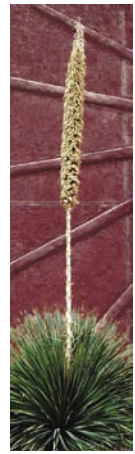


Computer Bytes



Computer Science Department
New Mexico State University

Fall 2005



CS Welcomes Bioinformatics Professor



L-R Desh Ranjan, Lydia Kavraki, Pam Hunt (Advance), Karen Villaverde

The Center for Bioinformatics and Computational Biology, together with the Advance program, hosted **Lydia Kavraki** of Rice University under the universities visiting lecture series. She is the Noah Harding Professor of Computer Science and Professor of Bioengineering at Rice University. She also holds a joint appointment at the Department of Structural and Computational Biology and Molecular Biophysics at the Baylor College of Medicine in Houston. Kavraki received her BA in Computer Science from the University of Crete in Greece and her Ph.D. in Computer Science from Stanford University. Her research contributions are in physical algorithms and their applications in robotics (robot motion planning, assembly planning, micromanipulation, and flexible object manipulation) and computational

structural biology and bioinformatics (modeling of biomolecular interactions, molecular design, computer-assisted drug design and the large-scale functional annotation of proteins). Kavraki has authored more than 80 peer-reviewed journal and conference publications and is one of the authors of a new robotics textbook published in 2005 by MIT Press. She recently gave one of the keynote addresses at the Grace Hopper Conference Celebrating Women in Computing (see story on page 2). Over the course of three days, she gave several public lectures, in which her theme was the discovery of new medicines. **Dr. Karen Villaverde** was instrumental in initiating the visit, and she and Pam Hunt of the Advance office made Dr. Kavraki feel welcome during her stay at NMSU. ☺

Son Tran wins Research Award

Dr. Son Tran (Computer Science) has been selected as one of the recipients of the “Junior Faculty/Staff Award” for the fourth



annual University Research Council Award for Exceptional Achievement in Creative Scholarly Activity. He was awarded \$2000 at the Fall Convocation. Dr. Tran’s work is in logic programming and bioinformatics. ☺

Computer Bytes

Computer Bytes is a production of the Computer Science Department of New Mexico State University, produced once a year, in the Fall semesters.

Written and produced by the Computer Science Department faculty and Staff.

Edited by Roger Hartley.

For past issues or for copies of this issue, please contact csoffice@cs.nmsu.edu, or call (505) 646-3723.

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Message from the chair

Dear friends, It has been an eventful and successful year for the computer science department.

The department continues to excel in its basic mission of teaching, research and service. As you read through this issue of Computer Bytes you will find out about many exciting activities going on in the department. The center for Bioinformatics, that was set up last year, is beginning to pick up steam with participation of several faculty members and graduate and undergraduate students in research projects. It has new space on the second floor of Science Hall.

We have hired a new faculty member Dr. Joe Song whose research expertise is Bioinformatics and a Program coordinator, Linda Sandoval. The Center researchers have built up partnerships with Los Alamos National Labs and Iowa State University that have resulted in substantial grants (more than a million dollars) to provide opportunities to graduate students pursuing research in Bioinformatics. The department hosted two very successful and well-received camps this summer - one for high school students and another for students from tribal and community colleges. These initiatives to expose more students to exciting careers in computing will continue for several years to come through support from National Science Foundation. Our faculty, staff and students were, once again, recognized for their excellence. Dr. Son Tran and Dr. Enrico Pontelli received University awards for outstanding research accomplishments. Ivan Strnad, our Computer Operations Group Manager, received the First Light Federal Credit Union Outstanding Professional Employee award. Islam El-Kabani a graduate student received an outstanding graduate student award. Several other graduate students received tuition and other scholarship awards from NMSU Graduate School.

Our undergraduate and graduate students organizations continue to be active in organizing events and

performing community service. The NMSU chapter of the ACM organized programming competitions for novices, high-school students as well as for NMSU students. It also ran a LINUX installfest for the Las Cruces community. In March, the Regents of the University, President Martin, Provost Flores and the Dean Cruzado-Salas visited the Science Hall and recommended us for what our students, staff and faculty have been able to accomplish.

