Newsletter

College of Physical and Mathematical Sciences

March 2007

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New Minor in CS

The new minor in computer science will provide students from a variety of backgrounds with the basic programming skills needed to compete in an increasingly technological world.

Beginning Fall 2007, BYU students will be able to earn a minor in computer science. The minor is a new addition to the Computer Science family, which already includes bachelors degrees in Computer Science and Computer Science with a Bioinformatics Emphasis as well as masters and doctoral degrees in Computer Science.

The minor will provide students from other majors with a way to certify that they have a basic level of programming competency. As technology becomes increasingly ubiquitous, affecting everything from medical breakthroughs to the appliances in our kitchens, it is important for universities to extend opportunities to gain computational skills to the general student population. This basic training in computer science will give an advantage to students in the workplace from any background and will promote the development of computational solutions in various fields of study.

The minor will give students nine hours (three courses) of beginning programming training. This foundation is complemented by six additional hours (two courses) of electives in computer science that will deepen the student's knowledge in an area of computing most appropriate for their area of interest. For example, there are options for students wishing to emphasize programming skills, computer architecture, or mathematics. In addition, in select instances, students wishing to gain experience in a more specialized area, such as graphics, computer security, or databases, may talk to an advisor about taking upper-level computer science classes to fulfill the two electives. In this way, the new minor gives students a strong background in programming concepts as well as the flexibility to shape the program to fit their needs and goals.

For more information about the new Minor in Computer Science, students can contact Kiersten in the Computer Science Department or check out the following link: http://cs.byu.edu/minor_in_computer_science

Lynne Nielsen Receives Special Recognition

Lynne Nielsen from the Department of Statistics was one of two faculty members at BYU to receive honorary recognition from the University Accessibility Center (UAC) for her work/advocacy for students with disabilities. She was nominated by a former student. Lynne was honored at the Seventh Annual UAC Banquet on February 28, 2007 in the Wilkinson Student Center Ballroom and at a luncheon earlier that day.

February External Grants Awarded to Faculty

Department	Faculty	Project Title
Chemistry	**Merritt Andrus and Edwin Lephart**	Resveratrol Technology
Chemistry	**Daniel Austin**	High-velocity Impact Dissociation and Ionization of Whole Viruses
Chemistry	**David Dearden and Merritt Andrus**	Phase-Transfer Catalyzed Reactions and Applications
Chemistry and Statistics	**Delbert Eatough, Milton Lee, Dennis Tolley**	Hand-Portable Chemical & Biological Agent Director
Chemistry and Statistics	**Paul Farnsworth, Adam Woolley, Milton Lee, Dennis Tolley**	Electromobility Focusing for Separation of Proteins
Chemistry	**Steven Graves**	Joint Center for the Assessment of Biomarkers for Preterm Birth
Chemistry	**Brian Woodfield**	Center for the Production of Nanometer-Sized Metal Alloys, Metal Oxides, and Mixed-metal Oxide Powders
Computer Science	**Mike Goodrich and Tim McLain**	Miniature Air Vehicle Center of Excellence
Geology	**Alan Mayo, John McBride, Stephen Nelson, David Tingey**	Integrated Geophysical and Geological Investigation of Shallow Sub-Surface
Mathematics	**Michael Dorff and Jeffrey Humpherys**	Increasing the Numbers of CS, math, and physics graduates
Physics and Astronomy	**Denise Stephens**	Orbits, Mases, and Densitites of Transneptunian Binaries
Physics and Astronomy	**Denise Stephens**	Identifying L and T Dwarf Binaries in Spitzer
Statistics	**Shane Reese**	CMB Collaborative Research: Models, Tools, and Analysis for Studies of the
Statistics and Chemistry	**David Whiting and Steven Graves**	Preoteomic Identification of Serum Peptides Modified Prior to Preterm Birth

BYU ranked 18th out of 402 teams nationally on the Putnam Exam for 2006.

