

Technical Communications Series Benefits Undergraduates and Graduates

Directors of DREAM (EEC 0353922 and 0649033): Dr. Surya Kalidindi and Dr. Antonios Zavalangos

Directors of SENSORS (EEC 0552711): Dr. Caroline Schauer and Dr. Jin Wen

“Good engineering will require good communication,” according to the 2004 report from the National Academy of Engineering entitled *The Engineer of 2020*.

Two NSF-sponsored Research Experiences for Undergraduates (REU) sites hosted by Drexel University incorporate a series of workshops designed to address this issue. In addition to 10-week research internships, students in DREAM: Drexel Research Experience in Advanced Materials and SENSORS: From Design to Implementation are asked to create a technical poster about their REU research and a two-page research proposal based on the original research section of the NSF Graduate Research Fellowship Program application.

“An *original* research proposal can be difficult for some undergraduates, especially those in our DREAM program, because many of them are early on in their college experience,” explains Ms. Holly Burnside, a Drexel College of Engineering (CoE) staff member who leads the communications workshops. “As undergraduates, they are typically handed the information. As graduate students, they have to start thinking critically and be able to formulate research questions. The REU program attempts to bridge that gap.”

The workshops were designed by Burnside, CoE staff members Ms. Dorilona Rose and Ms. Sheila Berninger, and SENSORS Principal Investigators, Dr. Caroline Schauer and Dr. Jin Wen.

“We can’t just assign the poster and the proposal and expect the students to know what to do. We want to give them some guidance,” said Rose. “It is also important to give them some context; to try to explain *why* they have been given these assignments.” Thus, the first workshop focuses on the social nature of science and engineering and why effective communication is important. Subsequent workshops focus more specifically on each assignment.

This year’s proposals were reviewed according to NSF merit review criteria by a panel of seven current engineering graduate students from Drexel. Five of them are NSF Graduate Fellows themselves; one is an NSF-IGERT Fellow and one an NSF GK-12 Fellow. The panel selected three proposals “for funding,” and one Honorable Mention. All of the REU students received anonymous, personalized feedback on their proposals.

“This is a great experience for the REU students. Through this workshop, we encourage them to apply for graduate school and for the NSF and other highly competitive fellowships,” said Rose.

Since the DREAM program began in 2004, 90% of all DREAM and SENSORS students have pursued or have expressed an interest in pursuing graduate school.



Figure 1 Holly McIlwee in Caroline Schauer's Natural Polymers and Photonics laboratory.

“The help we got from the workshops beforehand and the peer review was invaluable to me while writing all three essays for the NSF-GRFP,” cites Holly McIlwee, a Drexel University senior who worked in Dr. Caroline Schauer's Natural Polymers and Photonics Lab for her SENSORS experience. “Writing a peer reviewed draft in the summer was perfect for the timing of the application deadline in November.” McIlwee's poster was selected as the best poster from the SENSORS program.

DREAM student Dewi Harjanto agreed.

“I've just finished applying to eight different graduate schools, including Drexel. I have also applied to the NSF Graduate Research Fellowship and having the proposal already written up as part of the summer program was a huge help. I probably would not have bothered applying for the NSF Graduate Research Fellowship if I hadn't had the proposal already written because time is at such a premium,” said Harjanto, a senior from Olin College.

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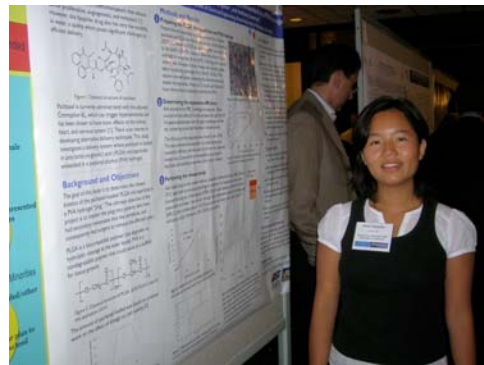


Figure 2 Dewi Harjanto at the NSF Engineering Education Awardees Conference in September 2007.

Harjanto's research proposal was selected as one of the top three by the graduate student panel.

The review panel is also a good experience for the graduate students.

“The panelists demonstrated great scientific knowledge, sharp observational capability, and professional debate skills,” said Wen, who moderated the 2007 panel. “Our panelists also told me that they have learned a lot about how to write proposals from this review experience. I believe such an experience will help them write better proposals in the future.”

More information on both programs can be found at:

<http://www.mse.drexel.edu/programs/dream/>

<http://www.mse.drexel.edu/programs/sensors/>