the presence of genetic modifiers that influence development/progression of the PPCD1 phenotype.

The Diurnal Cycle of Rain on Oceanic Tropical Islands

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It is a popular belief that on some oceanic tropical islands it rains every day at the same time. This study will examine the diurnal rain cycle on oceanic tropical islands. The hypothesis is that on oceanic tropical islands, the ratio of the afternoon, between 1200 and 1700 hours, to predawn, between 0000 and 0500 hours, rainfall will have a linear correlation with longitude. The trade winds blow from the east, when the air enters the island the humidity is higher, and the rain can occur at any time of the day or night. In the western part of the island the air is drier and it only rains in the afternoon when the diurnal heating cycle causes rising air over the island. This study uses 15-minute rainfall data from 9 stations in Oahu, Hawaii and 44 stations in Puerto Rico. The data was collected by the United States Geological Survey and was on the Internet. The hypothesis is correct for both islands. On Oahu the afternoon/predawn ratio ranges from 0.61 to 2.9, the Pearson correlation coefficient is 0.86, and the p-value is 0.003. On Puerto Rico the afternoon/predawn ratio ranges from 0.48 to 130, the Pearson correlation coefficient is 0.57, and the p-value is $6 \times 10^{-5}$. After a log transformation of the Puerto Rico data, the Pearson correlation coefficient rises to 0.78 and the p-value drops to $4 \times 10^{-10}$. The linear correlation is trying to find a straight line that best fits the data. With the log transformation the data is being matched to an exponential curve that gets steeper towards the west. The popular perception is correct. On the western part of oceanic tropical islands the rain is much more common in the afternoon than at other times of the day.

Evaluation of the Forest Structure and Composition of Abandoned Agriculture Areas in Land of the Future Eco-Park Tanama

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Three abandoned agriculture farms were assessed in the municipality of Utuado, Puerto Rico to determine the vegetation structure and composition of a secondary forest, and to provide recommendations for the development of an eco-tourism park. Tree species were measured and identified in all three parcels using the Luquillo Forest Dynamic Plot Method (LFDP). The diameter at breast height (dbh) ≥ 4cm, full tree, tree height and estimated structural indices (basal area, tree density and Importance Value (IV) species) were used. Important topographical features of the site such as elevation, slope, soil type, moisture and pH were considered. Also, during the field work, the forest profile of each plot was completed. A total of 365 trees of 24 species belonging to 17 different families were documented. Of these 24 species, 20 are native, of which five are being fast-growing pioneer species typical of disturbed areas. We found three different families of introduced species (Pinus caribaea v.hondurensis, Sphatodea campanulata and Coffea robusta) and a naturalized species (Eugenia jambos) commonly known as rose apple. On plot A, the introduced species of rapid growth IV Pinus caribaea v.hondurensis, had highest grows. Plot B the species with the highest IV (importance value) was Miconia pracina, a native pioneer of rapid growth and on Plot C, and the species with a higher IV (importance value) was the Guarea guidonea, a native species with moderate growth that reaches over 20 m full grown. In the past, the three plots showed differences in agricultural land use, which shows a structure and composition characterized by the difference in time of natural succession. The plot A demonstrated an early stage of succession in the forest type IV, dominated by introduced species (Pinus caribaea v.hondurensis), while plot B was found at an early stage of succession in the forest type III dominated by pioneer species such as (Miconia pracina) of rapid growth typical of disturbed areas. Plot C proved to be in a mature stage of succession in the forest type III, dominated by native species typical of the area that have been used for shade grown coffee (Inga vera). A comprehensive reforestation program aimed to improve the degraded habitat plots A and B due unsustainable agricultural and forestry practices is recommended.

Mechanisms Maintaining Two Feeding Strategies in the Moth Symmestriscema Lavernella

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Traditional explanations for specialized host use patterns by herbivores include evolving to use high quality plant hosts, avoid natural enemies and make efficient use of the most common food resource in the environment. While several studies have combined two of these hypotheses, we are still in need of understanding how an increasing number of factors interact to determine herbivores’ diets. Symmestriscema lavernella is a phytophagous gelechiid moth whose hosts appear to be limited to the genus Physalis (Solanaceae). Flower buds and fruits serve as larval substrates producing budworms and frugivores, respectively, and both strategies are used in each of the 3+ generations of the moth.
However, each larva can adopt only one strategy, leading to the prediction that the most profitable strategy should persist over time. Alternatively, frugivores and budworms would coexist if selective pressures render both strategies similar in costs and benefits or show enough variation to impede fixation on the most profitable strategy. This study was aimed at explaining the occurrence of these two feeding strategies in *S. lavernella* by assessing the effects of larval substrates on growth performance and survival, and resource availability through field observations and experiments. Frugivore pupal weights were found to be 33% greater than in budworms. Moreover, frugivores showed greater survival than budworms in natural patches of their host plant. However, natural enemies were rare, suggesting these are not important agents of mortality—at least in late summer, when this study was conducted. On the other hand, lab experiments showed that the feeding strategy chosen corresponds to the size of the floral bud entered: caterpillars that enter small floral buds (<4.2mm) adopt the budworm strategy; caterpillars that enter larger floral buds or open flowers adopt the frugivore strategy. Together these findings indicate greater body size and survival in frugivores favor frugivory but its benefits are limited by the availability of floral buds large enough to support frugivores. Given that each fruit supports only one frugivore, *S. lavernella* faces high intraspecific competition and thus, a high opportunity cost in avoiding small buds, favoring maintenance of the budworm and frugivore strategies.

**Isolation and Characterization of Hexadecane-Degrading Bacteria in the Martín Peña Canal in Puerto Rico**

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Alkanes reach the environment by anthropogenic activities and natural processes. Bacterial contribution to alkane degradation has been documented for polluted and temperate sites. The objective of this research is to isolate and characterize putative hexadecane-degrading bacteria across the Martín Peña Canal. Soil samples, collected in the Martín Peña Canal, were cultivated, as consortium, on rich media to obtain the native microbiota. The community was described using 16S rDNA-TRFLP profiles, which result in a high diversity among study samples. Alkane-degrading bacteria (ADB) were isolated by aerobic cultivation on mineral media supplemented with specific alkane as sole carbon source and subjected to 16S rDNA sequencing. Isolates have been evaluated for polyhydroxyalkanoates (PHA) production and resilience test (temperature, 5% NaCl, osmotic pressure, EPS production, among others) that are advantageous for plant development to promote rhizoremediation. Seven ADB, mostly *Klebsiella* strains, were isolated in hexane but were also able to degrade isoctane and hexadecane. Preliminary results have demonstrated several strains capable of producing PHA, important in the production of bioplastics and rhizosphere survival. To seek a better understanding of the Canal and the degradation of hexadecane at a molecular level, soil samples were taken from nine points along the 3.5 miles. Bacterial communities of these samples were described using 16S rDNA-TRFLP profiles. Preliminary results have shown distinct communities for certain regions. ADB prevails across Neotropical ecosystems, despite
pollution level, are phylogenetically diverse, and harbors novel genetic variants. These alkane-degrading bacteria provide novel isolates to deal with pollution and disclose processes in nature.
Business and Entrepreneurship

Information Disclosure and Privacy Management on Social Networks

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Privacy, in the digital age, can be a utopia; however the concept of privacy should be analyzed as a main feature of social life. People decide what circles make up their environment and what information can be managed and distributed to each of them. In this context, these privacy practices are applied to virtual spaces such as the social networks. In online social networking users are responsible of privacy management, which is implemented by configuring and controlling flow of data. However, the inappropriate use of configuration tools can put users in a potentially hazardous situation, making available their information to unauthorized persons. Intimacy, self-disclosure and interpersonal communication play an essential role in information disclosure behaviors. The current study explored undergraduate student’s information disclosure and privacy management on social networks. The research data were collected through an online questionnaire, considering different aspects of the relationship between mobile and non-mobile devices, individual privacy rules, and possible risks privacy behavior. The findings showed that users have a lack of mechanisms to manage their privacy in social networks through mobile devices. These mechanisms would ensure greater security for your personal information. Also, that user prefers mobile devices to access social networks and online exposure represents the largest perceived risk. In conclusion, privacy management education is necessary to protect online privacy among users to avoid privacy risk issues.

Learning Management System Use to Increase Mathematics Knowledge

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This research aimed to compare comprehensive math exam scores between an experimental group that used computer and software instruction, with a control group that was engaged in traditional math instruction and did not receive the treatment. The study followed an experimental design and used a t test that yielded results of 99% confidence. The entire population of students taking freshmen
mathematics was a part of the study, with a total of 579 students. They were divided into two groups based on their entrance exam performance. Students in the experimental group had considerably lower entrance exam scores, as compared to the control group of the study. There were 292 participants in the experimental group and 287 participants in the control group. Although students in the experimental group had significantly lower entrance exam scores, both the experimental and control group had to take the same final comprehensive exams which consisted of linear equations, polynomials, exponents and linear inequalities. Statistical results demonstrated that students, who participated in the experimental group with the computer and software instruction, had a significantly difference, and greater performance in math scores, as compared to their control group counterparts.