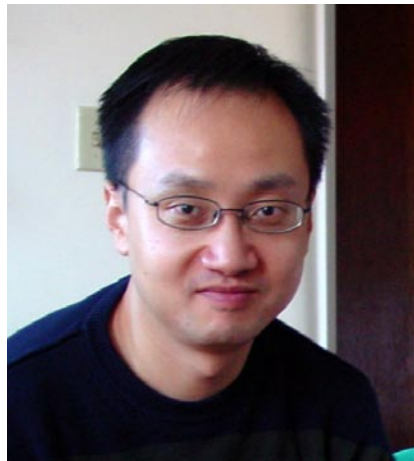
We think of alums, students, staff, faculty of the computer science department as a family. We were very sad to lose two beloved members of our family this year. Steven Judd, an undergraduate student, passed away in November on the eve of his 21st birthday. Steven was a wonderful student who we will remember as an intelligent and very kind young man. Dr. Frank Harary, an emeritus professor at CS-NMSU (for 18 years!) who was known the world over as "Mr. Graph Theory", passed away in January earlier this year at the age of 83. Frank was not only a beloved member of our department and a famous graph theorist but, as any one who had any contact with him tell you, quite an unforgettable character. Through support from the Judd and Harary families, we have established a Steven Judd memorial scholarship and a Frank Harary Endowed Fund which will help us preserve Dr. Harary's office at NMSU as a Research and Reading room. We also plan to start an annual lecture series in Dr. Harary's honor. I encourage you to join us in supporting these or other departmental developmental efforts.

I hope you will enjoy this newsletter and take pride in what your department has been able to accomplish over the last year.



New Personnel

The department is very pleased to welcome a new faculty member, **Joe Song**, (below) who was previously with the City University



of New York. Dr. Song's research is in bioinformatics, and he is the first faculty member to join us under the auspices of the Center for Bioinformatics and Computational Biology.

The center has also hired **Linda Sandoval** (below) as program coordinator for the educational and outreach activities of the Center.



The front office has undergone a complete change. Joining us as Secretary II is **Jenny Lee Griffith** who will supervise work study students **Celia Daggett** and **Tiffany Hamel**. One secretarial position remains open at the time of publication.

3D Virtual Environments

Carmen Gonzales (Vice Provost for Distance Education) has teamed with **Dr. Clint Jeffery** and **Dr. Enrico Pontelli** (both Computer Science) on a 3-year, \$840,000 grant from the National Science Foundation Advanced Technological Education program. Under the grant, a team from Computer Science Department will develop a 3D virtual environment in which distance students can take classes and participate in the NMSU-CS community. The grant is in partnership with Northern New Mexico Community College, Crownpoint Institute of Technology, NMSU Carlsbad and NMSU Grants. ☼

Bioinformatics Lecture Series

New Mexico State University is receiving the Keck Seminar series live from Rice University campus through the efforts of Dr. Jing He and support from the INBRE, ADVANCE and the Center for Bioinformatics and Computational Biology. The Keck seminar speakers are high profile researchers from the six participating institutions in the Texas Medical Center area. The seminars cover a variety of topics such as Advanced Computational Methods & Tools, Biomolecular structure and Function, Imaging and Dynamics, Medical and Genomic Informatics, and Membrane Biology. The seminars are broadcast through internet every Friday afternoon at 3 p.m. either in Science Hall or in Chemistry & Biochemistry building. The organizer for the lecture series is **Jing He**. ☼

ACM Programming Competition

The NMSU ACM Student Chapter had a very successful Student Programming Competi-

tion on Saturday, October 9, with 23 students on 10 teams competing. The students were given four challenging programming problems to complete in four hours; the winning teams were: First Place: **Brandon Nelson, Joel Pfeiffer** and **Evan Powell** Second Place: **Naoman Abbas, Mayur Palankar** and **Sumant Tambe** Third Place: **Jacob Blumberg** and **Kwame Porter-Robinson** Fourth Place: **Sudarshan Gaikawaiari, Samat Jain** and **Mikhail Tadjikov**. ☼

Enrico Pontelli Successes

At the recent Fall convocation, **Enrico Pontelli** was awarded the prestigious University Research Council Award for Exceptional Achievement in Scholarly Activity.

