

Computer Bytes



**Computer Science Department
New Mexico State University**

Fall 2004



CS Department Leads Bioinformatics at NMSU

New Mexico State University has received a five-year, \$4.5 million grant from the National Science Foundation to establish a new center that will focus on the emerging field of bioinformatics. It will be the first such research center in New Mexico.

Bioinformatics, or computational biology, involves the application of information technology to the understanding of biological processes. It has implications for a variety of fields, including medicine, agriculture and homeland security.

“Right now biological data is accumulating at a rate that outpaces the development of computational tools to analyze it,” said **Desh Ranjan**, head of the department of computer science at NMSU. An example of this, Ranjan said, is the Human Genome Project, in which DNA sequences are accumulating faster than researchers can figure out what they mean.

Goals of the new center include developing software that can help biologists in their studies and training students for careers in bioinformatics.

“We need people who are skilled in working with data

as well as the underlying science,” Ranjan said. “There is a huge shortage of such people nationwide, even internationally.”

Ranjan said NMSU plans to offer a master’s degree program in bioinformatics in about two years and eventually a Ph.D. program. It also plans to offer a variety of activities designed to interest high school students in pursuing careers in bioinformatics. A major goal of the center is to increase the number of minorities in the bioinformatics profession.

The new center will draw together researchers from the departments of computer science, biology and biochemistry, and agronomy and horticulture. In addition to Ranjan, who will serve as director of the center, researchers who will be involved with the center include **Brook Milligan**, associate professor of biology; **Mary O’Connell**, professor of agronomy and horticulture; **Jing He**, assistant professor of computer science; and **Enrico Pontelli**, associate professor of computer science.

Initial research projects that will be conducted at the center include: “Development of computer tools that will make it easier for biologists to determine which

family tree organisms belong to. Correct classification of organisms is critical for diagnosis and treatment. For example, good bioinformatics tools enabled researchers to quickly understand the threat posed by the SARS virus.

“Development of an information management system to organize data that has been gathered on the hantavirus in Paraguay. Better organization of molecular, environmental, ecological and geographic information could help predict where the virus might hit next. This research could serve as a model for studying other emerging diseases.

“Development of computational tools to help understand the biological function of genes in organisms such as chile peppers and alfalfa. This information could help researchers develop plants that are resistant to certain diseases or enable them to develop new flavors of food crops such as chiles.

“Development of computational methods to study the three-dimensional structure of proteins. This is critical to understanding the role of proteins, which are responsible for nearly every function required

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

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Message from the Chair

The computer science department at New Mexico State University is almost forty years old. It first started off as a masters program, mostly through the efforts of a few visionary professors, as an off-shoot of what was then the Computer Center.



Since then the department has come a long way but has never wavered from its mission of pursuit of excellence in computer science research and education. Today, the department offers Bachelors, Masters and Doctoral Programs in Computer Science and continues to be committed to providing the students high-quality educational and research training to ensure their success in academia and industry.

The department has over 225 undergraduate majors and one of the largest graduate programs in the University with more than 110 graduate students. The success of our alumni, who have gone on to productive careers in industry and academia, is a testimony to the quality of our programs.

Last year has been a particularly good one for the department. The department led the successful effort to set-up an inter-

disciplinary Center for Bioinformatics and Computational Biology through a \$4.5 million grant from National Science Foundation.

Computer Science happens to be in a fortunate situation of being able to effect the enhancement of knowledge in many other fields in a significant way. We expect this to be only the beginning of the inter-disciplinary efforts that the department will participate in over the coming years.

We are also in the process of starting up a new Distance Education initiative through major support from NSF. Through the ongoing NSF Minority Institution Infrastructure grant, we have set up a new state-of-the-art teaching classroom and have built and sustained an effective PATHWAYS program that provides support for students in gateway computer science courses. In addition, individual computer science faculty members and students have been recognized for excellence through awards within the university and at international forums.

Our alumni and friends have provided us with financial resources to set up two new scholarships for students and we expect to be able to start two more next year.

