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A Newsletter of the Department of Computer Science and Engineering at the University of Notre Dame

IN THIS ISSUE

— Flynn and Bowyer Awarded Grant for Biometrics Research

— Madey, Kareem, and Kijewski-Correa Receive NSF Grant

— Hu Awarded Two National Science Foundation Grants

— Chawla and Thain Receive NSF Grant

— Cieslak Receives Travel Grant

— Uhran Awarded Grant for Educational Workshop

— Meurer Speaks to Database Concepts Class

— 2007 Schubmehl-Prein Essay Contest Winners Announced

— Shillingford Awarded Two Travel Scholarships

— Hollingsworth and Steinhaeuser Win Awards at CSE-SRS 2007

— Twenty-two CSE Majors in the Marching Band

— Save the Date: '08 Tailgate Party

Collins and Madey Awarded $20 Million from Gates Foundation

Frank Collins

Gregory R. Madey

The Bill & Melinda Gates Foundation has awarded a grant in excess of $20 million to **Frank Collins,** the George and Winifred Clark Professor of Biological Sciences, director of the Center for Global Health and Infectious Diseases, and concurrent professor of computer science and engineering, and **Gregory R. Madey,** associate professor of computer science and engineering. Grant monies will be used over the next five years in support of collaborative, multidisciplinary efforts to develop and evaluate improved methods for controlling malaria.

"It's a noble goal and certainly one that meshes with the Catholic mission of the University," says Madey. "Malaria kills more than one million people annually, mostly young children and infants. It is a disease of poverty and the underserved." Malaria is not, however, a disease that's often discussed in the United States, largely due to a massive eradication program that began in 1947. Since the early 1950s the role of the Centers for Disease Control and Prevention (CDC) in relation to malaria has shifted from a solely national focus to surveillance within the U.S. and assistance in worldwide efforts to eliminate the disease in economically underdeveloped areas.

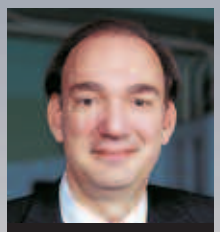
According to the Gates Foundation, the successful Notre Dame proposal addressed all three of its funding criteria, being that malaria (1) causes widespread illness and death in developing countries, (2) represents a great inequity in health between developed and developing countries and, (3) receives inadequate attention and funding.

"One of the largest components of the program," says Collins, "is the development of a series of direct and indirect measurements of the rates of transmission of malaria parasites by mosquitoes." Other key activities in the program include the evaluation of standard approaches to malaria control and the study of certain kinds of biological phenomena that impact on the interventions (controls), such as insects becoming genetically resistant to insecticides.

Notre Dame's research partners include the Swiss Tropical Institute, the CDC, the London School of Tropical Medicine and Hygiene, and Durham University. This consortium, led by Collins and Madey, features test areas in the East African highlands, urban Dar es Salaam (Tanzania), western Kenya, Zambia, and Indonesia. Watch this newsletter and the departmental Web site for program updates.

FLYNN AND BOWYER AWARDED GRANT FOR BIOMETRICS RESEARCH

Patrick J. Flynn


Kevin W. Bowyer

Professor **Patrick J. Flynn** and Schubmehl-Prein Chair **Kevin W. Bowyer** were awarded a grant through the Central Intelligence Agency and the National Science Foundation (NSF) to continue their biometrics research. In the past year, Flynn and Bowyer were co-authors of a report from the National Institute of Standards and Technology that documented the performance achievable with face recognition and iris recognition. Their work over the next year will concentrate on recognizing people from video data streams that image the face and/or the iris.

X. Sharon Hu.

Hu Awarded Two National Science Foundation Grants

Associate Professor **X. Sharon Hu,** together with principal investigator Professor **Michael D. Lemmon** (electrical engineering), received an NSF grant to support their work on integrating decentralized control and real-time scheduling for networked dynamical systems. Networked dynamical systems are found throughout the national infrastructure, e.g., the national power grid, wastewater networks, and the national transportation system. This project seeks to explore alternative control and scheduling approaches to provide performance guarantee for such large networks without excess demands on underlying computing systems.

Hu, together with co-PIs Associate Professor **Marya Lieberman** (chemistry) and Frank M. Freimann Professor **Wolfgang Porod** (electrical engineering), also received an NSF grant to support work on constructing reconfigurable logic and devising defect detection, diagnosis, and tolerance techniques for Quantum-dot Cellular Automata (QCA) based nano-scale devices. QCA-based devices differ fundamentally from traditional CMOS ones and have the potential to alleviate challenges facing CMOS, as device sizes continue to shrink.

Chawla and Thain Receive NSF Grant

Nitesh Chawla

Douglas L. Thain

Assistant Professors **Nitesh Chawla** and **Douglas L. Thain,** in collaboration with Assistant Professor **Shaowen Wang** at University of Iowa and Senior Research Scientist **Xiaohui Song** at Purdue University, received a grant titled "Troubleshooting Large-scale Computing Grids with Machine Learning Techniques." In short, machine-learning algorithms can be used for debugging problems in large-scale complex systems. The proposal poses the following research questions: What sort of failures are most common in grids? What data must be collected to identify these failures? What innovations in machine-learning algorithms are required to be successful in this domain?

Madey, Kareem, and Kijewski-Correa Receive NSF Grant

Associate Professor **Gregory R. Madey,** collaborating with Robert M. Moran Professor **Ahsan Kareem** and Rooney Family Assistant Professor **Tracy Kijewski-Correa** in the Department of Civil Engineering and Geological Sciences, was awarded a grant titled "VORTEX-Winds: A Virtual Organization for Reducing the Toll of Extreme Winds on Society." The computer science elements of this work involve the development of e-technology and cyber-infrastructure tools to support civil engineering analysis of how buildings react to extreme winds.