The Adoption of Open Source Technologies

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The principal objective of this study was to determine the factors that can influence the adoption of open sources technologies and to compare their use among four campuses of a public university in Puerto Rico. Six variables were identified as independent factors and one variable was identified as a dependent factor. A questionnaire was administered to 360 students and professors. The statistical U test of the Mann-Whitney and Spearman was used to support or not support each of the hypotheses of the study. The results of the study demonstrated that a significant influence in each of the six factors: compatibility with the existing applications (r = .386, with value of p = .000 y < .05), ability to try the software before its implementation (r = .353, with value of p = .000 y < .05), licenses that are distributed with the software (r = .228, with value of p = .000 y < .05), technological skills of the information systems personnel (r = .225, with value of p = .000 y < .05), the cost (r = .321, with value of p = .000 y < .05); the compatibility with existing applications, the ability to try the software before implementation, and the cost, which was the factor that had the most correlation with the adoption of open source technologies. The results of the study revealed that the cost (r = .321, with value of p = .000 y < .05) had a significant effect on the adoption of the open source technologies.
Electricity Consumption in Puerto Rico: An Econometric Panel Data Analysis for the Period 1984 to 2014

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The electricity sector is a sensitive sector for the economy of Puerto Rico because the Puerto Rico Electric Power Authority (PREPA) is the sole provider of power on the island. The following study analyzes the demand for energy (residential and industrial) in Puerto Rico. The objective is to determine how the average price per Kwh, the local gross national product municipal (GNP) and the customers affect the energy consumption. We used an econometric model with panel data. Since we set up a nonlinear model of demand the main estimated coefficients will be demand price and income demand elasticity. The techniques used in the model are the Fixed Effects, Random Effects, and Consolidated Effects (pooling). The Hausman test is used to determine which model had a better fit. Data of the 78 municipalities (counties) of Puerto Rico for time series comprised from the year 1984 to 2014 was used. The relationship between average price per Kwh and consumption of energy is highlighted. The model presented coefficients of -0.022 for the residential use under the fixed effect and -0.14 for the industrial consumption under the fixed effect, and reductions of 0.022% and 0.14% in the residential and industrial consumption respectively. The result is inelastic because if the price grows one percent the quantity demand falls in less than 1%, i.e., the quantity demanded is insensitive to price changes. As for the income, the result shows that it is a normal good. The aforementioned results are due to the fact that there are few substitutes for energy on the island. As income levels grow, so does the energy consumption levels.

Free Trade Agreement between the United States, Central America and the Dominican Republic

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This study will analyze the economic integration of Puerto Rico to Central America and the Dominican Republic because of the Free Trade Agreement between the United States, Central America and the Dominican Republic (DR-CAFTA), (World, B., 2005). The Trade Agreement was considered part of the strategy of economic development of the region. On this point is that this agreement gains importance, given that this could be the means that integrates Puerto Rico to the regional economy of Central America. The purpose of the research was to determine the impact of the Free Trade Agreement between the United States, Central America and the Dominican Republic, in terms of the trade volume that it represented for Puerto Rico. For our analysis, a model was used, which is a variant of equation models of gravity. The models of gravity are part of the analytic transformation in the international economy. They allow having an approximation about the effect that the utilization of instruments of
trade policy, as well as preferential agreements, may have on the behavior of the trade flow (Frago, M.S., Benito, R. C. & Sanz, 1989). The variable Distance is one of the fixed effects that were used to explain the volume of Commercial capital of trade. In general terms the model presents an excellent statistical adjustment. This implied that the Trade Agreement of U.S., Central America and Dominican Republic have effect in the level of trade of P.R. and partner countries. The RGDP has a positive effect with the volume of trade with the member countries of the agreement. The gravitational model satisfactorily explains the trade relationship of P.R. with the Central American countries conformed by the CAFTA. The model leads us to conclude that CAFTA has not helped P.R. to integrate to the Central American regional economy. The benefits of the CAFTA depend on how efficiently the tariff preferences are currently used. The exports of the countries members to the United States may increase growth rates at a significant level. This is the case of the food processing industry and of the textile industry.

Exploratory Research about the Labor Force Leverage as an Economic Springboard: The study is based on an Innovative theory and is applied to Puerto Rico

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The objective of this research is to provide a possible solution to governments with nominal problems. Governments with excessive employees tend to fire them, hence affect their life environment and the economy of the country. The focus of this research is to provide a solution to reduce the amount of employees in the government without affecting their economic cycle and improving the private industry economy. The introduction, methodology and results are grounded on theory building. But a secondary data base of ten years was used to investigate if the private or public sector in Puerto Rico has the power to influence the unemployment. The three constructs were the private sector and public sector as the independent variables and the unemployment as the dependable variable. Multiple statistical analysis were used including analysis of factors, alpha the Cronbach’s, linear regressions, multivariate regressions, and bivariate analysis. The results were promising toward the solution of reducing the nominal rate of the government without affecting the unemployment and stimulating the private industry economy.

Entrepreneurial Orientation of the University and its Relationship with the Individual Entrepreneurial Competencies of Students

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One of the greatest challenges that universities are facing currently, is the development of individual entrepreneurial skills in students in such a way that the knowledge and skills obtained may help them
succeed in the creation of an enterprise and take advantage of business opportunities. Universities are increasingly aware of the fact that they should take an active role in the generation of the entrepreneurial spirit in their students through the development of entrepreneurial capabilities. Institutions that show high levels of risk-taking, innovative and proactive behaviors have strategic positions focused on the entrepreneurial orientation. In order of an academic institution be recognized as entrepreneurial university it is necessary a transformation not only of its objectives and strategies, but of their organizational behavior and culture, both at the institutional and staff level. The objective of this research is to determine if the entrepreneurial orientation of the University measured in terms of the variables: innovation, risk-taking and pro activity has a positive impact on the individual entrepreneurial competencies of students of School of Business and Entrepreneurship of Universidad del Turabo. The explanatory study used a quantitative method. A convenience sample of 200 students (100 undergraduate and 100 graduate) was used. Correlation analysis was used to test the hypothesis. When analyzing the relationship between the variables that define the entrepreneurial orientation (innovation, risk-taking and pro activity) of the University with individual entrepreneurial competencies of students, the results show that there is a significant relationship between the entrepreneurship orientations, specifically in the variable innovation with the individual entrepreneurial competencies of the students. Risk-taking and pro activity variables showed a low relationship with individual entrepreneurial competencies. The study allows concluding that the students perceive that the University has an entrepreneurial orientation and that they are attaining the necessary knowledge and skills to succeed in enterprise creation and development, but the emphasis is from the perspective of innovation. Risk-taking and pro activity behavior are aspects that the University must take into account intensively in order to develop better individual entrepreneurial competencies in students.

Influential Factors of the G2G Information Exchange in Puerto Rico and its Relationship with Electronic Government Initiatives

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Modest and reserved in its beginnings, concerns and fears associated with the transformation of the public sector in the implementation e-government platforms and electronic resources have dissipated gradually. The government has opened up to new mechanisms of governance, in order to expedite the provision of services to citizens, as well as to support internal agency procedures. As of today, most of the public sector has migrated their IT platform and information management systems as part of its strategy of technological expansion and incursion into the concept of Electronic Government (United Nations, 2012). However, there has been a stronger promotion of the Government to Citizen platform (G2C) than the Government to Government platform (G2G), which is conceived as the core structure that should support other government services. Despite efforts at the local level, the exchange of information between agencies has not been fully developed and implemented and suggests that the Government to Government component has not reached a level of maturity and adequate
interoperability to support complementary services of the e-government platform. The government itself, as a user of the data produced internally, should guide the efforts of the agencies in the same direction, without compromising the essence and particularities of their functions and capabilities in the advent of a common platform for information exchange. The research will focus on measuring levels of maturity, interoperability and strategies for information exchange in the context of Government to Government, as the main structure of the services provided through an e-Government platform. Nowadays, it has not been identified that the Academy or the same Government of Puerto Rico has made a study of this nature, posing a challenge for the researcher to construct the conceptual and empirical framework of the study from components associated with the topic applied in parallel scenarios. Government effectiveness in the interpretation and application of laws related to e-government, and proper management of the factors that influence the exchange of information between agencies is validated. The study will incorporate the perception of government employees in Information Systems and Statistics about the exchange of information in streamlining its processes, and its compliance with standardization and integration policies. After a slow process of data collection and follow up, the analysis of the results showed a particular behavior regarding the reliability of the instrument in particular topics that were expected to be stronger constructs. Recent studies associated with performance and reliability of electronic government services used Hair’s metrics to verify the reliability of their instruments. Given the possibility to consider lower reliability values according to Hair, the instrument of this study will also be considered under these metrics.