Dr. Pontelli chaired the doctoral consortium at the International Conference on Assistive Technologies, Oct. 18-20, in Atlanta. 6 PhD students participated were selected to participate. He also presented a paper at the main conference. The Computer Science Department at NMSU was one of the sponsors of this conference.

He also has been invited to serve as Program Chair for the 2005 ACM International Conference on Computers and Accessibility (formerly known as International Conference on Assistive



Technologies). The conference is the premier technical event in Computing and Assistive Technologies, and will take place in October 2005 in Baltimore. ☼

Steven Judd Scholarship

We were saddened to hear about the death of one of our students, Steven David Judd. Steven passed away on Nov. 19, a day after his 21st birthday, due to

complications resulting from alcohol poisoning. Steven was a bright student and will be missed. Steven's parents, Steve and Karen Judd will establish a scholarship in the computer science department in his memory. ☼

Board of Regents Visits CS

The Board of Regents of New Mexico State University made a visit Science Hall on May 6th.

2005. They visited each of the three departments that share the building, Computer Science, Psychology and Mathematics. They saw several demonstrations in each area and listened to brief overviews of each department. Computer Science showed off its new wireless computer classroom, and saw demonstrations from **Jing He** on protein structure, **Clint Jeffrey** on his research in virtual environments, and **Jon Cook** who demonstrated the CS273 robots. ☼

Summer Camps for Bioinformatics Students

This last summer saw the first in a series of summer camps for students studying bioinformatics. The camp was organized by the Center for Bioinformatics and Computational Biology, and coordinated by **Linda Sandoval**. 17 local high school students participated in the two-week bioinformatics section of the Summer Camp. The students were from Ocate, Las Cruces, Mayfield, and Mesilla Valley Christian High Schools. Among the high school students were 10 females and 7 males. The 12 college students attending the camp were from Taos Vocational Institute, San Jose Community College, Santa Fe Community College, Crownpoint Institute of Technology, Northern New Mexico Community College and Dine College. In an effort to adhere to grant guidelines, minorities in the Native American, female and Hispanic categories were invited to attend. Among these students, 4 were female Native American students and 1 male Native American. There were 4 Hispanic males and three Caucasian.

Both groups collaborated during the bioinformatics section of the camp. The event culminated with a research poster presentation involving peers and the university community. At the end of Summer Session II, President **Michael Martin** presented the college students with certificates of achievement. ☼

The picture shows the college students with faculty members **Ranjan** (4th from left), **Pontelli** (8th from left) and **Jeffery** (7th from left), and graduate student **Chito Chavez** (10th from left)



Pathways: A Student-Centered Approach to Educational Success

The NMSU Computer Science Undergraduate Pathways Program is aimed at recruiting and retaining underrepresented minorities in Computer Science. Pathways program is supported by a Minority Institution Infrastructure Grant from the National Science Foundation.

“We would like our students to not only successfully earn a bachelor’s degree in Computer Science, but also be successful in the work place or in continuing their education,” said Pathways coordinator **Nemecio Chavez** who is also a Ph.D. candidate in the computer science department. “That’s our ultimate goal.”

The Pathways Program provides support, challenge, and opportunities to undergraduate students in the program to meet this goal.

“Student input was a major factor in building the program,” said Chavez. “Students have a wide-ranging number of concerns that need to be balanced in order for them to be successful within an educational environment.”

These concerns range from academic to cultural to financial. In an effort to directly address them, the Pathways program offers academic support and challenges in individual and group formats, employment opportunities, faculty and peer mentoring, and uses a team oriented framework for its organization to ensure cohesiveness between each of the individual working components.

“Focus groups and tutoring are the core of our program,” said Chavez. “Students get support for the classes they historically have the most difficulty with.”

