



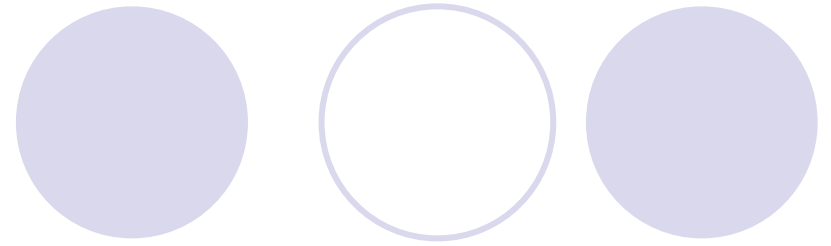
University of Puerto Rico Mayagüez Campus

Department of Electrical and Computer Engineering

INDUSTRIAL AFFILIATES PROGRAM



By Manuel Toledo-Quñones, August 2004



Presentation Outline

- Campus & ECE Department Overview
- IAP Program Overview
- Collaboration with TI
- Research at UPRM

UPRM Background

- Founded 1911
- Student Population Around 14,000
- About 4,500 Engineering Students
- Approximately 1,500 Electrical & Computer Eng. undergraduate students
- Largest Hispanic Engineering school in the United States



General Library

Summary of ASEE 2003 Ranking for UPRM

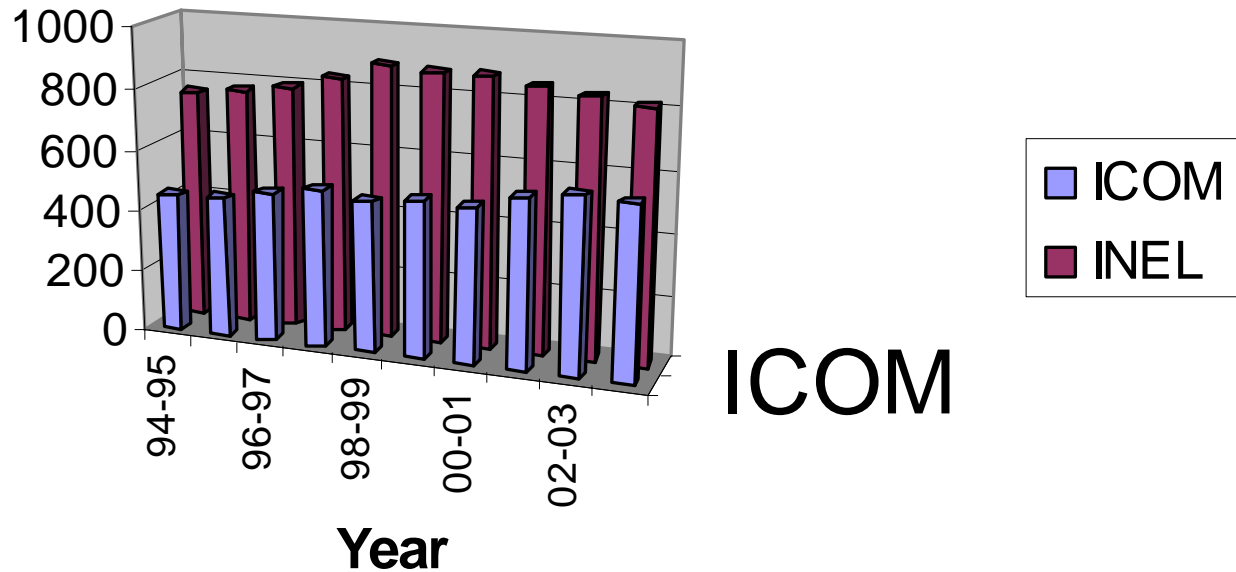
Extracted from the American Society for Engineering Education's (ASEE) *Profiles of Engineering and Engineering Technology Colleges* publication (2003 edition).

Metric	No. - Ranking
Eng. Bachelor's Degrees Awarded	710 - 19 th
Engineering Bachelor's Degrees Awarded to Women	275 - 2 nd
Electrical (Computer) Engineering Bachelor's Degrees Awarded	142 - 14 th (85 - 18 th)
Eng. Undergraduate Enrollment	4476 - 13 th
Eng. Degrees Awarded to Hispanics	710 - 1 st