A total of 3640 students took the exam in the United States and Canada. The median score on this exam every year is 0 out of 120. Twenty-four BYU students took the exam. The following are some of the noteworthy scores:

Score		Ranking (out of 3640)
Yu Yang (Edison)	40 points	140th
Russell Howes	30 points	239th
Nathan Grigg	30 points	239th
Russell Ricks	28 points	282nd
Chul-Woo Lee	18 Points	475th
Wayne Rosengren	11 points	600th
Brian Rushton	10 points	747th
Jonathon Christensen	10 points	747th
Daniel Lemmon	10 points	747th

Important Dates & Events in the College

April 2007

Tuesday, April 3

Stats Seminar, Keith Baggerly, "Cell Line, Microarrays, Drugs and Disease: Predicting Response to Chemotherapy," 3:20-4:10 PM, 1170 TMCB

Wednesday, April 4

Physics Colloquium, Jani Radebaugh, 4 PM C215 ESC

Thursday, April 5

Chemistry Analytical Seminar, Srirama Rao, 4 PM W140 BNSN

Math Colloquium, James A. Yorke, 4 PM 3714 HBLL

Wednesday, April 11

Physics Colloquium, Bradley Carroll, 4 PM C215 ESC

Thursday, April 12

Chemistry Organic Seminar, David Crich, "Chemical Ligation by Sigmatropic Rearrangement and Other Methods," 4 PM W140 BNSN

CS Demo Day. Students presenting research done throughout the semester, 11 AM 1170 TMCB

Geology Seminar, Roger Palmer, "Geology and Operations of the Bogoso Gold Mine in Ghana, West Africa" 11 AM C295 ESC

Monday, April 16

Chemistry Analytical/Physical Seminar, Liwei Chen, "Solution Redox Chemistry and Dielectric Properties of Carbon Nanotubes" 4 PM W140 BNSN

Tuesday, April 17

Chemistry Analytical/Physical Seminar, Wolfgang Fritzsche, "DNA-conjugated Metal Nanoparticle for Bioanalytics, Nanophotonics and Nanoelectronics" 4 PM W140 BNSN

Stats End of the year Seminar, 3:20-4:10 PM 1170 TMCB

Wednesday, April 18-

Thursday, April 19

Reading Days

Friday, April 20-
Wednesday, April 25

Finals

Thursday, April 26

University Commencement

Friday, April 27

College Covocation, 8 AM, WSC Ballroom

CS Graduation Reception, 10 AM

Annual Spring Research Conference

The annual Spring Research Conference for the College of Physical and Mathematical Sciences was held on Saturday, March, 17th 2007 It was a great success and there were 324 students that presented throughout the day. The students put a lot of effort into their presentations. Judges and Chairs were pleased with the effort and time put into the preparation of these presentations.

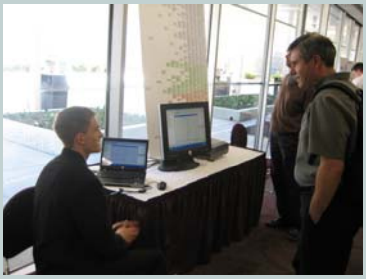
A brunch was provided for all involved, in between sessions. During this short break, pictures were taken of the Frontiers Mentorship Recipients. After the 2nd session, the judges turned in their nominations to the chair and the winners were selected.

Family History Technology Conference

By **Kiersten Nielson**

On March 15, 2007, the Computer Science Department hosted the Seventh Annual Family History Technology Conference at BYU. Held on campus in the Harmon Building, the Conference brought together more than 100 family history enthusiasts, computer scientists, and engineers from around the world to discuss family history needs and present emerging technologies aimed at advancing the work.

The Conference began with a keynote address from Richard and Loretta Nixon, two family history aficionados whose foresight and dedication to the work have helped unearth countless records and link together generations. President and Sister Nixon spoke on their love for the work and their vision for the future. In particular, Sister Nixon identified several ways in which technology could aid her work, including open source software, indexing programs, and "anything which will help to eliminate duplication of temple work." Their address ended with the challenge that those involved in engineering new family history technologies will receive insight from the Lord and will be prepared to act on that insight when it comes.