Through hard work and support from our alumni and industrial partners over many years, the computer science department has developed into an excellent and a friendly place to seek education and conduct research in computer science.

We continue to strive for excellence in education, research and research training and look forward to another exciting year ahead.

Desh Ranjan

Student Programming Competition

The NMSU ACM Student Chapter had a very successful Student Programming Competition 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 Ramakant Palankar** and **Sumant Uday Tambe**. Third Place: **Jacob Blumberg** and **Kwame Porter-Robinson**. Fourth Place: **Sudarshan Gaikawaiari, Samat Jain** and **Mikhail Tadjikov**.

The first, second, and fourth place teams will be representing NMSU at the Rocky Mountain Regional Collegiate Programming Competition at the New Mexico Institute of Mining and Technology on Friday and Saturday, October 29 and 30. The winner of that competition will go on to compete at the 2005 ACM International Collegiate Programming Competition at Shanghai Jiao Tong University in Shanghai, China. ❖

Early Career Award

Dr. Son Cao Tran, who is an Assistant Professor in the department has been awarded the University Research Council's early Career Award for his work in the application of logic programming techniques to automated planning. Dr. Tran has been at NMSU

since January 2001 and has already over twenty publications to his name, written while at NMSU. He has also been a part of three successful grant proposals, and has taken part in



Son Tran

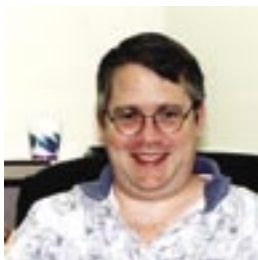
many conference committees and workshops.

He was joint author on paper that won the best paper award at the Universal Accessibility Conference last year. This work involves research on computer interfaces for the blind. He received his award, a check for \$2,000, from the president at the Fall Convocation. ❖

Collaborative Environments for Distance Education

NSF has awarded \$840,000 to NMSU for establishing a virtual community for computer science education, under their Advanced Technological Education program.

The three year grant funds



Clint Jeffery

the creation of a virtual version of NMSU's CS Department, and is a collaboration between CS faculty **Clinton Jeffery, Enrico Pontelli, and Karen Villaverde**; the NMSU office of distance education; and participating 2-year colleges in New Mexico.

Students (and possibly alumni and other guests) will be able to walk around in a 3D environment similar to a video game, visit professors in their virtual offices, chat with other users, work on programming projects in teams, and attend seminars and classes with audio and selected video captured from the real world.

The 2-year schools involved are Northern New Mexico Community College, Crownpoint Institute of Technology, and NMSU Grants and Carlsbad campuses. ❖

Professor wins teaching award

Assistant Professor Inna Pivkina received the award for most hours logged with the Teaching Academy in this academic year.

Professor Pivkina joined the department in 2002 and has



Inna Pivkina

taken advantage of the program offered by the Academy in order to learn how to become a good teacher. Inna received a plaque from Provost Flores in a ceremony attended by over a hundred people. ❖

Grace Hopper Conference for Women in Computing

A contingent of eight faculty members and graduate students from the Computer Science Department represented the department at the Grace Hopper Celebration of Women in Computing in Chicago.

The faculty members attending were Dr. Roger Hartley, Dr. Inna Pivkina and Dr. Karen Villaverde. The graduate students attending 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. ❖

New Endowed Scholarships

Two new scholarships were endowed recently. The first is in memory of **Brandy Streit**, an alumna of the department who tragically died in March of this year. Mr. and Mrs. Streit, her parents, will award a scholarship in the amount to be determined every year to a deserving undergraduate.

The other scholarship was endowed by **Patty Lopez**, our mentor and friend at the HP corporation, and her husband. The scholarship, in the amount of \$3,000 will be shared with the Engineering college. ❖

Alumni win Excellence Awards

Tim Stone, a Computer Science alumnus, has been awarded the W.Y. Smith Award for Excellence at the Institute for Defense



Analyses in Alexandria, Virginia.