Technological alliance that contributes to the new generation's academic performance in higher education

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The objective of this qualitative study was to understand the integration and contribution of the technological alliance in the academic work of the new generation academic performance in higher education. This study is a qualitative exploratory research based on ECAR Framework (EDUCAUSE Center for Analysis and Research) as conceptual model. The techniques that were implemented included interviews with 15 students and 13 professors. The students were majoring in the areas of Business Administration, Natural Sciences, Education, Social Work, and Health Sciences. The methodology included interviews, nonparticipant observations, document analyses, and analysis of documents to collect information, such as the application of the method of triangulation of data (Okuda & Gómez, 2005). A content analysis was performed through the NVivo program where the information was coded and categorized. The results of the study identified the integration of 9 personal technological resources of students, 13 from professors, and 23 institutional that were available to contribute to the academic work of the students. The study also found that personal and institutional technology were integrated through the formation of the technological alliance which converge in four regions that include the use
of 45 elements of joined technologies to achieve 9 indicators of success for the academic work of the students.

**Intrinsic and Extrinsic Factors that Influence Consumers Behavior**

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There are some intrinsic and extrinsic factors that influence the consumers buying behavior. Both of these factors influence the processes of the search, selection and assessment of products in order to make the correct purchasing decision. The accelerated changes that customers experience by the impact of different factors of the macro environment such as the economic crisis or technology, affect the way consumers evaluate how to invest their money. This scenario represents a great challenge for today’s companies. The key is to understand when, where and how consumers want to invest their time and money. The main objective of this study is to identify the intrinsic and extrinsic factors that influence the pattern of the daily consumption. The qualitative study used a biographical diaries methodology to analyze the daily living of the consumer. The sample was of 930 people between the ages of 25-45 years. The biographical journal, were developed through a recorded interview where the consumer described everything he did during the day prior to the interview. The results showed that the intrinsic factors that drive the decision-making are: habit, limitation of time, brand loyalty, learning and definition of their need. Nevertheless, extrinsic factors that proved to be the driving force behind the purchase behavior are price influenced by economy, special offers and discounts, product (attributes and benefits), location of the establishment, word of mouth (WOM) promotion, variety and quantity of products and brands. The study confirms that time is listed as the centerpiece of purchase behavior based on the accelerated lifestyle in Puerto Rico. This accelerated lifestyle in all their daily activities makes consumer search constantly for fully accessible places of short distances to their home or workplace and where they are served quickly. The economy in contraction in Puerto Rico encourages consumers to seek how to maximize every dollar and perform a search for information to select the place where they can purchase those products that meet their needs and gain the most preferred brands at the best price. The study allows concluding that both the intrinsic and extrinsic factors are of great importance for the correct purchase decision.

**Leadership Style, Entrepreneurial Orientation and Innovation: the Impact on Business Performance and Competitiveness in Puerto Rico**

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The number of businesses filing for bankruptcies in Puerto Rico (PR) is more than four hundreds (400) per year, affecting the economy substantially. The rate of business failures requires leaders willing to make changes in business practices, particularly in Small and Medium Enterprises (SMEs). The purpose of the study was to determine the relationship between leadership styles, entrepreneurial orientation, and innovation and their impact on businesses competitiveness and performance in PR. Data collection was conducted through online surveys to a convenience sample drawn from members of the Puerto Rico Products Association (PRPA). The results of the study showed strong correlations between technical and administrative innovation, and moderate positive correlation of transformational leadership style with SMEs businesses competitiveness in PR, and showing that transformational leadership style is more appropriate to impact positively business competitiveness than transactional or laissez faire leadership styles. Multiple regression analysis revealed innovation and transformational leadership variables had a positive significant influence on organizational performance. One of the most important implications of the study is the importance of Innovation to maintain competitiveness. The positive relation and significant impact of administrative innovation suggest that organizations should evaluate their actual management practices and organization structure to implement the changes necessary to facilitate innovation processes. The study made important contributions such as; determining the impact between leadership styles or behaviors, entrepreneurial orientation (EO) and innovation on SMEs performance and competitiveness in Puerto Rico, and able to empirically corroborate theoretical notions from Leadership and Entrepreneurship Literature and their impact on competitiveness/performance.

**Competitiveness of Puerto Rico in the Commercial Air Transport**

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Airport Luis Muñoz Marin was the most important international airport in the Caribbean. Airlines like Pan Am, Lufthansa, Iberia, Lan Chile, Air France, British Airways, KLM and Virgin Atlantic, which currently are operating, came to Puerto Rico bringing passengers from around the world. This allowed for the Puerto Rican population to have viable alternatives, cost effective travel to overseas territory, like receiving flows of foreign passengers who arrived in the island. Currently, according to statistical reports and data provided by government agencies, Puerto Rico has lost significant competitiveness from 2005 to present. The objectives of this research is: 1) identify factors that impede growth and sustainability of air transport structure stable, limiting access to new markets 2) Assess the problem faced by commercial airlines to the limitations found. The study was a qualitative through a in-depth interview with the current administrator International Airport, Mr. Orellana and Ismael Vega, president of the Association of Hotels and Tourism. The results show that Puerto Rico has limited infrastructure, physical facilities, limited flight routes, transportation problems, mismanagement performance by government agencies, shortsighted global tourism market trends and changes in technology and the tourism sector (meaning, lack of equipment needed to handle aircraft with modern systems, efficient and compatible systems for new generation aircraft terminals), limited room for inventory, among others. Each of the above

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limitations or factors directly and indirectly affects the decision making of an airline to maintain its operation on the island or other, in entering the market of Puerto Rico. It can be concluded that in this scenario, Puerto Rico does not have enough capacity routes in domestic and international flights to facilitate entry and exit of air transport for passengers and service. Following this situation tourism in Puerto Rico is seriously affected by not having an optimal infrastructure for air transport and not provides the integration of sectors that provide goods and services to the tourism business. Degeneration and obsolescence of the commercial air transport limits the country to compete against a dynamic market with requirement, demand and changes that is constantly evolving.
Design and Architecture

Manifesto of TechCouturism

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In the new millennium a multiplicity of products and designers, experimenting inexhaustible possibilities of fashion and technology interaction, have emerged, e.g. Google Glass, CuteCircuit, Iris Van Herpen, Microsoft Pants, Lilypad Arduino, E-Textiles, Kinematics Dress. These creations, which include technological elements and fashion design concepts, have been categorized as “wearable technology” or “fashion technology”. The products/outcomes highlight a pronounced tendency in standing out technological features and an effort in researching last generation innovative technologies. This goes often to the detriment of fashion design. Although experimentations demand by nature freedom in employing methods and means, it emerges the necessity of clearly defining concept and principles of these new trends within the framework of fashion design. This historically developed according to specific criteria that set fashion design’s vision and interpretation about the combination of form and function. This way, it is possible to define the differences between device and apparel. This project aims to identify the basic criteria that should rule the integration between current/future technologies and fashion design to avoid that innovative elements overlap the essence of design. The process will be realized by: 1) a brief investigation on some of the Haute Couture top exponents (e.g. Chanel, Dior, Valentino and Gaultier), in order to create a profile with common characteristics. 2) An accurate analysis on the use and integration of new materials and means by esteemed innovative fashion designers of the 20th century (e.g. Paco Rabanne and Hussein Chalayan), in order to validate their integration strategy. 3) A study on top contemporary fashion technology exponents’ projects (e.g., Iris Van Herpen, CuteCircuit, Studio XO, Nervous Systems), in order to understand if and how this new fashion designers generation concern about, confront with and interpret the fashion design concepts. The preliminary investigation highlights a lack of sources, traditionally considered as reliable: i.e. books, journal articles, accredited theorists. Therefore, the researchers will use qualitative methods based on the interpretation of information acquired from the web and the blog stemplusd.com. In addition, interviews with top contemporary fashion technology exponents and visits to their workshops will be essential. The expected conclusion is the definition of a new fashion design concept, denominated “TechCouturism”. At the end, it will be edited the “Manifesto of TechCouturism”, which will describe the features that designs have to respect in order to be considered as accurate technology-fashion design integrations.
Reflecting on Modern Reflections: Specular Reflections of Glass and the Reconciliation of Meaning in Modern Architecture

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I am here. The space is compact, humid and white. My perception drives my gaze outward, towards the space outside of my own body. Outside, the rain showers the bodies of moving athletes jogging in the rubber surface of the track. What I am looking has nothing to do with what I see. In front of me, a pane of glass is showered with raindrops. I can see the athletes in the track, the glass pane; water in the glass surface and—the incomplete image of—my own reflection. Such distinct realities converge in a single surface: the glass window. The glass pane makes me aware; it makes me conscious. The reflection of the glass enables me to identify my own self in a deceptive transparency. It makes me revisit “multitudinous thoughts and feelings which pass through the mind” (W. James, 1890). The transparent panel opens the possibility of inhabiting all four dimensions: my inner self, the outside world, the reflected interior and the thin glass itself. I have always been fascinated by this effect. Modern architects were fascinated by this effect as well. This is a very modern effect, perhaps a very modern condition. This essay elaborates in the impression that, it is through glass reflections -specular reflection of glass- that early twentieth century architects reconcile the conflicting purging of meaning in architecture.

