Industrial Affiliates Program: A value proposition for the enhancement of a career oriented education

A proposal submitted to "**Your Company Name**"

By Dra. Vidya Manian, IAP Coordinator

and the IAP Committee

Executive Summary

The Industrial Affiliates Program (IAP) is an innovative model of active learning. Through undergraduate research, the program addresses today's pressing needs of blending theory with practice, education with work, and academic scientific rigor with industry's fast pace.

The IAP program was founded in 1989 by the Department of Electrical and Computer Engineering (ECE). It is fully sponsored by companies who work closely with ECE faculty at UPRM. Participating students learn through research, enrich their academic experience and interact with cool new technologies. The program tests students' capacity to work independently and interdependently at solving real problems and presenting their solutions to the public. In the process, they develop crucial skills including critical and creative thinking, teamwork, communication, organizational, and experimental skills.

ECE faculty members submit undergraduate research proposals annually. The selected research projects receive funding up to five thousand dollars ($5,000.00). IAP students carry out their projects under the guidance of participating ECE professors.

IAP holds two annual meetings: A posters presentation during the fall and oral reports together with laboratory demonstrations during the spring. This is a great opportunity for the student to show their work to industry representatives, faculty, and other students.

Projects provide students with Industry specific skills not acquired in the classroom setting. Companies acquire enhanced visibility within the student population at large. Also, companies get easy access to faculty with compatible interests and early access to student resumes for summer internships, coops, and full time positions.

Program Description

The main objective of the IAP proposal is to invite companies to join our program in order to increase participation of undergraduate student working on industry related research projects.

Affiliates enjoy improved visibility of the Electrical and Computer Engineering student population and other benefits including:

- Access to IAP's Fall and Spring Meetings
- Access to student's online resume database
- Promotional visibility of affiliates in our permanent display at the Engineering Faculty amphitheater and website
- Online access to previous student presentations
- Access to participating professors and students
- Active participation in IAP Board Meetings
- Opportunity to identify topics of interest collaboratively with participating ECE faculty
- Access to our Lab Tours and yearly IAP Demos

To meet the expectations of our constituency, the IAP committee continuously evaluates all aspects of the program. Increasing the number of affiliated companies is a key element of the development strategy. Increased company participation directly impacts the program's ability to promote new ideas. Please ask about our IAP Ambassador recruitment program.

The following eight companies are currently participating in IAP: Texas Instruments, Raytheon, Verizon, MIT Lincoln Laboratory, Harris, NXP Semiconductors, General Motors Foundation, and Sikorsky a Lockheed Martin Company, our latest partner. Among these companies there are several projects sponsored directly from our affiliates. These projects began as collaboration at the IAP program and developed further into formal projects with the ECE Department.

Program Facts (2014)

During its twenty-five years' history, IAP impacted more than 1,000 undergraduate students directly participating in the program. ECE has acquired more than $250,000 in equipment and close to $700,000 allocated to project funding. **This year, and for the first time, UPRM administration is committed to match dollar per dollar all IAP funds.** Other facts include:

- 73 students (90% increase from 2010)
- 30% female student participation (16% Previously)
- 21 professors (38% increase from 2010)
- Online proposal submission (New)
- Updated proposal guidelines
- Redesigned poster preparation workshop
  - ☐ Includes all member's logos at the bottom of poster
  - ☐ Includes logo of the sponsoring company also at the top corner of the poster
- Joint IAP - UPRM IEEE (Student Branch) workshop on Resume writing, Interviews do's and don'ts and Mock interviews.

Program Detail

The program starts with the inclusion of your company as a member through the full payment of the membership. Member companies have exclusive access to our Fall and Spring meetings, IAP students and our Resume book before any other recruiting company. This is important, as IAP faculty chooses their best students for the IAP projects. In our experience, company representatives frequently offer internships, coop or even full time employment to IAP students.

Companies have the opportunity to collaborate with ECE Faculty to jointly identify topics of interest for IAP projects (please see the membership section below). A member of the ECE faculty could then submit an IAP proposal with emphasis in the topics identified jointly.

Finally, a representative from each member company participates in the IAP Advisory Board. The Board meets with the IAP Faculty Committee twice every year, during the Fall Meeting and during the Spring Annual Conference. This meeting is a way to improve the IAP program through thorough feedback from the companies, thus creating continuous flow of solutions and opportunities for the program.

Membership

The membership fee is $8,000.00/yr. This fee includes access to all activities, listed in the program details section above. All donations are allocated to fund administrative expenses and the undergraduate research projects[1].

Companies interested in collaboratively developing topics of interest for IAP projects with ECE faculty are asked to support an additional $3,000.00 per project to cover additional expenses. It is recommended to synchronize project execution with the IAP Calendar. However, new affiliates are accepted throughout the academic year.

IAP is a sponsorship[2] program, most donations are tax deductible in P.R. and USA. If interested in partnering with our innovative program, please send a check to the ECE/UPRM Industrial Affiliate Program. Our mailing address is:

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IAP/Electrical and Computer Engineering Dept.

University of PR Mayaguez Campus

Call Box 9000

Mayaguez, PR 00681

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[1] Hotel and travel expenses not included.

[2] The IAP Program, Coordinator, Committee, and Faculty are unable to commit to deliverables or terms and conditions with regards to the UG projects, proposals, and donations to the program. Projects between interested parties and the ECE Department are welcome and can be formalized through the ECE Department Chair.

2014-2015 IAP Project List

- A Calibration Experiment for the Characterization of Transient Voltage Thresholds in Integrated MOSFETs

- Active Noise Cancellation for a Robot Telepresence System

- ASAP-PQM an Automated Power Line Monitoring & Disturbance Analysis System

- Automated Model Extraction for Gate Enclosed MOSFETs

- Automation of the Off-The-Grid X-band Weather Radars

- Bandwidth Requirements for In-Home Wi-Fi video Streaming

- Cybersecurity on Unmanned Vehicles

- Design of a Crossover Network and Acoustic Characterization of an Audio Loudspeaker

- Design of a Current Feedback Operational Amplifier

- Development of a Power Amplifier for the UPRM OTG Radar

- Digital Receiver Subsystem for an Off-the-Grid X-band Weather Radar Doppler Upgrade

- Efficient Data Distribution on VESO Mesh

- Extracting Organizational Structure from Social Networks using VizLinc

- Fast Extraction for a Simplified BSIM3 CMOS Model

- Hardware Implementation of a Rapid Frequency Response Analysis Algorithm

- Mel Frequency Cepstrum Coefficient Feature Extraction using Graphical Processing Units

- MSP430 One Line Assembler

- Phased-Array Fed Discrete Lens Array

- Power Driving of a High Voltage Air Conditioner Using Solar Panels

- Prognostic Generator: Implementation Phase

- Proximity-Aware Gestural Interaction with Large Scale Displays using Microsoft Kinect

- Reverse Recovery Charge (Qrr) Automation

- TARZAN WATCH – Campus Safety with a Smartphone App

- The Quadcopter and the Micromouse: A Cooperative Robotic System

- Trash Pick-up Robot

- UPRM's Solar Boat: The Solar Splash Competition – Design and Implementation of the Sensor-Actuator System for Foil Stabilization

- Using Virtual System Prototyping to Evaluate Standards Based Satellite Platforms

- Variations in Drop Size Distribution (DSD) During Wet and Dry Seasons in Puerto Rico