The award is also acknowledged to be for employee of the year. The photograph shows Tim receiving the award in a recent ceremony from Admiral Dennis Blair, the president of the Institute. His letter of commendation includes the following: "Mr. Stone has been a valuable member of the Simulation Center since joining IDA in 1996. Not only has he been involved in SCTR efforts, but he also has contributed to several cross-divisional projects.

Mr. Stone has truly excelled in each of the technical and analytical tasks he has completed over the last seven years. He has made an important contribution toward enhancing IDA's reputation for quality and professionalism". ❖

Jesus Mirales, now a software developer with Lockheed Martin, was part of a team that won the 2004 Team excellence award, and the 2004 Novas award, the corporation's most prestigious award. The team's work is for DEVNET, a web-based service for software developers across the whole corporation. The DEVNET has greatly reduced Air Force customer's costs, and timelines for the

development of third party software products. The project has provided significant cost and schedule savings, in excess of \$2 million. ❖

New Scholarships for Undergraduates

The department, with the College of Engineering and the Engineering Program, has been awarded a grant of \$400,000 by the National Science Foundation for the creation of 30 undergraduate scholarships a year over four years. The scholarships will be awarded on a competitive basis, depending on a student's academic performance record and financial need.

The grant will also support workshops and other activities that will help the awardees in their academic career. **Jonathan Cook** as a co-PI for the grant. ❖

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for life. Knowledge of protein structure will help researchers design drugs to cure diseases caused by abnormal protein structures. Sickle cell anemia, for example, is caused by one faulty amino acid in a protein.

Waded Cruzado-Salas, dean of the College of Arts and Sciences at NMSU, noted that this new center falls within one of the six areas that have been identified for strategic research focus at the university: information sciences.

"The establishment of this center is a major achievement and represents the successful implementation of one of our research thrusts," Cruzado-Salas said. "It is a comprehensive project with great potential to benefit New Mexico and beyond." ❖

Giving back to the department

Fifteen years ago, the Computer Science department had one VAX minicomputer (remember those?) and a bunch of terminals. Punched cards were still in use in the computer center.

Now we are in a new building, with hardware that is the envy of many computer science departments. We have a large laboratory for teaching, and special labs for graduate students and research programs. We are putting the finishing touches to a state-of-the-art computer classroom. Every teaching assistant has an up-to-date machine, and every faculty member has a fast workstation on his desk.

So are we happy? Well, yes ... and no. Maintenance of this large network

of heterogeneous platforms (Linux, Solaris, SunRay, Mac, Windows) is a technical nightmare for our computer operations group. Monitors wear out, disk drives crash, machines break, networking cable dies. It all requires money to keep the system going at full strength.

In addition to hardware maintenance costs, we want to maintain an active colloquium program, to run a local job fair every semester, and to keep our advisory board at full strength. All these costs are extra to our regular budgets for teaching and administration.

What is more, faculty, staff and students deserve more money than the state provides. The whole IT business is still strong, despite the downturn in the economy and the demise of many dot coms but we often get left out of the picture by the state legislature. However, we are actively exploring

the possibility of getting the formula funding from New Mexico changed to give CS more money. Also we are constantly pushing at the Dean and the administration to raise salaries and make the department more competitive. We are always trying to help our students with more and better scholarships to enable them to finish their degrees and go and get a wonderful job.

You can also play your part by donating as much as you feel you can give to the department. Your donation will be greatly appreciated and we guarantee that it will be used wisely, for the well-being of the department. Whether your donation goes to scholarships, or a general departmental fund, or you would like to earmark it for some special project, we will take care of your money. Thank you for your support! ❖

Please photocopy and cut out this form to return with your gift.