ECE Department Background

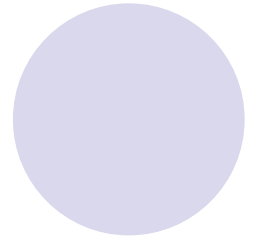
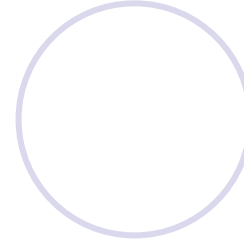
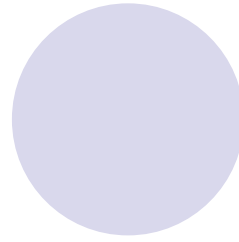
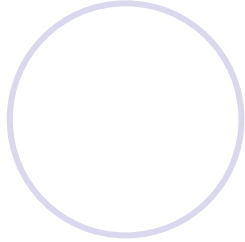
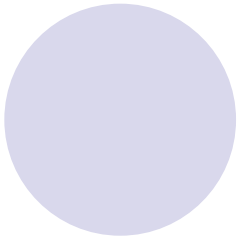
Program	Established	ABET
Undergraduate EE	1928	1960
Graduate EE	1967	
Undergraduate CE	1981	1994
Graduate CE	1995	
PhD in Computer Information Science and Engineering	2001	

Total Enrollment Electrical & Computer Engineering Dept. 1994-2002

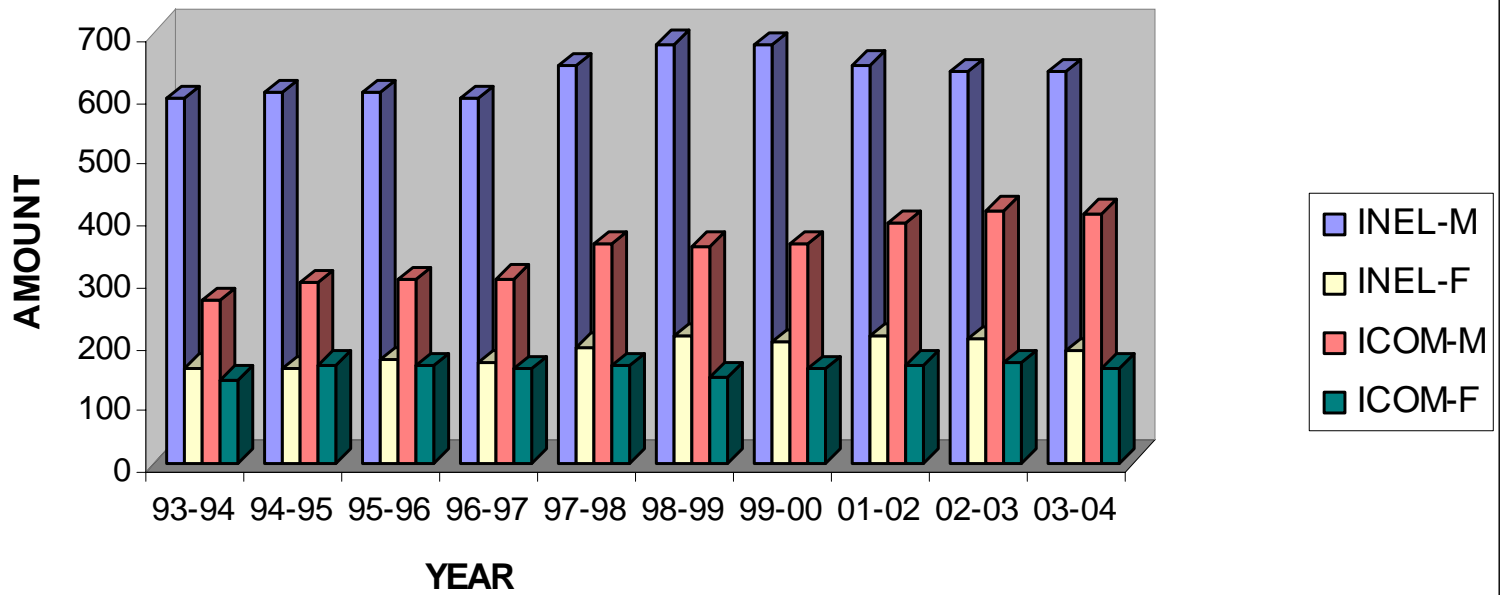


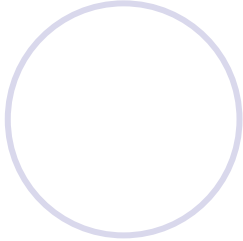
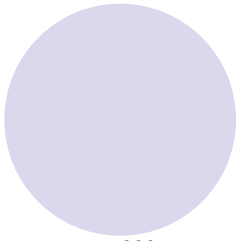
ICOM

Student Population of about 1400 - steadily increasing at about 2%
672 Students apply - 253 are accepted

