We have crossed the finish line of another great year at Duke. On graduation weekend we greeted parents of 43 new B.S. and B.A. graduates as well as 47 second majors in computer science. Outstanding graduates include David Arthur, who placed well in the national Putnam Mathematics Competition, and Ethan Eade, who received a Marshall scholarship for two years of graduate study at Cambridge University. We also graduated 17 M.S. students and 7 Ph.D’s. All will be heading off to promising careers in academia, industry, or research.

For our faculty, the National Science Foundation CAREER awards for young scholars keep rolling in and every one is a tremendous honor. This time the trumpets play for Alexander Hartemink whose work will concentrate on automatically learning the networks for biological regulation and control. We also have received news that one of our recent graduates, Joyce Chai, has received this honor at her new position at Michigan State University.

Our nanotechnology projects have been flowering under the direction of John Reif and Alvin Lebeck with Dan Sorin and Chris Dwyer of Electrical and Computer Engineering as collaborators. (Welcome Chris to the ranks of regular faculty in ECE.) John was the Chair of the recent Foundations of Nanoscience: Self-Assembled Architectures and Devices (F•NANO) at Snowbird, Utah where many of the major scholars in nanotechnology gathered to present recent research results. These projects are pioneering methodologies for synthesis of molecular scale structures for a variety of applications.

We will soon be welcoming Dr. Kamesh Munagala to our faculty after he completes his postdoctoral position in computational biology at Stanford. Kamesh is an expert on optimization problems that arise in such domains as computer networks and computational biology. We have other offers out and hope to be able to announce soon more additions to our faculty.

We celebrate the many accomplishments of our departmental staff. Susan Clear was recently honored by the President of Duke University for her service above and beyond the call of duty as Assistant to the Chair. Please keep us abreast of your news when exciting things happen and be sure to check out our Web site.

Alan Biermann, Chair

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Susan Clear Awarded Meritorious Service Award

Susan Clear, Assistant to the Chair, was selected to receive a Meritorious Service Award in the 2003 Presidential Awards in the Clerical/Office Support Category.

Alan Biermann stated, “Susan is being honored in part for utilizing technology to upgrade department procedures. Specifically, she created the very successful on-line system for receiving and managing faculty applications, she organized the chair and other admin folks to use an automated calendar system, and she has been getting significant departmental documents on-line for fast retrieval as needed. Susan has also been exquisitely exacting and very caring in handling numerous personnel issues that are handled by the Chair’s office. Susan has undertaken an endless list of other departmental duties for the well-being of us all.”

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Jeff Phillips and David Arthur Awarded NSF Fellowship

We are pleased to announce that Jeff Phillips and David Arthur have been awarded an NSF Fellowship.

Through this program the National Science Foundation (NSF) seeks to ensure the vitality of the human resource base of science, mathematics, and engineering in the United States and to reinforce its diversity.

NSF Fellows are expected to contribute significantly to research, teaching, and industrial applications in science, mathematics, and engineering.

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David Arthur Ranks 9th in the Nation

The William Lowell Putnam Mathematical Competition is an annual contest for college students established in 1938 in memory of its namesake. Cash prizes for the top five teams in recent years ranged from $25,000 to $5,000. Recent cash prizes for the top five individuals have been $2,500 each.

Over the years many of the winners of the Putnam competition have become distinguished mathematicians. A number of them have received the Fields Medal and several have won the Nobel Prize in Physics.

For the fourth time in five years, a team of Duke students placed third in the competition, held December 6. David Arthur ranked 9th in the nation for completing eight problems.

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- Page Two: Lars Arge Promoted to Associate Professor of Computer Science
- Page Four: Scientists Turn DNA Tubes into Nanowires
- Page Six: Congratulations to Our Graduates
Lars Arge Promoted to Associate Professor of Computer Science

Duke University has recognized the efforts of Lars Arge with a promotion to Associate Professor.

“I came to Duke in 1996 to take a Post Doc position with Professors Panikaj Agarwal and Jeffrey Vitter, thinking I was only going to be here for one year before returning to Europe. I am still here, thanks to their world-class mentoring and the incredible scientific environment of the strong algorithms group, and I am excited to have now reached this major career milestone,” said Arge.