Now entering its third year, the Pathways Program has been expanded to include workshops that focus on general issues such as test taking skills

or on in-depth field related topics. Social events designed to build bonds and trust amongst the students, and to allow them to network with faculty have also been added. Most importantly to help build a sense of community, student involvement has increased. ☼

Scholarship Grant Awarded

A \$400,000 scholarship grant from the National Science Foundation was awarded jointly to Computer Science, Engineering Physics and the College of Engineering. The CSEMS program of the National Science Foundation is geared towards providing undergraduate scholarships to talented and financially needy students in computer science, engineering and mathematics. It is expected that about 30 \$3,000 scholarships will be awarded per year for the four years of the duration of the grant. The grant will also support workshops and other activities that will help assist the awardees in their academic endeavors. Dr. **Jonathan Cook** (below) from Computer Science is a co-PI for the grant. ☼



New Center Formally Opens

A formal opening ceremony for the Center for Bioinformatics and Computational Biology was

organized and hosted by the Computer Science Department on Wednesday, September 1st, 2004. **President Martin, Provost Flores, Dean Cruzado-Salas** and the Center Director, **Dr. Desh Ranjan** spoke briefly at the function. The gathering was attended by over 60 faculty members, students and administrators from across the University. ☼

Graduate Student IS NMSU Ambassador

Yu Pan, a Ph.D. student in the Computer Science Department, has been selected as an ambassador in the NMSU Graduate School Student Ambassadors Program for the 2004-2005 school year. Ambassadors



are outstanding graduate students from different colleges, cultures, and countries who represent the Graduate School at a variety of functions, and also give tours to potential students on campus. ☼

Grace Hopper Conference

A contingent of eight faculty members and graduate students from the Computer Science Department attended the Grace Hopper Celebration of Women in Computing in Chicago. The faculty members attending are **Dr. Roger Hartley, Dr. Inna Pivkina** and **Dr. Karen Villaverde**.

The graduate students attending were **Melanie Martin, Nina Javaher, Iris Chavez, Rajaa Shindi and Cameron Mott**. The Grace Hopper Celebration of Women in Computing 2004 was the fifth in a series of conferences designed to bring the research and career interests of women in computing to the forefront. Presenters are leaders in their respective fields, representing industrial, academic and government communities. ⚙

CS Hosts Campus-wide Programming Competition

On March 5th, the Computer Science Department hosted and co-sponsored a large programming contest. The competition was held in four different categories – Open Platform Competition, Object-Oriented Competition and Database Competition and a Security Competition. The event was an outstanding success with more than 25 teams and 50 students from departments in three different colleges participating. Other sponsors of the event included the professional societies ACM, IEEE and AITP, Microsoft, Argo Data, the College of Business and the College of Engineering. ⚙

NSF Fellowship Grant Awarded

A joint proposal submitted by CS-NMSU and Iowa State University to the National Science Foundation - Integrated Graduate Education, Research and Training program has been selected for funding. NMSU and ISU will be awarded 2.9 million dollars over five years to support graduate research training activities jointly at Iowa State University and New Mexico State University. Through this 5-yr award, 8 generous 2-yr fellowships will be made available to graduate students at NMSU pursuing a graduate degree in bioinformatics. ⚙

COG Manager Wins Award

Ivan Strnad (below), the department's manager of the Computer Operations Group, was recognized with the First Light Credit Union professional employees award at the Fall Convocation. Ivan has worked in the group for seven years, and has



been manager for the last five years. He has dedicated himself to the upkeep and maintenance of the department's computer network, and has been a tireless advocate for continual upgrading to the best possible equipment. ⚙

University gets new logo

You may have noticed the new NMSU logo on the front page. The changeover happened this Fall, after over may decades of using the old 'centered triangle' logo, which symbolized the interdependency of teaching, research and service. The new one is more instantly readable according to its advocates. Below are the old symbol with the new one. You be the judge!



Departmental Scholarships

The department now has several scholarships fully endowed, and will be awarded annually. These are: **Richard H. Stark Scholarship**, **Steven Judd Scholarship**, **Brandy Streit Scholarship**, **Patricia D. Lopez Scholarship**. In addition, the **Founder's fund**, named for the department's founders, is also fully endowed. The founders were **J Mack Adams, Don Dearholt, Pasha Hussein, Johnny Johnston, and Dick Stark**. ⚙

Professor, students participate in State Bioinformatics Symposium

Dr. Jing He (below), assistant professor, five graduate students (**Kalyan Gopavarapu, Yonggang Lu, Shaik Nooruddin, Yu Pan and Tu Phan**) and two undergraduate students attended the New