Collective Architectures: International Meeting in Puerto Rico

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The workshop Arquitecturas Colectivas study local and possibly transient design and build proposals in the community of La Perla in Old San Juan. The participants [designers, students, volunteers] work in the public sphere as scanners from where sequences of implied networks and relationships are constructed. In the scanning operation public spaces are put in dialogue through the subject; the community of La Perla. The network questions the nature of architectural practice involving forty students from the three architecture and design schools in Puerto Rico; Polytechnic University of Puerto Rico, University of Puerto Rico School of Architecture, Pontifical Catholic University of Puerto Rico and the School of Visual Arts in Old San Juan, three international designers [Todo por la Praxis from Madrid, Spain, Arquitectura Expandida from Bogotá, Colombia and FG Studio from New York City] in the process of participation and self-managing empty spaces in urban contexts. The significance of the projects is not the end result, but the process itself. Although the projects are temporary insertions, they act as urban prostheses in deteriorated spaces of social encounters within the community. The “urban disobediences” organized
through collectives, volunteers and students construct new “situations” to be added in unfinished urban cartographies. They are fragmented scenes of a community seen in frames, where each intervention becomes an event that forms part of an experimental urbanism, one that traces notes about urban practices. For example, *Luigi’s Stair* in the sector of *waipao*, of La Perla is an intervention that the students built on the beach to recuperate the access to the water. The project included the help of local surfers, children’s from the sector and the collective Arquitectura Expandida. Through interviews and presentations to the community, materials selection, budget definition and a design *charrette* the students design and build three interventions. Each project emphasizes in the recycle of materials and the reoccupation of deteriorated spaces. In conclusion, the design/build workshop demonstrated to be an effective pedagogic investigation of architecture’s social responsibility.
Educational Leadership

Perception of Bullying and Places of Incidence Between Two High Schools in Puerto Rico

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The objective of this quantitative study was to compare the perceptions related to school bullying between two public high schools. Both schools are located in urban areas in Puerto Rico – one from northern Puerto Rico and the other from southern Puerto Rico. The perceptions of school bullying and places where they took place with students, teachers, principals, were collected through the administration of a questionnaire. Results of the study indicated that there is no significant difference between the perceptions of harassment in students, teachers and principals when comparing the high school in the north, with the high school in the south. Additionally, students and teachers identified the classroom, hallways, and school yard, as the areas where the highest frequency of school bullying occurred.
Educational Strategies and Learning Environments

The Teaching of English in Puerto Rico

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The last decade of the 19th century, and the start of the 20th century, brought many changes to the island of Puerto Rico. Among the changes that took place in Puerto Rico was the intensified use of the English language once the American military took possession of the Island. This change sparked the beginning of an extensive and continuous resistance towards the English Language from the citizens living on the Island. Discussions on how the changes in language policy and the medium of instruction for the teaching of English in Puerto Rico have evolved from the period of 1898 to the present will be addressed.

The Success of Bilingual Education in Puerto Rico's Public Schools

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For more than a century, English has been seen as an imposition to citizens living in the Island who have fought to maintain their Spanish speaking heritage against all odds. However, when English became the second official language, bilingual schools began to flourish throughout Puerto Rico to expose English language learners to an ideal environment where they can learn the English language while enriching their first language. After nearly two decades of implementation, the Bilingual Citizen Project is evidently successful in promoting bilingual citizens among the students enrolled in these schools. The factors that make these schools successful will be presented and recommendation for future success of bilingualism in the Island will be discussed.

Curriculum Design using Alternative Education

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The purpose of this research was to elaborate an innovative curriculum design for the teaching of Spanish to middle school and high school students with alternative education. The designed is based on...
a previous research study that evaluated the viability of integrating an academic and recreational curriculum of an academic summer camp for middle school students that came from low socioeconomic backgrounds. Throughout a mix design, I made observations of the teaching process, evaluation questionnaires to students, two focus groups of five students each and an interviews to the five of the participating teachers. Results showed that this integration is possible because both students and teachers enjoy the learning process, which was more authentic and significant than the traditional education because it involved games and recreational activities. Also, this curriculum design follows three philosophical principles: the transdisciplinary of knowledge and therefore teaching, education based on emotional and social development and education defined and exposed as a liberating process for student empowerment in a democratic society. The core of this Spanish curriculum is the teaching of applied linguistics instead of traditional prescriptive grammar to explore the linguistic intelligence among students. Finally, this research study also describes an implementation process that must be upheld, in the social context of Puerto Rico’s Public Education System, to make a successful integration of this alternative curriculum for all students.

A Review on Demonstration in Euclidian Geometry: a Case Study

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This study is presented as a qualitative research aimed at characterizing the concept of mathematical demonstrations, and in particular, geometric demonstrations in Euclidian Geometry, by math professors of student candidates to become teachers of math at junior high and high school level in a private university. This research is an intrinsic study case, and the main purpose was to study in depth the conceptual understanding of the concept framed in its context. The participants were three Faculty members at a private University in Puerto Rico, who have taught or are teaching math and/or geometry to students who are candidates to become math teachers at junior high level. This study concludes that at a disciplinary level there are two mayor elements that characterize the demonstration process: a) the axiomatic framework and definitions; and b) formal logic. At a didactical level certain elements were identified: multiple representations and the use of mathematical language were fundamental in contributing to the development of the ability to demonstrate in Euclidian Geometry.

Bilingualism: 21st Century Impact on Puerto Ricans

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Today’s global society presents many benefits and challenges to Puerto Ricans in achieving bilingualism. Among some of these factors are the political and pedagogical practices in the US and Puerto Rico, which help or hinder this population’s first language (L1) and second language acquisition (L2).
Consequently, current research and best practices that promote bilingualism are examined. Additionally, bilingualism, as it is impacted by Puerto Rican migration, to and from the US, will also be discussed.

**Phenomenological Study of Mathematics and Science Integration by K – 6 Teachers**

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The qualitative study of "Mathematics and Science Integration", was developed through five teachers at the elementary level of the DEPR, participants in professional development programs and whose main focus the integration at the classroom. This served two aspects: (1) the correspondence between the expressions of teachers and their practices and (2) what level of integration correspond to educational practices. The proposal of subject integration in the educational field comprises different levels and ways of linking more than one discipline. Educational excellence requires the promotion of curricular programs based on cross disciplinary research and a socially articulated knowledge base. The results showed that teachers who work integration as the education strategy can achieve student learning of the disciplines that are linked to the process. In addition, teachers manage and develop the first level of 'multidisciplinary' integration into their classroom. However, those teachers who manage a second level 'interdisciplinary' integration developed a educational methodology that addresses the disciplines with a mathematical and scientific discourse. It is expected that work, and promote studies in the field of curriculum integration serve for the teachers and future teachers of Puerto Rico modify their educational practices according to changing educational paradigms and the XXI century
Energy and Clean Technologies

Synthesis and Characterization of Cobalt and Iron Catalysts for the Production of Diesel

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Currently, energy nonrenewable sources or fossil fuels are used as the major energy resources. Fossil fuels are about 70% sources of primary energy, generating important pollution problems because these fuels contain sulfur and nitrogen compounds which, during combustion, generate sulfur dioxide and various nitrogen oxides. The rise in price and demand for fossil fuels, made necessary the search for viable technologies for the production of clean liquid fuels with high commercial value. A possible source of clean liquid fuel is the diesel, which has relevance for sustainable energy. One of the most viable processes for the production of diesel is the Fischer-Tropsch (FT) mechanism, which uses synthesis gas (Syngas, a mix of CO and H₂) obtained from renewable energy sources. The FT synthesis produces a mixture of linear hydrocarbons of high molecular weight and high purity having a high variety of applications, including pharmaceuticals, cosmetics, etc., and especially the obtaining of synthetic fuels, such as gasoline and diesel. The diesel fuel obtained by the FT process is characterized by having superior properties with respect to that obtained from petroleum distillate. The objective of this research has been the synthesis of new catalysts for FT reactions based on spherical SiO₂ particles. These silica particles are obtained using the method of Stöber-Fink-Bohn (SFB) and subsequently impregnated with the metal species (cobalt or iron). The resulting materials, with different metal compositions, are promising catalysts for diesel production using CO and H₂. The synthesized catalysts were characterized by Scanning Electron Microscopy (SEM). As a result the cobalt catalyst showed the best particle homogeneity. The particle size, based on the average of the diameter was higher compared to iron-based catalyst. The particle size and distribution are considered relevant parameters that can be correlated with the expected surface area of these materials and then with the efficiency of the synthesis of diesel by a FT reaction.