Arge’s research focuses in the area of memory-hierarchy efficient algorithms, especially I/O-efficient algorithms for problems involving massive datasets. Arge has received several NSF grants to develop I/O-efficient algorithms with applications in spatial databases and Geographic Information Systems. Most recently, he received a grant to design so-called cache oblivious algorithms; Algorithms designed to perform well on hierarchical memory systems. As part of a collaboration, Arge recently designed an I/O-efficient algorithm to help researchers in the School of Environment compute hydrologic flow accumulation in the Appalachian Mountains. The algorithm enabled the environmental researchers to complete the computation in a few hours versus a couple of weeks. The algorithm has since been refined and packaged in a software package called “TerraFlow”, and is used by many environmental researchers to process and analyze massive terrain data.

Department Chair Alan Biermann states, “Lars is a world leader, perhaps the world leader, in I/O efficient large-scale computing. We are very fortunate to have him on our faculty and we certainly congratulate him for his many achievements.”

Foundations of Nanoscience: Self-Assembled Architectures and Devices Conference

A missing pillar in the emerging discipline of Nanoscience is an understanding of self-assembly methods for forming complex structured components. For a variety of historical reasons, self-assembly processes and experiments have not been examined by science to the degree that is now needed by Nanoscience.

Foundations of Nanoscience was intended to have a major impact on the emerging field of nanoscience and self-assembly — for the first time ever, the conference provided a synergism for a community of scholars working in self-assembly related areas who would otherwise not have contact with each other. The schedule of events included 71 Invited Speakers & Track Chair Talks.

“The Foundations of Nanoscience Workshop was simply the very best symposium in this area that any of us has attended. It was exceptional in the breadth of subjects covered, the depth and sophistication with which they were explored, and the uniform excellence of the presentations”, Professor Daniel Morse, UCSB.

The conference was sponsored by Defense Advanced Research Projects Agency (DARPA) and held at Snowbird Cliff Lodge, Snowbird, Utah on April 21-23, 2004. A. Hollis Edens Distinguished Professor of Computer Science John Reif, was program chair of the event.

Computer Science Department Receives Best Recycling Department Award

The Duke University Environmental Management Advisory Committee (EMAC) has chosen the Computer Science Department to be this year’s recipient of the Best Recycling Department Award. Of particular note was the initiative by Computer Science to be at the forefront of double-sided printing many years ago, by making double-sided printing the norm along with our strong recycling program.

President George W. Bush awarded the Computing Research Association’s Committee on the Status of Women in Computing Research CRA-W the 2004 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM) for “significant achievements in mentoring women across educational levels.” The current CRA-W co-chairs are Carla Ellis (Duke University) and Mary Jean Harrold (Georgia Tech).

The award cites CRA-W’s work providing “hands-on research experiences, mentoring, role models and information exchange to women pursuing careers in [the] field.” CRA-W programs seek to increase the number of women involved in computer science and engineering, increase the degree of success they experience, and provide a forum for addressing problems that often fall disproportionately within women’s domain.
Scientists have recruited DNA to manufacture minuscule wires that could be used for nanoscale electronic devices. According to a report published online this week by the Proceedings of the National Academy of Sciences, tiny tubes that self-assemble can be coated in metal to form highly conductive wires. Thomas LaBean of Duke University and his colleagues first assembled tiles from synthetic DNA molecules, which they used as building blocks. Under the right chemical conditions, these tiles arrange themselves into tubes that measure just 25 nanometers in diameter and up to 20 micrometers in length. (The new process improves on previous assembly methods, which resulted in tubes of greatly varying lengths and some left over tiles.) The scientists then created smooth, uniform silver nanowires from the tubes through a two-step chemical reaction.

The benefit to utilizing DNA to assemble nanotechnology lies in its specificity. Because DNA bonds according to well-understood base-pairing rules, the scientists hope to exploit it in order to place nanowires at precise locations on a relatively large chip without having to directly manipulate them.

Scientists Turn DNA Tubes Into Nanowires

FRONTIERS CONFERENCE

Targets Research Possibilities

New meeting allows researchers to share ideas with industry leaders

In a first-of-its-kind event, a variety of science and engineering faculty stood before an audience of company representatives and others to give a day’s worth of presentations on interesting and potentially marketable research under way at Duke.