Name:	Graduation year (if applicable):	

Address:		

City:	State:	Zip Code:

Phone:	eMail address:	

Yes, I want to help the Computer Science department at NMSU. Enclosed is my check for:

_____ \$1000 _____ \$500 _____ \$250 _____ \$100 _____ \$50 _____ \$25 _____ \$10 _____ other

I want my gift to benefit:

Richard H. Stark Scholarship _____ Founders' Endowment Fund _____
General Scholarships _____ Equipment maintenance _____ Software upgrades _____
Laboratory equipment _____ Other - please specify _____

Please make you check payable to the NMSU Foundation and mail it to
Desh Ranjan,
New Mexico State University,
Department of Computer Science,
PO Box 30001 MSC CS, Las Cruces, NM 88003-0001

Obituary

Don Dearholt

It is with great sadness that we report the death last November of **Don Dearholt**, one of the founders of the department, after a brief illness.

August of that year. In 1968, he and several other NMSU faculty started efforts to form a computer science department. He had a joint appoint-

one of his favorite things about NMSU was going to the gym at noon to run with his friends.

Don had many interests out-



Don was born in Roswell, NM in 1936 and graduated from Roswell High School in 1954. He went to UNM for his BS and MS degrees in Electrical Engineering. While he was there, he played trumpet in the UNM band which provided him with a scholarship to pay for school. In his spare time at UNM, he enjoyed building radios as well as electronic gadgets to jam radios which were being played too loudly in neighboring dorm rooms. In 1960, he moved to Washington State where he attended University of Washington. Don taught as an instructor there and finished his doctorate in 1965 in electrical engineering. He was married in Washington and moved to Las Cruces to start teaching in the electrical engineering department at NMSU in

ment with EE and CS until 1980 at which time he moved over to CS full time. In the late 1980s, he was acting department head of CS. In 1990, he retired from NMSU and moved to Starkville, MS where he was department head of CS at Mississippi State University. He stepped down from that job in 1997 and returned to being a full professor at NMSU. Don moved back to Las Cruces in the summer of 2000. His interest in research continued and so he worked from an office in the NMSU CS Department until the Fall of 2003.

He enjoyed teaching and being around the students tremendously. He also liked his research collaborations and meeting people who were involved in engineering and science. In addition to the people he met academically,

side of the academic world including hiking, running, shooting, hunting and exploring the desert in his Jeep. In the last fifteen years of his life, he was involved in Sierra Club both in

Mississippi and New Mexico. In addition to dealing with the issues of environmental policy, he enjoyed going on hikes with the local Sierra Club members. In the last decade, his interest in music returned and he became a member of the Mesilla Valley Concert Band. He also attended a number of band camps to learn to play better with large groups of people.

He will be sorely missed by his children and by the many friends and colleagues at NMSU and Mississippi State. ❖

CS Faculty

Desh Ranjan, Department Head, Professor
Amiya Bhattacharya, Assistant Professor
Jonathan Cook, Associate Professor
Roger T. Hartley, Associate Professor
Jing He, Assistant Professor
Clinton Jeffery, Assistant Professor
Hing Leung, Associate Professor
Joseph J. Pfeiffer, Jr, Assistant Professor
Inna Pivkina, Assistant Professor
Enrico Pontelli, Associate Professor
Esther Steiner, College Professor
Son Cao Tran, Assistant Professor
Karen Villaverde, College Assistant Professor

Adjunct, Part Time, Emeritus Faculty

Richard Dale, College Associate Professor - Part Time
D. Hue McCoy, College Professor - Part Time
J Mack Adams, Professor - Emeritus
Frank Harary, Distinguished College Professor - Emeritus
John B. Johnston, Professor - Emeritus
Richard H. Stark, Professor - Emeritus
Gopal Gupta, Professor - Affiliated
Arthur I. Karshmer, Professor - Affiliated
Janyce M. Wiebe, Associate Professor - Affiliated
John Barnden, Professor - Affiliated
Shaun Cooper, Assistant Professor - Affiliated
Jim Cowie, Professor - Affiliated
William Ogden, Affiliated
Ron Zacharski, Affiliated

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Josette DeLette, Secretary II - Computer Science Office

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Mikhail Tadjikov, President, ACM Student Chapter

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