

Spotlight on ECST:

Jeremy Dreese

Aaron Seymour 2005

Of all the important components in a computer science education, one of the most significant is access to an advanced, reliable computer system. One need only log into one of the engineering UNIX servers, at almost any time of the day, to see the many dozens of students and faculty logged in. However, this resource does not come without a fair amount of careful maintenance by members of ECST (Engineering Computing Support Team).

One such member of ECST is Jeremy Dreese, Engineering Computer Systems Integrator. Jeremy, along with Mike Harvey, is responsible for all of the UNIX and Linux systems in the College of Engineering. He is a graduate of Bucknell, but computer science was not his first choice going into college. Jeremy who is a native of Mifflinburg originally started college planning to study chemistry. In school, however, he discovered that he had a much greater interest in computers and eventually transferred to Bucknell to study computer science. After graduating in 1998, he was offered a temporary position at Bucknell, but he decided to take a job at Lockheed Martin doing UNIX system administration. Later when a more permanent position became available, he returned to Bucknell.

Jeremy's duties in ECST span a wide vari-

ety of software and systems. In addition to updating and supporting UNIX and Linux on workstations, he maintains all of the engineering UNIX servers, oversees the engineering website <http://www.eg.bucknell.edu/>, handles UNIX user account management, and still finds time to locate students illicitly storing files in /var/mail. And, although he spends much of his time on basic system maintenance, he is also working on several long term projects. This past summer he changed the configuration of the current UNIX file server so that users of Microsoft Windows could easily access their UNIX files. He has also been working to migrate all of the current Linux systems to Red Hat Enterprise Linux. In the future he hopes to introduce a notification system to let people know when they have exceeded their file quota, and he is planning to replace the current NIS+ UNIX authentication with something like LDAP or Kerberos.

When questioned about some of his long term plans, Jeremy mentioned an interest in learning a another scripting language such as Python. He is also trying to encourage all users to make use of secure remote utilities such as ssh, scp, and sftp instead of telnet, rcp, and ftp. And, as a means of increasing security, he plans to centralize the storing of server logs onto one server.

Anyone who has used the UNIX or Linux workstations should consider paying Jeremy a visit. He is very open to suggestions for improving the system, and he is very willing to help out by installing that obscure library or utility you might need to complete a computer science project. Also, for those who are fans of Linux, Jeremy is very interested to discuss current developments in Linux. Jeremy's office is located on the second floor of Dana on the right immediately before the passageway to the Computer Center.

The Bucknell Connection
 Computer Science Department
 Bucknell University
 Lewisburg, PA 17837

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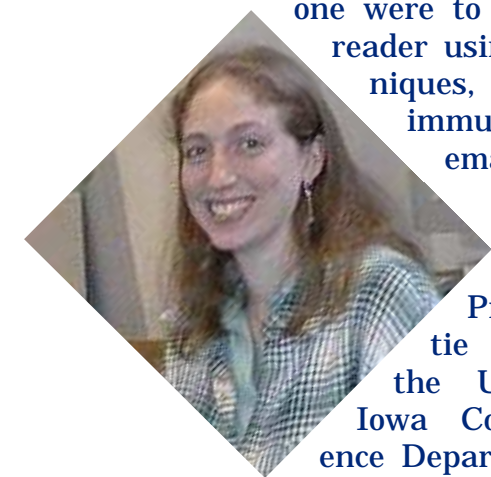


Professor Wittie

Shawn Walters and Eric Reed 2006

This year, the Computer Science department once again has explored Dartmouth College and found its students a new professor, Lea Wittie. Professor Wittie comes to us with a strong background in language support for operating system abstractions. She received her undergraduate degree in Computer Science in 1998 at Grinnell College in Iowa, and went on to obtain her PhD in Computer Science in June of 2004 at Dartmouth College in New Hampshire.

Professor Wittie's background in language support means that she creates programming language constructs which allow a programmer to make guarantees about various operating system abstractions. An example of such an abstraction is memory. Using various abstractions, such as memory and locking, she provided the tools for a network interface card driver that is guaranteed to be free of memory errors like reading or writing memory that your program does not own. If some-



one were to write a mail reader using such techniques, it would be immune to most email viruses!

During her studies at Grinnell,

Professor Wittie interned at the University of Iowa Computer Science Department during a Research Experience for

Undergraduates (REU) program. There, she implemented a stereoscopic display on the HANK driving simulator which runs on an SGI. HANK is based on IRIS Performer 2.0 and written in C++. Her stereoscopic display allows the simulator to be run in 3D mode with options of multiple screen angles (rear-view mirror, etc....).

