PEER-LED TEAM LEARNING
COMPUTER SCIENCE

INTRODUCTION TO COMPUTER SCIENCE

BARBARA G. RYDER AND PRADIP HARI

Rutgers **E**merging **S**cholars in **C**omputer **S**cience (RESCS) is a program designed to recruit top incoming freshmen with strong math/science backgrounds, from groups currently underrepresented in Computer Science, to enroll in an introductory Computer Science course (CS1) that includes a special additional discussion section. In the two-hour weekly discussion session, participating students work in small groups on challenging problems designed to help them gain a thorough and in-depth understanding of the class material. This is **supplemental** learning, **not remedial**. Through the interactive discussions and regular study meetings, we hoped to increase participants' enthusiasm for Computer Science. The discussion sections were led by outstanding undergraduate peer leaders, often members of underrepresented groups themselves, who have been trained in how to facilitate group learning. Students received one additional course credit over the 'normal' four credits for CS1, for their participation in this program.

A consortium of eight colleges and universities – Rutgers, Purdue, Georgia Tech, Duke, Beloit, Loyola (MD), University of Wisconsin - Madison and University of Wisconsin - Milwaukee -- joined together in this project. The emerging scholars in Computer Science program has been supported by a collaborative NSF grant among these schools. An initial year-long version of the program, WES-CS, was run by Professor Susan Horwitz at the University of Wisconsin - Madison. Starting in Fall 2005, programs were run at each of the participating schools, including the Rutgers RESCS program.

Each academic year we increased the set of modules available for RESCS. The modules which follow below were developed for use in the Rutgers DCS CS1 course, CS111, when we started in Fall 2005. These and exercises with versions for both students and Peer Leaders are available through two of Consortium's partners, Duke University (http://www.cs.duke.edu/csed/des/) and University of Wisconsin at Madison (http://research.cs.wisc.edu/wes-cs/).

At Rutgers, we also ran Career Nights each semester for the participants, featuring Rutgers DCS grads who visited for an evening to share their job experiences with undergrads in the department; recordings of these sessions are available on the RESCS website (http://rescs.rutgers.edu/careerS08/CarNight.html). During academic year 2008-2009, after three years of running the RESCS program at Rutgers as an experiment, we have mainstreamed RESCS as the 1 hour weekly recitation activity in the CS111 course. This is progressing fairly successfully. Mr. Pradip Hari, coordinator for *Introduction to Computer Science (CS111)* reports "overall, things are going well; [this] is definitely an improvement over the previous labs."

Dr. Barbara G. Ryder   Pradip Hari
Formerly: Professor, Computer Science, Rutgers University   Instructor, Computer Science
Currently: Head - Dept. of Computer Science, Virginia Tech   Rutgers University
J. Byron Maupin Professor of Engineering   *phari@cs.rutgers.edu*
ryder@cs.vt.edu

Comments from our peer leaders on why they choose to study Computer Science give a personal view for our participation in this project.

Why did I choose to study Computer Science?

Computers are everywhere. Most people use them everyday, in some form or other. Knowing how they work will give me a great advantage in today's world. I always enjoyed learning how things work on the inside and why they do what they do. There have been many times in my computer science classes when the professor explains a concept or an idea and I say to myself "That's how they do it!" Learning the mysteries of something so complicated yet amazing and realizing that it's not that complicated after all, but still just as amazing, is what I want to do for the rest of my life.

I first decided to take a CS course as an elective to fill a gap in my schedule, and had no desire to continue with it. However, after a few weeks, I realized that I really enjoyed it. It taught me to think in a new and interesting way, and to solve problems I previously never would have considered. Although it is often challenging, the feeling of success I receive when I finally solve a difficult problem makes the challenge worth it. In addition, I decided to change my major to CS because of the opportunities it presented. Doors open in every field with a good knowledge of computers, and I feel that my background in computer science will make me a competitive job applicant for any position I apply for.

Growing up I have always had a strong interest in mathematics and the sciences, but it wasn't until I took a CS elective class in high school that I thought of Computer Science as a possible subject for me to study. I realized that most every company or institution heavily relies on computers every day in order to function, and that having a career in Computer Science offered me a flexibility in where and for whom I could work for in the future. The fact that all organizations, from the government, to huge Wall Street companies, to small non-profit organizations could all potentially offer me a future job position is what I feel is most appealing about studying Computer Science.

Career night panelists Fall 2006: Nick Smoley, Kathleen Greslik, Karen Kanu, David Tabora.

We're not always serious!

Helen Nayfeld, Emily Rodriguez, and Sara Hahn Jacobs in Madison, WI on break from PLTL training, try on 'cheese head' hats.

And we try them on again in spring 2006 (Helen Nayfeld, Tom Schirripa, Emily Rodriguez, Aneta Biesiadecka)

Working over the summer at the Ryders'!! (L to R: Tom Schirripa, Emily Rodriguez, Helen Nayfeld, Aneta Biesiadcka, Pradip Hari)