Called Duke Frontiers 2004, the invitation-only session May 4th at the Levine Science Research Building’s Love Auditorium attracted nearly 40 representatives of companies ranging from pharmaceutical giants to local startups. They met with university leaders and scientists eager to discuss the prospects for collaboration.

During sessions moderated by different deans, faculty members from several Duke schools presented brief talks on a variety of research that’s both interesting and potentially open to industrial spin-offs.

Among the day’s talks was a presentation by Alexander Hartemink, assistant professor of computer science at Duke University, who has been awarded a Faculty Early Career Development (CAREER) Award from the National Science Foundation (NSF).

The Faculty Early Career Development (CAREER) Program is a foundation-wide activity that offers the most prestigious awards for new faculty members given by the NSF. The CAREER program recognizes and supports the early career development activities of those teacher-scholars who are most likely to become the academic leaders of the 21st century. CAREER awardees are selected on the basis of career development plans that effectively integrate research and education within the context of the mission of their institution.

“I am delighted to be receiving this award from the NSF, and I am excited about the advances to both my research and teaching plans that the award will enable. I am very thankful to have been recognized because I am sure there were many other deserving applicants,” stated Hartemink.

As part of the award, NSF will provide $487,344 in funding over the next five years. Hartemink will use the award to support his research and teaching in computational genomics.

Alexander Hartemink, assistant professor of computer science at Duke University, has been awarded a Faculty Early Career Development (CAREER) Award from the National Science Foundation (NSF).

“I am very thankful to have been recognized.” - Hartemink

Alumni News

Congratulations to our newest alumni! If you have not done so already, please take a moment to fill out our on-line Alumni Registration form.

Ms. Meredith Rae Miller (Class 2004) is the winner of our 2004 Computer Science Alumni Raffle. She won an official Duke University diploma frame.

2002
Jennifer N. Partin (b.a.)
Registered Representative
Mullins Wealth Advisors
New position

1999
Sarah C. Hafer (b.a.)
Quality Assurance Analyst
Wise Solutions, Inc. (Altiris)
New position

2000
Heather W. Swagart (b.a.)
AVP - Sales
J.P. Morgan Chase & Co.
New position

1999
Joyce Chai (m.d.)
Assistant Professor
Michigan State University
Recipient of NSF CAREER award

Spring Picnic

On Saturday, April 3rd, the Department of Computer Science held its annual Spring Picnic at West Point on the Eno. Although it was a chilly spring day, everyone had the opportunity to get acquainted with our prospective student visitors and enjoy good food. There was also some serious competition in the annual Ultimate Frisbee match.

As part of the award, NSF will provide $487,344 in funding over the next five years.

As part of the award, NSF will provide $487,344 in funding over the next five years.
Congratulations

GRADUATES

Megan Ariel Murphy
William Langdon Moore
Meredith Rae Miller
Luke Joseph McCammon
Matthew John Matuska
John Paul Marnell
Melissa Joanne Chan Lim
Jordan Norman Kramer
Phillip King
Ji-Myung Kim
Anthony CherLan Kang
Samuel Draper Hummel
Diana Shin-Mei Huang
Michael P. Hominick
William Peter Guarnieri
Cem Goncu
David Todd Goldberg
Sanjay Jayant Ginde
Megan Rose Gessner
Leonardo Ernesto Franco
Anne Mary Feldman
Ethan Duff Eade
Christopher James Douglas
Ethel Duff Eade

First Majors
James Richard Berg
Ross Grant Bierbryer
Susan Elizabeth Boehm
William Howard Boyd
Phillip Wren Brooks
Douglas C. Carlson
Patrick Chan
Drew McCutchen Clary
Lauren Rebecca Collett
Wesley Eugene Derbbery
Christopher James Douglas
Elan Duff Eade
Anne Mary Feldman
Leonardo Ernesto Franco
Megan Rose Gessner
Sanjay Jayant Ginde
David Todd Goldberg
Cem Goncu
William Peter Guarnieri
Michael P. Hominick
Diana Shin-Mei Huang
Samuel Draper Hummel
Anthony CherLan Kang
Ji-Muang Kin
Phillip King
Jordan Norman Kramer
Melissa Joanne Chan Lim
John Paul Marnell
Matthew John Matuska
Luke Joseph McCammon
Meredith Rae Miller
William Langdon Moore
Megan Ariel Murphy

Undergraduate

Alex Vasilos Memorial Award

Jonelle Stovall

Friends and colleagues of the late Alex Vasilos donated the Alex Vasilos Memorial Award to the Department of Computer Science to recognize deserving students for their excellence in academic achievement and undergraduate program support.