While studying for her graduate degree, Professor Wittie interned at Symbol Technology in New York. One of her most interesting projects there was designing a web graphical user interface (GUI) that allows administrators additional control over a wireless access point using HTML, JavaScript, and a commercial web GUI builder. Also, she extended a web interface module that connects the wireless point to the web-based controls using C. A final aspect of this internship provided her with the opportunity to analyze protocols for networking quality of service, and she implemented revised protocols using C. Professor Wittie's time at Symbol gave her a general feel for the motivations behind

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Spring 2005 Computer Science Electives

Computer Graphics, CS367

Professor Wenner

Prerequisites: CS204, Jr/Sr Standing

Tabitha Peck 2005

Computer graphics algorithms are the foundation for the application programs that produce special effects for movies, business presentations, web content, etc. These algorithms are the primary subject of study in this computer graphics course. It is the task of these algorithms, using complex three-dimensional computer models, to decide what color to draw at each of the one million plus pixels on the display. Algorithms for scan conversion, visible line determination, 3D viewing projection, lighting calculations, etc. are explored. The underlying mathematics is examined to see why matrix calculations are essential. Hardware characteristics, down to the chip level are discussed. A weekly lab introduces 2D and 3D modeling using OpenGL. A retrospective of 50 years of CG images is presented.

Software Engineering, CS379

Professor Zaccone

Prerequisites: Sr Standing

Matthew Berntsen 2005

The Software Engineering elective will focus on the art of designing and writing good software. Topics include extreme programming, types of inheritance, polymorphism, software design, unit testing, debugging techniques, design patterns, refactoring, and metaclasses. The course will involve a semester-long project.

The language used will be Squeak which is a direct descendant of Smalltalk-80. Smalltalk was one of the first object-oriented programming languages. Squeak was developed by the same people who created Smalltalk, and it reflects their vision of where object-oriented programming should be going.

Databases, CS305

Professor Miranda

Prerequisites: CS206, Jr/Sr Standing

Tanya Sichko 2005

Introduction to Database will give students a foundation for database design through theory and practice, with emphasis on the relational model. Students will discuss multiple database models and will become proficient in their design and implementation. The course will examine Database Management Systems (DBMS) in some detail. Languages/protocols/systems used will include Oracle, SQL, Datalog, Java, and JDBC (Java's DBMS interface). Students will leave the course with a firm understanding of the theory and many models of database design. The final course project will allow students to design and implement their own Oracle database to tie together everything learned in the course.

Object Oriented Languages, CS330

Professor Mead

Prerequisites: CS208

Tabitha Peck 2005

Professor Mead will be teaching object oriented programming language (OOPL) which discusses the characteristics of OOPLs and what it is that makes a language object oriented. The class will build on information gained in CS208 but will focus on the languages rather than the programming. There will be group projects in Java, smalltalk, and (probably) Self with each group choosing a different object oriented language and giving a presentation on its structure and features. In addition to the required text students will also be expected to read and discuss a journal paper. All the course activities will be focused on discovering and understanding the basic characteristics of object oriented languages.

Computer Networks, CS363

Professor Perrone

Prerequisites: CS315

Hoang Le 2007

During the course, students will have a chance to look at different layers in network architecture. The objective is to understand the design decision for each layer and to propose improvement on the architecture. Through lectures and labs, the course will give students practical experience on system programming in C/C++, protocol design, and many other network technologies. The course will be using Computer Networks, 4th edition by Andrew S. Tanenbaum, a really good text book for building a foundation of computer networking from the bottom up. Topics covered in the course will also include wireless network and network security.

Professor Wittie (cont.)

actual industry operating system writing. While there was a push to get the product out the door, there was also enough lag time to produce a decent product if the development team is strong. This means that her research could be applied to real world operating systems!

Professor Wittie has further expanded the possibilities for future Bucknell students by bringing with her a strong background in compiler optimization. This spring, she will be offering a course in Compiler Optimization, which

Compiler Optimization, CS379

Professor Wittie

Prerequisites: CS208

Shawn Walters and Eric Reed 2006

For those wondering what happens when they methodically type g++ on the Suns and why it takes so long to run, there is a course being offered in the spring of 2005 that would be a perfect fit! Professor Wittie will be offering a half-credit course in Compiler Optimization that will focus on both coding and compiler techniques such as loop unrolling to produce faster runtime. You will also learn about some code analysis techniques (known as profiling) to test how well a given optimization is working. The course will entail a semester long project with the goal of adding optimizations to an existing compiler. Interested students should keep in mind that this course will be limited to 6 students.

will be highly selective as the class size is only 6 students, so sign up early! Also, one of her goals is to have students working with her on research projects as early as next fall, as she highly values the opportunity to share her research with eager students.

We feel that the Computer Science department has found another excellent product of Dartmouth College, as Professor Wittie seems to be a perfect fit for the Bucknell community, and we wish her the best of luck in her new career!

The logo for 'Connection' is displayed in a stylized, orange, blocky font. The letter 'C' is significantly larger and more prominent than the other letters. The entire logo is enclosed within a blue rectangular border.