Cieslak Receives Travel Grant

Ph.D. student **David Cieslak** was the recipient of a student travel grant for IEEE ICDM'07. He presented his work "Detecting Fractures in Classifier Performance," co-authored with advisor Assistant Professor **Nitesh Chawla,** as a regular paper at the Seventh IEEE International Conference on Data Mining (ICDM) that took place in Omaha, Nebraska, on Oct. 28-31, 2007. ICDM is considered a premier conference in data mining, accepting only 38 of 526 (7 percent) submissions as regular papers this year.

David Cieslak

Uhran Awarded Grant for Educational Workshop

John J. Uhran Jr., professor emeritus, was awarded a National Science Foundation grant to support a workshop titled, "Dialogue II on Engineering Education: The Role of the First Year." The workshop was held at Notre Dame from July 29-31, 2007, for the second year in a row. A number of well-known engineering educators participated, and attendees came from all over the country and included several high school teachers.

John J. Uhran Jr.

Meurer Speaks to Database Concepts Class

Students in last semester's *Database Concepts* course were fortunate to have a visit from Notre Dame grad **Tom Meurer.** After completing his B.S. in electrical engineering in 1966, Meurer worked in software engineering and databases with Goodyear Corporation, the U.S. Navy, and Cullinet. But then his career path shifted a bit, as he started up, sold, and took public a series of companies, all of which develop and market successful products based on database technology.

During the class, Meurer shared his insights into the key elements of database technology, what makes a good database-oriented product/company, and how to prepare for a successful career after graduation. Tom is a strong supporter of the department, and we thank him for his involvement in our students' education, which also includes the establishment of the Meurer Endowment Fund for Excellence.

2007 Schubmehl-Prein Essay Contest Winners Announced

The Schubmehl-Prein Competition for the best essay on the social impact of computing technology is open each year to high school juniors. The first-place prize is $1,000, second-place is $500, and third-place is $250. Winning entries are published annually in the Association for Computed Machinery's Computers and Society online magazine.

The winners of the 2007 Schubmehl-Prein Competition are: first place, **David Martinez,** Damien High School, California; second place: **Tunlewa Soyinka,** Damien High School, California; and third place: **Maria Lee,** Hillsdale Academy, Michigan. There were two unusual aspects of this year's competition. One is that the only school from which multiple entries were received is Damien High School in La Verne, Calif. The second aspect, undoubtedly related to the first, is that the top two prizes went to students from the same school. This is the second time that the top two winners have come from the same school. In 2005, the top two winners were from Greenwood High School in Indiana.

Details of the 2008 competition and a history of previous winners are available on the competition Web page: http://www.cse.nd.edu/EssayContest.

Shillingford Awarded Two Travel Scholarships

Ph.D. student **Nadine Shillingford** was awarded two scholarships to attend both the Grace Hopper Celebration of Women in Computing Conference and the Richard Tapia Celebration of Diversity in Computing Conference. Both conferences were held in Orlando in October. The Grace Hopper Conference was the seventh in a series of conferences designed to bring the research and career interests of women in computing to the forefront, and the Tapia Conference provided a welcoming and supportive setting for all participants, particularly for students from under-represented groups.

Nadine Shillingford

HOLLINGSWORTH AND STEINHAEUSER WIN AWARD AT CSE-SRS 2007

Nineteen graduate students showcased posters of their research during the annual Computer Science and Engineering Student Research Symposium (CSE-SRS) on Nov. 1, 2007. **Karen Hollingsworth,** whose poster was entitled, "All Iris Code Bits Are Not Created Equal," won the student vote. She is advised by professors **Kevin W. Bowyer** and **Patrick J. Flynn.**

Karsten Steinhaeuser, whose poster was entitled, "Using Node Attributes to Improve Community Detection in Networks (UNICODE)," won the faculty vote. He is an advisee of Assistant Professor **Nitesh Chawla.**

Each of the awardees will receive $100 cash, as well as a certificate, at an award ceremony in spring 2008. The posters can be seen in the display cases outside the departmental office at 326 Cushing.

Karen Hollingsworth

Karsten Steinhaeuser

Congratulations to the winners!

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Twenty-two CSE Majors in the Marching Band

The 2007-08 Notre Dame Marching Band included an amazing 22 CSE majors, representing band participation about three times the average for Notre Dame undergraduates. In alphabetical order by last name, they are: **Alex Bess, Michael Brickl, Jared Bulosan, Adam Cunningham, Natalie Dehen, Chris Dondanville, Benjamin Drda, Brendan Geisler, Joseph Jurasko, Alyssa Krauss, Brandy Mader, Nick McLees, John Meehan, Jonathon Metallo, Kevin Partington, Peter Rowlands, Nicolas Schott, Patricia Strei, Michael Sullivan, Joe Thompson, Robert Wettach,** and **Stephen Woods.** Nineteen of the 22 band members are pictured in the photo. The Marching Band puts in long hours during football season — two hours of practice each week day, plus game-day performances on weekends.

Congratulations to all of our CSE band members for their time-management skills and their musical abilities.

SAVE THE DATE: '08 TAILGATE PARTY

The computer science and engineering and electrical engineering departments had a joint alumni tailgate this year before the Navy game (Nov. 3). It was a fantastic day of football ... until the last overtime. But the fellowship was great in any case.

Next year's event, another pre-game party, will be held on **Saturday, Nov. 1, the Pittsburgh game.** Plan to attend, catch up with old friends and colleagues, and meet new ones.

For more information, contact **Leona Strickland** in the Department of Electrical Engineering at Strickland.2@nd.edu or call (574) 631-5480.