Process Analysis and Tools Development for ACT Global at Puerto Rico Energy Center

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ACT Global at Universidad del Turabo will help entrepreneurs develop their businesses in order to generate economic activity in the island of Puerto Rico. To support these activities, e-trainings related to operations improvement were created and published using Google Docs. The trainings created focus on the topics of Project Management, Lean Six Sigma, Lab Safety & Error Prevention and ISO 50001 related to the Energy Management QMS. These training are available on demand and can help any interested entrepreneurs in enhancing their knowledge and increase the competitive advantage of their companies. To enhance material comprehension and understanding the trainings were developed considering Bloom’s taxonomy, and principles of error analysis. E-quizzes were created to promote material comprehension and also published online, with successful completion of these earning a certification. The research will present the design considerations to create the training objectives, teaching materials and quizzes based on the recommend design principles.
Social and Human Sciences

Mafalda and Friends: The Cartoon as Social Criticism

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Social criticism has existed all through time and has been present in radio, theater, movies and comics. Just like that, in 1964, by the hands of Joaquín Salvador Lavado, best known as Quino, Mafalda and friends were born. With a critic mind to their surroundings and their life, this group of friends goes through the streets of Buenos Aires, Argentina asking everything they can to fill the empty spaces caused by their concerns. Middle class families with every type of disparities between them make this comics part of the Argentinian society culture. This characters show ideological differences very rich and particular, every one of them go to preschool but not all of them have the same line of thought and ideals in education, politics, family or the future. Mafalda and friends compose the children sector of the Argentinian middle class of the sixties and seventies that debate what they think is right and ask everything so that they have a better future in their society, rather than conform. The ‘what has been’ of this group of friends is unknown, although it is speculated. Even so, this group keeps on being part of an always changing society that keeps on committing the same mistakes over and over again.

When Gender Norms have Criminal Consequences: Women in the Penal Code

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A human rights reading of the Puerto Rico Penal Code is a pretext to analyze how the criminalization of women materializes into situations of precarity, dispossession and violence. Through the analysis of typified conducts and women-profiling through criminal law, this paper intents to expand an urgent discussion about the allocation of sexual politics and gender norms within the justice system, unveiling the subjacent premises that underline the systematic punishment of women and that are closely linked to various forms of occupation. Also, this paper intends to conceptualize the impact of the Penal Code in the public perception of women and the access to basic human rights such as health, housing and justice.
Authorship and Reception: Towards a Hermeneutic Approach to the new philosophy

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This research explores the polemical authorship of a 16th-Century scientific text through a hermeneutic approach focused on a unique issue of gender. Published in Madrid under the authorship of a women called Oliva Sabuco, but later claimed by her father Miguel Sabuco, the Nueva filosofía de la naturaleza del hombre (1587) has given rise to multiple readings marked by its author's gender. The possibility of the female authorship of the Nueva filosofía deserves a careful evaluation of her scientific discourse as a field dominated mainly by men. Meanwhile, the possibility of its male authorship under the mask of a woman implies a reading of fertile literary overtones. The reciprocity between author, text, and reader is the main premise of this study on a treatise that proposes, from a textual female voice, a modern psychosomatic approach to human health. Spanish Golden Age texts need to be particularly read between the lines and from the scope of a heterogeneous culture where ambiguities strongly underlie literary production. This work opens the interpretative possibilities of a scientific text fissured by an ambivalent authorship and its multiple readers.

On Your Marks, Get Set, Learn!!!

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During the past five years, in the Centro de Lectura y Redacción (Reading and Writing Center) at Universidad del Turabo we have been trying to find new ways to help peer writers. We look for ways that will help them succeed in their written communication and, at the same time, learn something new. In that search we have asked ourselves a lot of times, how can we make this learning less dull and more entertaining? Last year, while preparing our presentation for the 2013 NCPTW, we came across a theory presented by María C. González-Pellizari-Alonso. She explained how the learning process can be taught through games and how this can change the students’ attitude towards learning in a positive way. She also stated that by changing their attitude and sharing with those students a new set of skills; we enable them to enhance their studying habits. While reading about what González-Pellizari-Alonso calls “ludic teaching”, some of us remembered that when we started to work as mentors at Centro de Lectura y Redacción in 2009, professor Phillip Murray showed us how he imparted his students a lesson about English grammar with a Jenga game. At that time we found it a really interesting and interactive way to teach students who were struggling with the English grammar important grammar skills that would enable them to communicate more effectively in English. Last year while we were at the conference, we saw that the 2014 topic was about imaginative things that we are doing in our centers. Right away we remembered Professor Murray’s use of games, and we started thinking about how to integrate play in the writing center. What new ways we can use to teach old thing? What games can we integrate in the
center to make it more fun and interactive? How a game-based writing consultation compares to ordinary consultations? What types of consultations can be transformed into games and which ones cannot? Taking all these questions into consideration, we plan to prepare a workshop in which we can show how to implement “ludic teaching” to different topics that we discuss in our centers as part of our consultations. We would also like to have a friendly discussion about what other centers are doing to spark creativity and imagination in the learning process. We will be showing some of the activities we have developed in our writing center so that other writing centers can apply them and hope to learn new activities implemented by other writing centers through our discussion. In this workshop we will be discussing how games can be integrated into our writing consultations and how can they be a tool for peer writers. We will discuss “ludic teaching” theories and how to put them into practice in writing consultations. As part of the workshop, the participants will have the opportunity to experience those games first-hand and express their opinions and suggestions. Don't miss this opportunity! Come play, talk and learn with us!

Adaptation and application of a Psychodrama model for depression in college students in Puerto Rico

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“The man was wounded in society and should be healed in society”. The Psychodrama model explores the psychological and social problems, using methods of action rather than verbal. Today Psychodrama is applied in various scenarios such as health, prevention, psychotherapy, pedagogy, organizational development and research. Jacob Levy Moreno, Austrian psychiatrist, developed the model inspired in his “theater of spontaneity” and researches on social interactions. Recent studies revealed a high incidence of depression in Puerto Rican adolescents. In the United States and Latin America other studies show a greater increase in depressive disorders in late adolescence and college students. Psychodrama research showed improvement in depressive disorders and individual wellbeing, inclusiveness and rehabilitative effect, and the increase in social skills of children and adolescents. This study evaluated the effect of psychodrama in reducing the criteria for depression in college students in Puerto Rico. We adapted Dr. Bloom’s trauma focused-trauma sensitive SELF method to the classical Moreno’s Psychodrama. The SELF structure promotes the development of security, emotional management, loss acceptance and future projection. The mix study, worked in a pre-test post-test modality applying the Beck Depression Inventory (BDI). The group selected criteria presented by availability from non-depressed to moderate depression according to Beck Depression Inventory (BDI). College students were exposed to ten sessions of psychodrama. During the therapeutic process sociometry techniques such as action sociograms, social atom, were used to qualitatively measure changes in social dynamics, mood and evolution of the criteria for depression. Some techniques were applied, guided imagery, re-experiential trauma drama, bioenergetics, family sculptures, behavioral rehearsal and re-matrixing social atom. The findings suggest the reintegration of the individuals, the development of new social skills, sense of well-being and improved self-esteem, as well as reduction in depression criteria in every single participant. The post-test revealed a significant reduction in
depression criteria as in the Beck Depression Inventory. The research findings suggest psychodrama, as an effective therapeutic tool, easily implementable in clinical, organizational, pedagogical and social scenarios. If the theater is by definition the representation of human beings and their circumstances, then in Moreno’s words, "in the theater can be ourselves".

A Living Language

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The "Instituto Cervantes" is a public institution created by Spain in 1991 to promote and teach the Spanish language and the co-official languages, and to disseminate Spanish and Latin American culture. It is present in 90 cities out of forty-three countries in five continents. The objectives of the Institute are to organize general courses of the Spanish language, spread it and its culture. Another objective is to provide information using the most renovated technology. Annually it performs a report informing the latest data of our language. As well as the Cervantes Institute, our research, aims to publicize the contributions that made this on the Spanish language. We will disclose data that place the Spanish language as the second universal language. We will also promote the appreciation and value for the language and make reflection on the future of the same. We will achieve these goals through reading, analyzing and reflecting on the latest report of the “Instituto Cervantes”. Statistical data give foundations the offered information. It is important to know our linguistic culture and promote it to keep a living language.

Unpoliticized Beauty: the Pre-Raphaelites in the Caribbean

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The Museo de Arte Ponce has one of the largest and most comprehensive collections of Pre-Raphaelite art in the western hemisphere. Home to Leighton’s Flaming June and Burne-Jones’ Sleep of King Arthur in Avalon, the southernmost municipality (and the rest of the island) have integrated this English school of artists into popular culture, essentially co-opting these cultural objects. While Puerto Rico has a continuing story of colonial subjection between Europe and the United States, political relationships with England have been limited to plundering in the 17th century. On the other hand, while the Pre-Raphaelites and their disciples have orientalized the east as well as re-imagining the past, painting and writings on the West Indies are scarce if not non-existent. The Caribbean as a political and cultural space had been a topic of interest in Victorian publications and novels (consider Jane Eyre) but apparently its connection with Pre-Raphaelitism is hardly studied. This paper pretends to explore the historical relations of the brotherhood with Caribbean (did their patrons had a stake in the businesses of Jamaica? Who where their black models?), as well as, their cultural implications in the island as well as the history of the MAP’s collection. This research expects to benefit two different academic fields: cultural Caribbean studies as well as the burgeoning interest in Pre-Raphaelite art and poetry.