Senior Thesis Project

Graduation with Distinction
Megan Gessner:
- Generation of Spanish Verb Conjugations

Megan Murphy:
- The Uses of Pair Programming in Introductory Computer Science

Alex Vasilos Memorial Award

Jonelle Stovall

Friends and colleagues of the late Alex Vasilos donated the Alex Vasilos Memorial Award to the Department of Computer Science to recognize deserving students for their excellence in academic achievement and undergraduate program support.

OUTSTANDING

Undergraduate Teaching Assistant Award

Andrew Van Kirk

The award is presented to a graduating major in recognition of his/her achievement in leadership.

DOCTORATE

Degrees Conferred September 2003

Jing Zhang
Advisor: Jun Yang
Implementing a File System on Top of a DBMS

Zhihui Wang
Advisor: Jun Yang
Multiple View Maintenance with Semantic Caching

Degrees Conferred December 2003

Jeanne Albrecht
Advisor: Amin Vahdat
Developing and Evaluating Novel Network Protocols on Wide-Area Testbeds

Emilia Sorana Buneci
Advisor: Xiaobai Sun
Functional Magnetic Resonance Imaging: Component-wise Models of the BOLD Response in the Human Primary Visual Cortex

Ronald Bryce Inouye
Advisor: Alan Biermann
A Framework for Handling Mixed Initiative and User Modeling in the Missing-Axiom Theory of Dialog Modeling

Priya Mahadevan
Advisor: Amin Vahdat
Mabinet: A Scalable Emulation Infrastructure for Ad Hoc and Wireless Networks

Jagadeeswaran Rajendiran
Advisor: Carla Ellis
SELFLESSS: Self Organizing Low Energy Smart Sensor Systems

Patrick Reynolds
Advisor: Amin Vahdat
Measurement and Causality in Black-Box Distributed Systems

Devised Conferred May 2004

Anagha Gupte
Advisor: Carlo Tomasi
Image Segmentation of Melanocytic Lesions

Charles Killian
Advisor: Amin Vahdat
An Environment for Building and Evaluating Large-Scale Distributed Systems: Challenges, Pitfalls, and Solutions

Ming Qian
Advisor: Kishor Trivedi
All-Terminal Reliability Analysis of the SRP-RING: The Effect of Enhanced Intelligent Protection Switching

Arvind Sastry
Advisor: Carlo Tomasi
Artificial Training Set for the Recognition and Tracking of Hand Gestures

Ferdinand Schöber
Advisor: Gershon Kedem
Increasing Security on Linux Systems Using PDAs

Paul Shealy
Advisor: Carlo Tomasi
Real-Time Hand Location for Gesture Recognition

Sara Sprenkle
Advisor: Jeffrey S. Chase
Using Leases for High Resource Efficiency in Resource Management

Daithi Wang
Advisor: Kishor Trivedi
MTTF Computation for Analytical Models

Adolfo Francisco Rodríguez
Advisor: Amin Vahdat
Building Scalable and Adaptive Network Services

Kenneth Grant Yocum
Advisor: Jeffrey S. Chase
AnyPoint: A Network Communication Model for Internet Services

 Degrees Conferred 2004

Shumin Wu
Advisor: Alan Biermann
Learning Applications to Automated Dialogue System

Anagha Gupte
Advisor: Carlo Tomasi
Image Segmentation of Melanocytic Lesions

Charles Killian
Advisor: Amin Vahdat
An Environment for Building and Evaluating Large-Scale Distributed Systems: Challenges, Pitfalls, and Solutions

Ming Qian
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Advisor: Amin Vahdat
Building Scalable and Adaptive Network Services

Kenneth Grant Yocum
Advisor: Jeffrey S. Chase
AnyPoint: A Network Communication Model for Internet Services

Heng Zeng
Advisor: Alvin Lebeck and Carla Ellis
Explicit Energy Resource Management as a First Class Operating System Resource