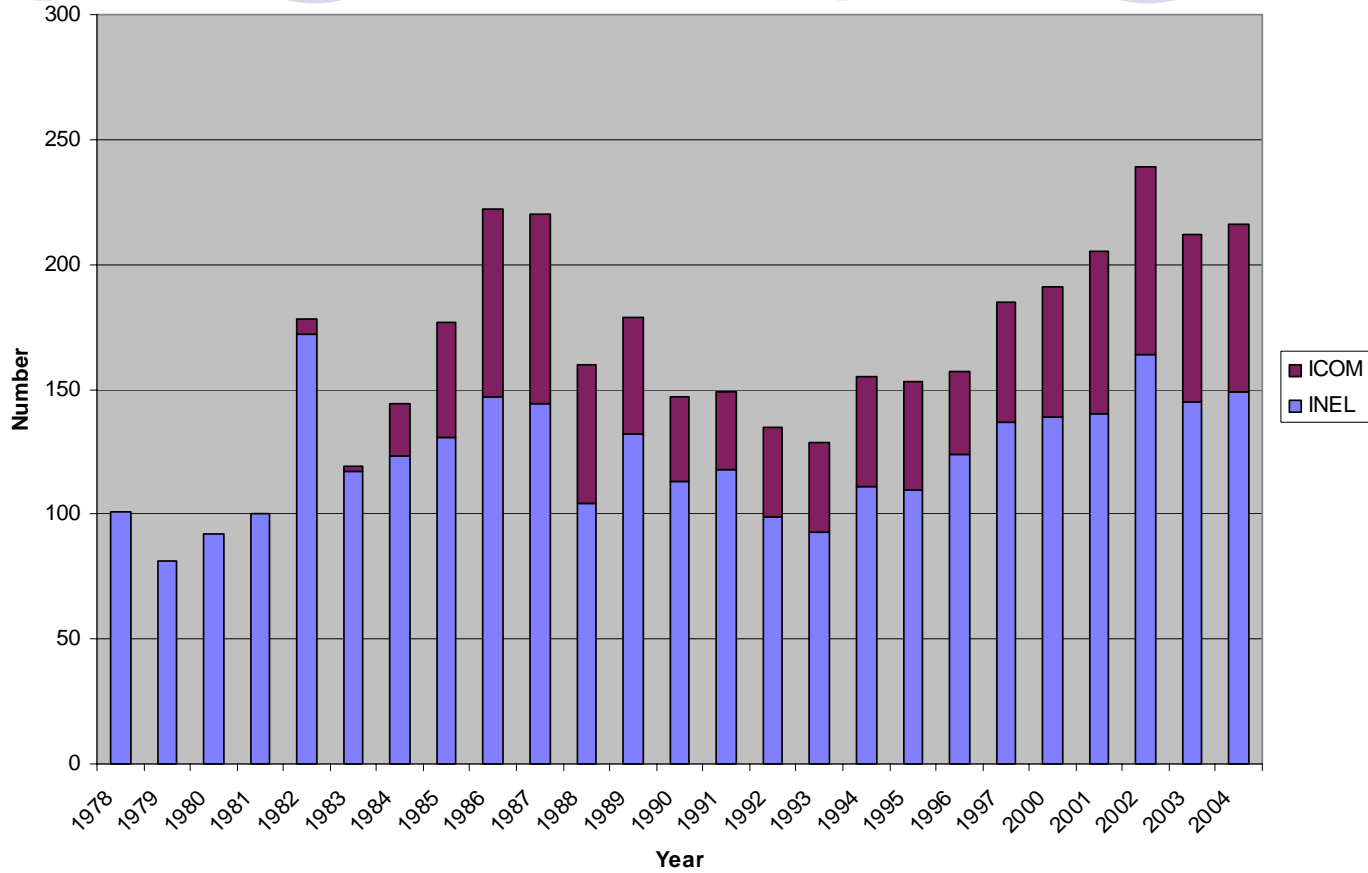
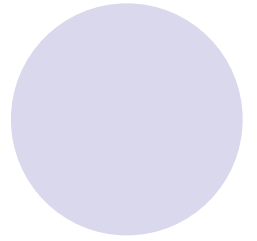
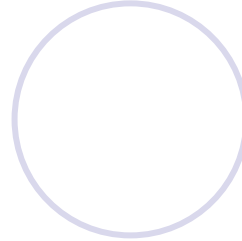
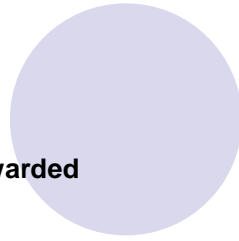