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Landowners and Business Owners in the Oriental Region of Puerto Rico: A Historiographical Analysis on Power Relationships

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The following research will examine the historiography and the oppositions of different researchers on the power relationships between landowners and business owners in the oriental region of Puerto Rico during the 19th century. Furthermore, it will present an analysis of the historiography of the oriental region of Puerto Rico and provide evidence that will contrast with the work carried out by other historians on the subject. This study presents diverse manifestations of the elite sectors in that region.

Metaphorical Thought in Curse Words within the Spanish Language

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Curse words within the Spanish language vary depending on geographical factors, social acceptance and certain aspects intrinsically related to the Spanish speaking community. Words that may be considered vulgar in some regions could be voices of everyday use in other countries. Similarly, terms of everyday life in some countries may be perceived as distasteful in certain regions. We shall explain this phenomenon based on the underlying metaphorical schemes in the minds of the speakers. Likewise, we will analyze different etymologies and semantic variations of some of these words throughout the ages.

Juvenile Sexual Offenders: Psychosocial profile and judicial intervention in Puerto Rico

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The population of minors in Puerto Rico is considered amongst the most complicated individuals in society when it comes to their psychosocial, behavioral, disciplinary, educational and moral aspects and characteristics; that are due to the diversity in their age range. The questioning of calculating the odds of becoming a victim of a crime that derives from violence is one of the reasons we push this investigation forward. Furthermore, a psychosocial profile will be provided to establish the reality amongst the many elements, facts and stimuli that may provoke these behavioral deviations and wrongful individual characters in their early stages of development. By knowing how to identify these elements we will be able to make the corresponding approach during a judicial intervention with a Juvenile Sex Offender.
Nevertheless, we must keep into consideration that not all Juvenile Sexual Offenders understand the magnitude of such eradicated behavior or even the fact that it may be or not considered a crime – depending on the geographical location. Many jurisdictions consider it to be a “cultural or social problem” or even a taboo. Therefore, it is by breaking those cultural taboos that this could be considered one of the first, if not the first, descriptive investigation that will actually lead us into understanding “how” and “why” these individuals become sexual offenders and how to identify the possible ‘symptoms’ and conducts.

**Female Genital Mutilation: Mutilation of Women’s Rights**

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The goal of this project is to learn more about female genital mutilation. In this investigative work we will expose clear, concise and encompassing information about ablation. It is essential to give a definition that includes all the concepts used in this practice. Moreover, we will see the different types of mutilation, their respective explanations and the short and long term consequences. Our work will be substantiated with real testimonies and research. Even more so, we will offer statistics from countries that still practice it, and those that do so at a lesser scale.

**A New Heroic Figure: Female Protestors in Puerto Rico**

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This paper offers a critical look on an isolated, failed incident of protest carried out by a young Puerto Rican woman and her two children. In doing so, it explores the possibilities of radical political thought and action on the Island. Furthermore, by situating this event within the larger context of danger—physical, social and discursive—that women in Puerto Rico are subjected to, it seeks to question the manner in which female protestors’ vulnerability and agency challenges those on the left to formulate gender progressive strategies for emancipation. Lastly, it is argued here that this protest features a new type of radical political subject on the Island, that could very well serve as a figurehead for large scale social movements arising from a shared sense of precarity.

**Historiographical Approach to 19th Century Sugar Industry: Juncos Case**

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In the following study I analyze the historiography on 19th century sugar plantations with the purpose of commenting the contributions of historians on the subject. Researchers who have studied this historical period have narrowed their focus to the description of the relationship between sugar and slave labor, the boom and decadence of the sugar factory, and the use of technology in this industry. Furthermore, they have analyzed those processes using mainly the southern region of Puerto Rico as the object of their research, and have left at the margins other regions of the country. For that reason, I will examine the oriental region to analyze the development of the sugar industry in the municipality of Juncos. Lastly, I will describe the methodology, the sources that were consulted, and the main findings of the study which allowed me to reconstruct the history of 19th century sugar industry in Juncos.

The Representation of the Jíbara in When I Was Puerto Rican and Con valor y como dé lugar: memorias de una jíbara puertorriqueña

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This presentation offers an overview of my research on the topic of the representation of the jíbara in the autobiographical texts: When I Was Puerto Rican by Esmeralda Santiago and Con Valor y Como Dé Lugar: Memorias de Una Jíbara Puertorriqueña by Carmen Luisa Justiniano. Since the nineteenth century the topic of the jíbaro, has been present in Puerto Rican literature and even today it continues to permeate many aspects of both island and mainland life. The Puerto Rican literary landscape is full of jíbaro characters that have principally been appropriated and represented according to the interests of male elite authors which more than often stereotype the jíbaro’s true existence. Even more so, the jíbara discourse has been hugely silenced and underrepresented and it has been portrayed in relation to the jíbaro or other male characters. That is why the texts of the corpus, immediately called my attention. These two Puerto Rican women writers not only choose to call themselves jíbaras, but license the jíbara as the subject of their autobiographical narrations.

Researching in Social Science

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The presentation will be focused in the experience in researching in the social science class in the Universidad del Turabo, Gurabo, Puerto Rico. I will talk about the importance of the investigation within the curriculum of both SOSC 111 and SOSC 112. I pretend to discuss how students can develop some researching, focusing in the social problems in their communities, as a topic of the class analysis.
Intervocalic /d/ Deletion in Dominican and Puerto Rican Spanish

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This research examines qualitatively and quantitatively the intervocalic /d/ deletion, one of the oldest linguistic phenomena that have been documented and one of the most widespread in the Hispanic world. The aim of this study on phonological variation is whether speech communities of the Dominican Republic and Puerto Rico show dialect differences, or if the presence of certain variants is distributed in the same way and the only observable change is due to social factors. The corpus comes from 32 semi-structured interviews with native speakers in metropolitan areas of Dominican Republic and Puerto Rico. The representativeness of the population is established by sociological factors: gender, age and education. Data were analyzed probabilistically with SPSS and Varbrul. Moreover, Optimality Theory is used to determine the optimal candidate from each of the hierarchies of restrictions dialect zones.

Reflexions about Immigration in Puerto Rico during the XIX Century

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The nineteenth century has been one of the most studied periods by the Puerto Rican historiography. In spite of this, issues such as immigration have been confined to certain sectors. The majority of the studies about the immigrants in the nineteenth century are used as the backbone for the construction of the Puerto Rican identity. Behind this historiography, it’s evident a tendency to "protect" and "frame" the construction of the Puerto Rican identity pointing toward Europe, America and the Caribbean. However, with this research i want to demonstrate that the matter of the identity of the Puerto Rican is more complex than what has been proposed up to now.

Historiography About the Modernization of Puerto Rico During the 19th Century

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Every historiographical exercise has as an objective the analysis of how historians have approached historical processes. That allows us to determine which subjects and focuses require attention. The following historiographical exercise does precisely that. It analyzes the research about the modernization of Puerto Rico during the 19th century. Historians focused their research on the technological progress in sugar and coffee plantations, and the possible external and internal factors that influenced the modernization of these productive units. This allowed me to open up new research
about the modernization phenomena in other contexts such as municipal administrations –city government– in the last three decades of the 19th century.

**Puerto Rican Diasporic Literary Production in the United States**

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In order to study the literature created in the Puerto Rican diaspora, it is necessary to understand the historical process of Puerto Rican migration to the United States. This diasporic experience has provided the space to create literary expressions that have occurred in specific historical circumstances and the retelling of the migratory process is essential to situate and comprehend these writings. The Puerto Rican diasporic experience of displacement has influenced and been essential in creating cultural and artistic expressions within the Puerto Rican diaspora and this literary production parallels the historical phenomenon of migration. Therefore, the following study traces the development of Puerto Rican Diasporic Literary Production in the United States from the late 1800s to contemporary times.

**The Guánica Central in the Ensenada Village. Preliminary Study of the Impact of its Closing on its Workers and Settlers**

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This study analyzes the development of a company town that emerged as a result of the economic progress of the Guánica Central after its foundation during the beginning of the 20th century. The main focus of this investigation is to identify the sociological impact of the Central’s closing in 1981 and the consequences of this process on the population. This situation deteriorated the socioeconomic conditions of this settlement and the Guánica municipality, impacting all areas of the social and economic life of Ensenada, with emphasis on the deterioration of its infrastructure and ultimately causing migrations of its population. The oral historical method is utilized in this study. Previous employees of the Central who were affected by its closing gave their testimonies and participated in this event.