A series of paper presentations followed the opening addresses. The presentations covered a variety of topics. Conference attendees were introduced to the "Millennium CD," a revolutionary new device in data storage engineered by Dr. Barry M. Lunt and his students in BYU's Information Technology Department. They were given a glimpse into the future of tracking and managing family history data by students and faculty from Neumont University, who presented a paper on their "Collaborative Research Assistant" program. And they watched as history was brought to life through record extraction and image processing technologies, such as a machine learning approach to record linkage, presented by BYU students Steven Ivie and Haven Gatrell, and the Rotsu algorithm, a technology that makes it possible for historians to read centuries-old documents that would otherwise be indecipherable, presented by BYU masters student Oliver Nina. Woven between the paper presentations were demos of new technologies by BYU computer science students and companies specializing in family history technology. Representative from the LDS Family History Department and Family History Library also reported on the progress being made by the Church. Exciting developments included new website applications and the announcement that the Church has plans to digitize 10,000 books from the Family History Library by Spring 2008.

At the 100th anniversary of the Utah Genealogical Society, President Howard W. Hunter said, "The Lord has guided the development of information technology and accelerated its role in work for the dead, and will continue to do so. However, we stand only on the threshold of what we can do with these tools. I feel that our most enthusiastic projections can capture only a tiny glimpse of how these tools can help us - and of the eternal consequences of these efforts." This is the vision which drives the Family History Technology Conference, as year after year it brings together historians and engineers, experts and novices, with the goal of reaching back in time to link past generations with the future.

College Publications

Chemistry and Biochemistry

L. Pei, G. Jiang, V. Smentkowski, M.C. Asplund, and M.R. Linford, "Laser Activation-Modification of Semiconductor Surfaces (LAMSS) of 1-Alkenes on Silicon: A ToF-SIMS, Chemometrics, and AFM Analysis," *Appl. Surface Sci.*, **253**(12), 5375-5386 (2007).

D.J. Henderson, "Comment on the Differential Equation of Smagala and Fawcett," *J. Electroanal. Chem.* **602**, 142-144 (2007).

B. Ma, J.L. Parkinson and S.L. Castle, "Novel *Cinchona* Alkaloid Derived Ammonium Salts as Catalysts for the Asymmetric Synthesis of β-Hydroxy α-Amino acids via Aldol Reactions," *Tetrahedron Lett.* **48**, 2083-2086 (2007).

Computer Science

N D Cooprider and R P Burton, "Extension of Star Coordinates into three dimensions," *Visualization and Data Analysis* 64950Q-1 - 64950Q-10 2007.

M. A. Goodrich, T. W. McLain, J. D. Anderson, J. Sun, and J. W. Crandall, "Managing Autonomy in Robot Teams: Observations from Four Experiments," Proceedings of ACM SIGCHI/SIGART IEEE International Conference on Human-Robt Interaction. March 9-11, 2007, Washington, DC. \

S, Ivie, G. Henry, H. Gatrell, and C. Giraud-Carrier, "A Metric-Based Machine Learning Approach to Genealogical Record Linkage," *Proceedings of the 7th Annual Workshop on Technology for Family History and Genealogical Research*, (2007).

E K Henderson, and T R Martinez, "Constructing Low-Order Discriminant Neural Networks Using Statistical Feature Selection," *Journal of Intelligent Systems*, vol. 16, no. 1, pp. 27-56, 2007.

Mathematics

S. Glasgow, M. Meilstrup (Ph.D. Student), J. Peatross and M. Ware, "Real-time recoverable and irrecoverable energy in dispersive-dissipative dielectrics," *Physical Review E* 75, 016616 1-12, 2007.

S. P. Humphries, "An action of subgroups of mapping class groups on polynomial algebras," *Topology and Its Applications*, 154, 1053-1083.

Mathematics Education

J.G. Walter & H. Gerson, "Teachers' personal agency: Making sense of slope through additive structures," *Educational Studies in Mathematics*, *65* (2), 203-233 (2007).