Mexico Bioinformatics symposium in Santa Fe. Several of the students presented posters based on their research work at the symposium. The NMSU Center for Bioinformatics and Computational Biology co-sponsored and helped organize the symposium. ⚙

Obituary

Frank Harary 1921-2005

Dr. Frank Harary was born on March 11, 1921 in New York City. He obtained his Bachelors and Masters degrees from Brooklyn College and his doctorate from University of California at Berkeley in 1948. For close to forty years, he was a faculty member in Mathematics at the University of Michigan where he was also a member of Institute of Social Research from 1950 to 1982. He was a Distinguished Professor, and later Distinguished Professor Emeritus, in the Computer Science Department at New Mexico State University in Las Cruces from 1987 until the time he passed away.

Dr. Harary was widely recognized as one of the pioneers of modern graph theory, a discipline of mathematics he helped found, popularize and revitalize. His book titled "Graph Theory" that was published in 1969, is a modern classic that helped define, develop, direct and shape the field of modern graph theory. It is one of the most cited and influential scholarly works in modern scientific literature. Dr. Harary taught what were the first graph theory and combinatorial theory courses ever in 1955 at University of Michigan. He was also the founder of Journal of Combinatorial Theory and Journal of Graph Theory and served on the editorial boards of many more. During his long and productive career, Dr. Harary authored or coauthored more than 700 scholarly papers in areas as diverse as Anthropology, Biology, Chemistry, Computer Science, Geography, Linguistics, Music, Physics, Political Science, Psychology, Social Science and of course Mathematics. These papers brought forth the usefulness of Graph Theory in scientific thought. Dr. Harary guided 16 Ph.D. students many of whom have gone on to be distinguished scholars themselves. Dr. Harary was a recipient of many national

and international honors including the Distinguished Alumnus and Lifetime Achievement awards from Brooklyn College and honorary doctorates from five universities in different countries - University of Aberdeen, Scotland, University of Lund, Sweden, Uni-



versity of Exeter, UK, University of Macedonia, Thessaloniki, Greece and University of Louisville in Kentucky. He was to receive a sixth doctorate from University of Calcutta, India earlier this year but unfortunately that did not come to pass. Dr. Harary was also a fellow at Oxford and Cambridge Universities, an honorary fellow of Indian National Academy of Sciences and Vice-President of the Calcutta Mathematical Society. He loved to travel all over the globe to spread the gospel of graph theory. In all, he delivered over a thousand conference and invited lectures in more than 87 countries in four different languages. Dr. Harary was a true scholar with a genuine love for graph theory which was an endless source of new discoveries, beauty, curiosity, surprises and joy for him till the very end of his life. For his numerous contributions to the field, Dr. Harary was fondly

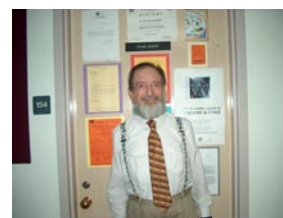
referred to as "Mr. Graph Theory" by his colleagues, peers and students.

But, we will be remiss if we member Frank only as Mr. Graph Theory. Frank was much more than a graph theorist. Although graph theory may have been his first love, Frank loved life. He had a great sense of humor, he loved music, art, dancing, poetry, traveling and much more. He enjoyed classical music greatly - if you went to his office in the afternoon you could see him listening to the classical music on NPR while he read or replied to his e-mail. He was extremely fond of the art of M.C. Escher, an art that has its roots in fanciful world of mathematics - especially duality and recursion. He had a great collection of Escher's work and often wore ties with Escher designs. He was an avid dance enthusiast and danced every week even in the last year of his life. He loved poetry, and even indulged in writing some although not of the serious type. He once commented about his poems "They all share three common characteristics - they all rhyme,

they are all true and they are all silly". Frank was also a wine connoisseur. He had a tremendous collection of wine and other stronger alcoholic beverages, which he loved to share with friends.

And finally, Frank loved to travel the world and share stories and jokes. Quite simply put, Frank was a colorful "character", a character we loved to be around and have around.

An endowment fund in Frank's name has been started with a generous donation from his family. It is hoped that we can preserve his office in the corner of Science Hall as a reading room and library.



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