**What Factors Facilitate Good Learning Experiences in Clinical Studies in Nursing: Bachelor Students Perceptions**

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Clinical studies constitute 50% of bachelor program in nursing education of the majority Bachelors' degree programs in nursing. Clinical studies in nursing education are reported to represent one of the most stressful parts for the students, particularly in the initial period due to lacking competence and knowledge. Regular feedback, reflections, and practical advice from the supervisor are some of the most important factors that others studies have found to be important for improving students practical competence, confidence, motivation and self-esteem. The aim of this proposal is to explore what bachelor students in nursing perceived to be important for having good learning experiences in clinical studies. Data is plan to be collected in a focus group interview with at least eight to ten students in the last year of the educational program. The interview is plan to be transcribed verbatim, and qualitative content analysis will be used for exploring and interpreting the content of the interview text.

Social Media and Cyberbullying: Allies or Enemies?

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Cyberbullying is usually associated with the use of Internet and social media platforms in a negative way. However, we cannot blame social media as the cause of growth in cyberbullying. The issue lies in how people use the technology for doing harm or for doing well. Our work argues that social media could be a positive communication platform for educating and preventing regarding cyberbullying issues. Therefore, this work has the purpose of discovering and analyzing the use of Twitter in the communication of messages regarding cyberbullying. A content analysis was performed to 300 public tweets (messages on Twitter) that contained the hashtag (#) or word “ciberacoso” (cyberbullying). The analyzed tweets were sent during a four month-period from different Twitter users. Categories for the analysis included: type of Twitter user (media, companies, universities, etc), purpose of the tweet (information, communication, and participation/action), among others. In addition, a sentimental analysis was carried out in order to discover if the tweets were positive, negative or neutral. The intercoder-reliability reached was .97. Results indicated that along the four-month period, informational tweets (one-way communication) were more prevalent rather than messages that promoted communication and participation/action. However, among those tweets that stimulated participation/action, the majority of them promoted prevention of cyberbullying. Overall, the tweets had a positive tone. These results indicate that people are being awakened in the use of social media for the communication, prevention, and education of cyberbullying. Therefore, we need more studies that could continue discovering more patterns in the “traces” that social media is giving us for the analysis of cyberbullying behavior. Additionally, the majority of the tweets were sent by media companies. This shows us how the media is playing a positive role. Instead of spectacularizing the problem of cyberbullying, they are promoting positive behavior and education in order to stop it. This is especially among teens and young people. Social media, hence, could be an ally in the prevention and education of cyberbullying.
The use of Facebook as a Communication Tool in the Puerto Rican Company Scenario

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Social media is a powerful tool for companies who wish to design better products and services based on the reviews and opinions of their fans and customers. This means that companies are using the element of feedback and interactivity in order to improve their products and services. We are living in an era where instead of encountering passive consumers, we are surrounded by proactive prosumers with strong opinions and reviews about everything. In the last years, there has been an increment of companies taking care of their online presence and listening and engaging with their fans, customers, and influencers, especially in the United States and Europe. However, is this scenario also presented in Puerto Rico? Are Puerto Rican companies using Facebook for informational or communicational purposes? What are they really communicating and informing to their customers? This work analyses how the top 400 locally owned companies of 2013 (published by Caribbean Business magazine) are using Facebook as a communication tool. A quantitative content analysis is being performed to companies that present active pages on Facebook. A total of 128 companies were encountered with active profiles. This means that active companies are the ones that have posted during the last month at the moment of doing the data recollection. All posts published by these 128 companies during a three-month period (October-December 2014) are being analyzed. Criteria for this analysis include the topic of the post (news, marketing, events, charity, etc) and the purpose of the post (information, communication, and action). Other categories are also being analyzed. Previous studies have found that Facebook was used among Puerto Rican companies for pure informational purposes where the majority of the posts were focused on marketing (discounts, promotion of new products, etc). However, from 2011 to 2015 there has been an increment of 481% on active companies on Facebook, from 22 active companies in 2011 to 128 in 2015. We expected to find that more Puerto Rican companies have awakened to the importance of using social media for the purpose these social platforms were created: to generate conversations and empower prosumers.

Lives of Women: Between Submission and Subversion: From Ancient Greece to Seventeenth-Century Spain

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Our work studies the development of the social and cultural conception concerning the woman who has come up to us. For this we have selected as the center of our study the development of women’s lives from ancient Greece to seventeenth-century Spain. On occasion we will contrast the aspects studied with women’s realities in other parts of Europe. We will start with the ethical-philosophic-religious debate, misogyny versus defense of women, which occurred throughout these centuries, given that this

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debate undoubtedly influenced the treatment of and the place assigned to women. We continue with an overview of women’s lives in ancient Greece and Rome. We move on to the middle Ages, giving way to the Renaissance and the Spanish Baroque in which we look at the development of the woman in the family environment: the maiden, the married woman and the widow. We also look at women who led religious lives: nuns, Beguines and the devout. We also look into the lives of women on the margins of society: witches, sorceresses, prostitutes and delinquents. We will conclude with studying the contribution of women to the economy of the family and society.

_Dogs of Paradise: a converted Jew after the Garden Eden_

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In _Los perros del paraíso_, Abel Posse performs a rewriting of the _Diary of Christopher Columbus_. The novel represents an inversion of the conquest image: the recently discovered continent is seen as a rational thinking space while Europe is classified as the place of the magical thoughts. Posse makes use of a lot of linguistic, historical and ideological anachronisms to rewrite the past. Our investigation approach is an intertextuality exercise following Gerard Genette theory regarding the hypotext text (primary text) and the hypertext (elaboration or redoing of the primary text) to examine the relationship between the historical and literary discourses.
Revisiting Acceptability Judgments: Anomaly Detection and Metalinguistic Performance

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Intuitive judgments regarding the acceptability /grammaticality of sentences have been the prevalent method of data gathering for generative linguists since the late 1960s. With growing rigorousness in investigative methodology, and in spite of some important substantive and methodological objections, judgment studies continue to add to linguists’ store of knowledge regarding the relative uniformity of competence, i.e., that tacit knowledge of language that exists in the form of linguistic intuitions about dimensions of language such as paraphrase, ambiguity, and grammaticality. Important studies have focused on the development of metacognitive or metalinguistic skills in children i.e., the introspective ability to observe language as an object in itself. Notably few studies of this type have been conducted with adult subjects. A two-part study (original and replication) on detection and explanation of semantically anomalous sentences by highly educated bilingual adults (Spanish L1, English L2) is reviewed and analyzed. Results point to the variability of adult behavior in metalinguistic evaluation tasks, and the difficulty in predicting results, even when the subjects chosen possess an obvious degree of linguistic sophistication due to their bilingualism and their high levels of academic accomplishment.

The interpretation and the implementation of Act No. 54: the experience of faith-based and feminist nonprofit organizations.

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The purpose of this study was to examine the interpretation and implementation of Act No. 54 from the understanding of law makers, and of those women who are administrators and professional social workers of faith-based and feminist perspective, Non Profit Organizations that offer services to women victims-survivors of domestic violence. In this investigation I used as a conceptual framework the gender perspective based on a social constructivist paradigm and the qualitative methodology as a research approach. The semi-structured interviews have allowed me to gain access to the understanding of the thirteen participants of the study. The information that was compiled was analyzed using the method content analysis. It was concluded that the high rate of domestic violence against women makes the Non Profit Organizations necessary due to the absences of a manifest will of the government in the search for responsive and effective alternatives to the situations of domestic violence toward women. The understandings of the sectors involved in this study reveal a direct relation between the interpretation and the implementation of Act No. 54, and these conceptions have two manifestations: first of all, an individualistic interpretation and secondly, an institutional-structural interpretation. Each one of the interpretations manifests themselves in different approaches as to the attention of the
necessities of women who have survived domestic violence. Because there is this relationship, it is necessary to transform the imaginary of the problem and as a consequence the framework for action.

**Mexican Muralism in Latin America: Diego Rivera, José Clemente Orozco, David Alfaro Siqueiros**

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The Mexican revolution was a socio-political movement from early 20th century that looked to put end to the Porfirism dictatorship that governed Mexico for over 31 years. The Mexican Revolution was the greater social and political movement in Latin America during the twentieth century. Returned his voice to the Mexican people, gave rise to the lifting of a number of ethnic and labor organizations that would result in significant changes in the social structure. Muralism is a product of a series of social and political struggles. Muralism was the most visible product of Mexican Revolution, an artistic movement which main goal was to educate the people through art. The government patronized the artists providing them the tools to accomplish their artistic work; the only requirement would be that their work should carry nationalism. The Muralism was the most productive artistic movement, projected Mexico and helped to spread the national identity, which before that seemed lost. It also became a different way of telling the history, a public education project that brought art to everyone. Artists such as Diego Rivera, José Clemente Orozco and David Alfaro Siqueiros were the bearers of the vision of José Vasconcelos "New State". Within the mural there was the presence of female representatives, not so much popularity and relevance as the artists of the opposite gender, but that made their way in a male-dominated society thought. Throughout this research it is analyzed the social and political context in which the Mexican Revolution developed, the Muralism beginnings, characteristics, main exponents and their artistic work, female participation, international exposure, historical and cultural legacy and actual state of Muralism.