MALE AND FEMALE ENROLLMENT





Degrees Awarded



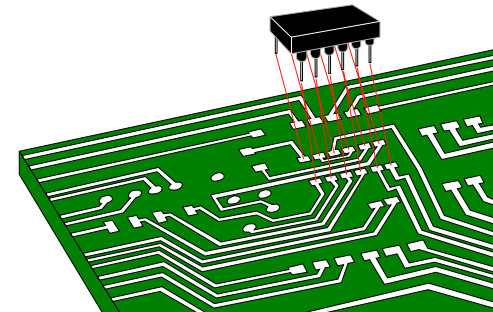
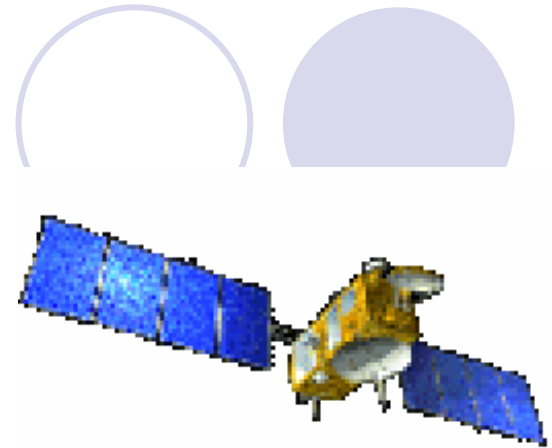


Undergraduate Program Highlights

- A **five year** program
 - Comprehensive curriculum: 168+ credit-hours
 - Heavy design component across curriculum
 - Capstone design experience
 - Research opportunities
 - Hands on experience
- **Bilingual** Program (Spanish /English)
- Flexible and up to date curriculum
- Strong faculty-student interaction
 - Mentoring
 - Small class sizes

Emphasis Areas

- Electrical Engineering
 - Electronic Systems and Devices
 - Signal Processing and Communications
 - Power Systems
 - Controls and Robotics
 - Applied Electromagnetism
- Computer Engineering
 - Hardware and Embedded Systems
 - Computing Systems
 - Communications and Signal



ECE Faculty



- 51 Faculty members
 - 26 Professors (51%)
 - 5 Associate Professors (9.8%)
 - 10 Assistant Professors (19.6%)
 - 4 Instructors (7.8%)
 - 6 (11.8%) currently on leave of study (working on PhD)
- 37 (82.22%) of the faculty presently teaching with PhD
- 34 (75.6%) of the faculty presently teaching active on research

ECE Research

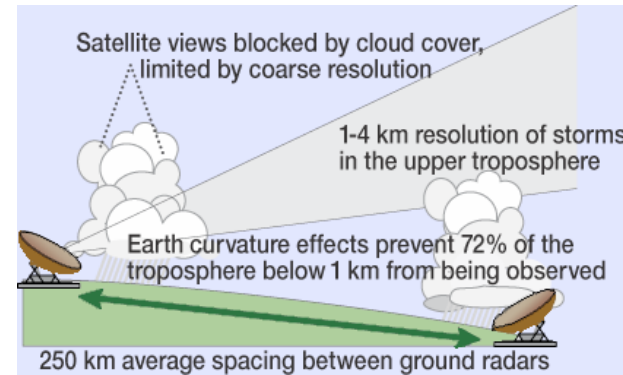
- Approximately \$4.3M/year in external funds
 - ECE accounts for 4.2% of faculty members at UPRM
 - ECE generates 24% of external funds received by UPRM
 - NSF, NASA, DoD, DoE, Government, Industry
- 1 Presidential Early Career Award Recipient, 4 NSF Career Award Recipients, 1 NASA Faculty Award for Research, NSF MRI
- Major Research Centers
 - Engineering Research Center for Subsurface Remote Sensing
 - Partner in Center for Power Electronic Systems with Virginia Tech., RPI, and NCA&T
 - Center for Computing Research and Development (CECORD)
 - Laboratory for Applied Remote Sensing and Image Processing
 - Tropical Center for Earth and Space Studies
 - Pascor (NASA funded)

ECE Department Research Centers

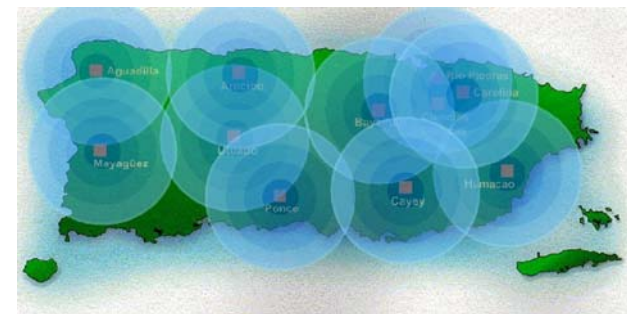
- Collaborative Adaptive Sensing of the Atmosphere (CASA) NSF ERC
- Tropical Center for Earth and Space Studies (TCESS) NASA URC
- Center for Subsurface Sensing and Imaging Systems (CenSSIS) NSF ERC
- Center for Power Electronic Systems (CPES) NSF ERC

“Collaborative Adaptive Sensing of the Atmosphere (CASA)” -- NSF Engineering Research Center

- 5 Year Award
- Goal is to significantly improve weather forecast models with dense sampling of the lower atmosphere
- Sampling is achieved with network of microwave radars
- Areas: antennas, radars, atmospheric science, meteorology, networking, social sciences.
- Researchers: J. Colom, S. Cruz Pol, R. Rodríguez Solís, L. Orama, W. Diaz



Proposed network overcomes problems with existent systems



Radar network in Puerto Rico



Tropical Center for Earth and Space Studies (TCESS)



- NASA University Research Center established in 1995.
 - Largest NASA grant in UPRM \$1.7M/year.
- Goal to conduct research and develop human resources in areas of interest to NASA enterprises.
 - Material Sciences, Image and Signal Processing, Bio-optical Oceanography, Biosystems Engineering
- Participation of 27 faculty, and nearly 100 students at the BS, MS and Ph.D. level from the Colleges of Engineering, Arts and Sciences, and Agriculture
- K-12 NASA Globe outreach program that has impacted over 30,000 students and 1,600 teachers in 8 years
- Over \$20M leveraged in external funds to support research and develop infrastructure.

Project Director: Dr. Miguel Vélez-Reyes
Electrical and Computer Engineering



Center for Power Electronic Systems

- The first NSF Engineering Research Center with UPRM participation
- Consortia of 5 Universities and 77 industrial partners lead by Virginia Polytechnic Institute
- Mission
 - Improve the competitiveness of US power electronics industry by developing an integrated system approach via Integrated Power Electronics Modules (IPEMs)
- At UPRM 6 faculty and over 22 students from Electrical and Mechanical Engineering
- UPRM research in distributed control of distributed power systems, electro thermal modeling, design optimization, power converters, power quality, alternate energy sources, and electric drives.
- Comprehensive education program in electric energy processing systems

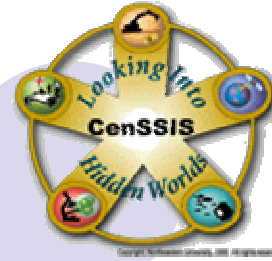
Project Director: Dr. Miguel Vélez-Reyes
Electrical and Computer Engineering



North Carolina Agricultural And Technical State University



Center for Subsurface Sensing and Imaging Systems (CenSSIS)



- Second NSF ERC with UPRM participation.
- Consortia of 4 Universities, 5 Strategic Partners, and 13 industrial partners.
- Mission:
 - To revolutionize the existing technology for detecting and imaging biomedical and environmental-civil objects or conditions that are underground, underwater, or embedded in the human body
- 8 faculty and 17 students from Engineering, and Arts and Science Faculties.
- UPRM research in sensing and modeling, signal processing and image understanding, data and image information management.
- Applications of interest: biomedical, environmental, and homeland security.

Project Director: Dr. Miguel Vélez-Reyes

Electrical and Computer Engineering



For more information

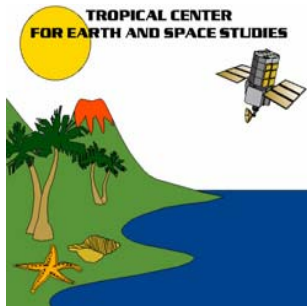
- TCESS/CenSSIS/CPES

- Dr. Miguel Vélez-Reyes, m.velez@ieee.org

- CASA

- Dr. Sandra Cruz-Pol, SandraCruzPol@ieee.org

- Dr. Jose Colom-Ustáriz, colom@ece.uprm.edu



Computing Research @ UPRM

- Research Group in Computing
 - Advanced Data Management Group
 - Parallel and Distributed Computing Group
 - Automated Information Processing Group
 - Human-Computer Interaction Group
- Active Projects
 - E-government (NSF - \$750K)
 - TerraScope (NASA - \$100K)
 - InduSoft (PRIDCO - \$1.5M)
 - CISE Terascale Facility (IBM SUR – \$150K)

Contact: Manuel Rodriguez (mrodriguez@acm.org)

Questions?