**The effect of using the strategy of an electronic platform in the level of implementation of the argumentative written submission of freshmen students in Basic Spanish courses in a private university**

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The purpose of this research was to determine the effect of using the strategy of an electronic platform in the level of implementation of the argumentative written submission of freshmen students in Basic Spanish courses in a private university. The theoretical framework that supported the study was: Vygotsky's Sociocultural Theory (1979); Salomon's Theory of Distributed Cognition (2001) and the Writing Model of Bereiter & Scardamalia (1992). A quasi-experimental design with a mixed approach
was used. Participants were two groups of students in their first year of a course in Basic Spanish. The research instruments were a pre-test, a post-test, and a rubric for measuring the implementation levels of the participants. Two methodologies were used: the first was based on the traditional teaching of the subject of written argumentative communication through an educational module to work it in manuscript; the second, an educational module integrated in an electronic platform to be performed in a laboratory. Descriptive measures were used with a significance level of 0.05. The results of this study revealed that: The electronic platform suggested to be an effective strategy to the development of argumentative written communication; students who used this electronic platform reached higher levels of performance. The product assessment developed by the students under treatment indicated a higher level of performance, as compared with the traditional methodology.

**Correlation between Visual Motor Scores of Development and Perceptual Reasoning in Puerto Rican Adolescents**

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The importance of using the right tools is an integral part of the psychological evaluation, the purpose of this researcher is to conduct differential diagnosis responsibly. It is understood that a misdiagnosis can harm the cognitive development of adolescents. This study aimed to correlate the test scores of developing visual-motor and perceptual reasoning index in a sample of adolescents in Puerto Rico. The research question was, will there be correlation between the test scores of the development of visual-motor integration of VMI and sub tests of perceptual reasoning index (IRP) of the WISC IV in a sample of Puerto Rican adolescents? For this research a quantitative methodology (Pearson correlation) was used. The sample was for availability, 45 cases of Psychological Services Clinic of a private university in the country were used. The age range was 12 to 16 years. The results showed that the correlation between integration test development of visual-motor skills and perceptual reasoning index of the WISC IV was .29. This correlation indicates that it is moderately low, but positive. That is, although there is a weak correlation between the two variables. This result is consistent with the study by Sutton and colleagues (2011) where the VMI correlated more strongly with the perceptual organization index than with verbal comprehension index.

**An Approach to the Performance of Identity in Contemporary Puerto Rican Literature**

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This paper explores the relationship between national identity and performance in contemporary Puerto Rican literature. My argument is that we perform our national identity through our bodies. This work explores definitions of performance as the way we embody identities, in other words, the way in which
the body itself becomes part of the process of producing an identity. That is why the notion of body exteriority is very important in this study and the ways this corporality is represented and symbolized. Also, how national discourse inscribes different corporalities of the body. Thus, I begin by establishing an historical outline of how Puerto Rican identity has been defined from the beginning of the 20th century to this day. I start by looking at texts by authors such as Antonio S. Pedreira, Tomás Blanco, René Marqués and José Luis González. These works are contextualized with a discussion of texts by contemporary thinkers such as Arcadio Díaz Quiñones, Carlos Pabón and Rubén Ríos Ávila. Also, I establish a theoretical framework, which analyzes performance theories using the works of Judith Butler and Elizabeth Grosz.

**Uncommon Alliances: Writing Centers and Biopsychosocial Services**

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In 2008 Universidad del Turabo in Puerto Rico started an ambitious project to increase student retention rates. With Title V federal funding for Hispanic serving institutions, it created a writing center and a biopsychosocial center. All services were under the same roof and worked in close collaboration to fulfill students’ academic, social, psychological and medical needs. At the writing center, the student retention rates of the population that benefited from our services ranged from 92% to 100% for the duration of the project up from 69% for the first year cohort in 2006. Affiliated to the writing center, there was a writing-across-the-curriculum program which offered workshops to professors across various disciplines and used guides and modules prepared by them. The writing center was institutionalized after the project ended in September 2013 and it is the first writing center in the three higher learning institutions of the Ana G. Méndez university system. This panel will discuss our unique relationship with biopsychosocial services on campus, the liaison of the writing center and professors in various disciplines, and the increase in student retention.

**Latin America's Vision in the Musical Projects of Ruben Blades and Calle 13**

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The research project titled "Latin America's vision in the musical projects of Ruben Blades and Calle 13.", is focused on examining the musical projects of both Blades and Calle 13 by analyzing the social content in their lyrics in order to understand the impact that both have had on the Latin-American society. On this project, it was possible to study in depth the language, the symbols, the social critics and the stories that both artists wanted to transmit through their songs and how they have turned this into a musical strategy. Likewise, thanks to previous research, we were able to compare the different opinions among
experts in the topic and the diverse types of reception that the music of Calle 13 and Blades has had by the public. It was demonstrated that both Ruben Blades in the nineties and Calle 13 currently have accomplished the goal of making music act as an attainable mean of communication for Latin-Americans. Thanks to these artist, the salsa genre and the urban music genre have been able to construct a collective identity allowing the receptive public to feel identified with their music. In the same way, these artists have offered a great contribution to Latin society by serving as spokesmen of what actually happens in this society and that very few people know about. This research project also demonstrates that, through music, these artists have been able to unify a Latin America that was scattered into 23 countries and, overall, they have achieved the creation of a national identity. That vision of Latin America that both Calle 13 and Ruben Blades present in their music has been able to unify the people, to entertain a nation and to educate the whole World about how true history is told from the perspective of a defeated person and not from the defeater’s perspective.

**Puerto Rico Comprehensive Animal Companion Survey: Implications for Counseling Psychology**

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Research on human-animal relationships is currently beginning to be recognized as an integral part of studying human beings. Literature has documented how the interaction between humans and animals impacts multiple aspects of health including stress and anxiety, cardiovascular health, social interactions among many others. However, most of these studies have been conducted either in Europe or the continental USA, neglecting research in other socio-cultural context, such as Latin America. Thus, the purpose of this study was to document the general beliefs and attitudes toward companion animals in Puerto Rico. Following a non-probabilistic sampling procedure, data was collected using an auto-administered questionnaire developed by the authors online and in paper. The target populations of this survey were Puerto Rican residents, aged at least over 21 years. A total of 1,436 participants completed the survey. A descriptive analysis was conducted. The results of this study showed that 84% of the participants indicated they have a pet in their home. Also, 82% participants currently have a total of 4 (mean = 3.8) pets. Regarding taking care of the basic needs of their companion animal 68% indicated they and another family member were responsible of taking care of the companion animal. Participants (39%) also indicated that they spend 12 hours or more with their companion animals and their companion animals sleep in their bedroom (49%). Among the activities they do with their mascots: 94% pets them, 92% play with them and 89% talks to them. Concerning the importance of the pet, 72% said they are very important, and 99% said they are like family. As the understanding on human-animal interaction advances, research needs to explore the varied types of interactions throughout the world. The data obtained in this study shows that the human animal bond is a very strong plays an integral role in the lives of many people in Puerto Rico. Thus, Counseling Psychology and other health professionals need to recognize this bond in order to conduct appropriate psychological interventions with the population they intend to serve.

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Vision of Woman in the Film Pedro Almodóvar

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The subject matter of this paper is to explore the image of women in the cinema of Pedro Almodóvar. Its intent is to expose and define how Pedro Almodóvar explored through his films the image of the women. It begins with an exploration of the history of the Cine in Spain as well as Almodóvar life. After exposing the history of the Cine in Spain and important aspect of Almodovar’s life, it continues providing a summary of three of Almodovar’s movies: ¿Qué hecho yo para merecer esto! (1984), Todo sobre mi madre (1999) y Volver (2006). To get into the journey of exploration of the image of the woman whom so masterfully exposes Almodóvar in his film is imperative to answers the following: What Almodóvar do with the image of women? What is the purpose of the image of women in his films? It is for this reason we will demystifying the image of women through the work of Pedro Almodóvar. Also I will identify and analyze the hiperdiscursividad of this image in his films. After all the above approach to these questions is diluted as follows; First, Almodóvar in his films demystifies the myth of the image of the woman who created the Franco as a method of social control. Secondly the “hiperdiscursividad” image of women in Pedro Almodóvar’s films through the multiple issues of social nature and social discourse as it is feminism stands. Finally this paper opens the door to see the work of Almodóvar from a biopsychosocial view, where various postures and socio-cultural discourses emerge.

The maternal instinct exists? The filicidal mothers

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The filicide is a subject that has suffered changes and transformation through the history. It is a topic that may be unknown to many and even his term also. The concept refers to parents able to kill their children’s, sons and daughters. When an event of this type arises and is a mother who commits it, we question: Where is the maternal instinct? Really exist? Question like these induce investigate this topic. The answer about maternal instinct comes to surprise when you discover that is a social construction and no something natural in a women.