

# COMPUTER SCIENCE COLLOQUIUM TWENTY FIFTH SERIES – FALL 2006

Thursdays at 12:00

Darwin Hall, Room 102

## AUG 31 PROGRAMMING FOR HIGH PERFORMANCE COMPUTING

**Carol Thompson Eid, Microsoft Research, Mountain View.** The computing landscape is at a major crossroads. Moore's law is running out of steam for uniprocessor systems, multi-core processors are on the desktop, and clusters are becoming both more affordable and easier to use. Once limited to only very high-end systems, High Performance Computing is becoming mainstream. This talk will describe the support that's available in Visual Studio for developing applications that exploit these parallel systems using industry standard techniques. In conclusion, future directions for parallel application development will be described.

## SEP 7 EXPERIMENTAL MATHEMATICS: HIGH-PERFORMANCE COMPUTING MEETS PURE MATHEMATICS

**David Bailey, Lawrence Berkeley Labs.** Although computer technology had its origin in the field of pure mathematics, until recently it was thought that "real mathematicians don't compute." This has all changed in the past ten years or so, as numerous mathematicians are now using sophisticated computations in their research. The speaker will describe some results where high-precision computations, often performed on highly parallel computer systems, have produced striking new results of mathematics. One of the best known of these is a new formula for pi, which permits binary digits of pi to be computed beginning at an arbitrary starting position.

## SEP 14 QUAIL RIDGE WIRELESS MESH NETWORK

**Prasant Mohapatra, University of California, Davis.** Multi-hop Wireless Mesh Networks are becoming a popular alternative to extending the typical Wireless Local Area Networks we use today. Mesh networks have the advantage of low-cost, incremental and ease of deployment, and reconfigurability. In this talk we will discuss about our ongoing effort on a wide area deployment of wireless mesh network at the Quail Ridge Wildlife Natural Reserve. Quail Ridge boasts 2,000 acres of untouched wilderness on a peninsula of Lake Berryessa, California. In deploying a wireless mesh network at Quail Ridge, we seek to assist ecological research in the area for local and remote monitoring, as well as provide a platform for wireless mesh networks research in the future. We will also discuss our research on multi-channel, multi-radio mesh networks, heterogeneous meshes, and all the experiences learnt from the real-world deployment of the Quail Ridge Wireless Mesh Network.

## SEP 21 AN INTRODUCTION TO BIOINFORMATICS

**B. Ravikumar, Computer Science Department, SSU.** Computational techniques and algorithms have made major advances in molecular biology. In turn, biology offers not only challenging computational problems but also models that can become the basis for next generation computers. In this talk, we will present some basic computational problems in this field and discuss various approaches that computer scientists have developed to solve them.

## SEP 28 ICE: INFORMATION, COMMUNICATION, AND ENTERTAINMENT

**Jeremy Lowrey, Calix Networks, Petaluma.** ICE is the next step beyond triple play in telecom. Learn about the transformations of ATM to IP networks that will deliver all services to subscribers. Plus how to prepare for and what to expect working inside the telecom industry.

## OCT 5 REVERSE ENGINEERING FOR VULNERABILITY RESEARCH

**Adam Gowdiak, Sun Microsystems Laboratories, Menlo Park.** Reverse engineering techniques are the "secret weapon" in every security researchers' bag. In many cases, application of these techniques is the only way to a successful (ending with a discovery of a high impact bug) software security audit. Regardless of the legal threats which reverse engineering people might face, this area has been gaining on popularity in the recent years. This talk will present latest trends in the reverse engineering area with a focus on the techniques used by security researchers to analyze binaries for security defects.

## OCT 12 SCORING ALIGNMENT GAPS IN THE TWILIGHT ZONE

**Barbara Chapman, Sonoma State University.** Scoring systems for protein sequence alignment, the main tool for annotating new genes, perform poorly in the most informative comparisons. In this 'twilight zone' of amino acid identity, existing scoring methods miss true relationships and cannot consistently reject chance similarities. This talk covers a proposed structure-sensing scoring method that performs well on tests of execution time, sensitivity, and alignment quality.

## OCT 19 IS YOUR DATA REALLY BACKED UP?

**Robert Plantz, Computer Science Department, SSU.** You accidentally delete a file. Or you try to boot your computer and discover that the disk has failed. When was the last time you backed up? Did your backup software save everything? The time the file was last modified? Owner/group permissions? Your personal settings? Is the backup media still good? There is much more to backing up than simply copying files. This talk will address backing up issues in the context of Linux and Mac OS X on the desktop, but the concepts apply to any environment.

## OCT 26 THE HP LABS VIRUS SAFE COMPUTING INITIATIVE

**Alan Karp, Hewlett-Packard Laboratories, Palo Alto.** HP Labs encourages activities considered to be out of the mainstream. Our group takes a view of security that is quite different from that of the official HP and HP Labs security teams. This talk will discuss our approach and our primary work on a virus safe computing environment for Windows XP. Surprisingly, we don't require people to turn off their computers to protect themselves. We simply let the virus run in an environment where it can't do very much harm. A demo will be given that shows you don't have to turn off macros or stop opening email attachments to be virus safe.

## NOV 2 COMPUTER GAME DEVELOPMENT

**Karen Peterson, Telltale Games, San Rafael.** An overview of the game development process and terminology, with an emphasis on programming practices beyond the fundamental concepts learned through coursework, and demonstration of the development of a shipped game.

## NOV 9 AUTOMATA EXTRACTION AND VERIFICATION FOR HYBRID SYSTEMS

**Aaron Díaz, Santa Clara University.** A hybrid system is a continuous dynamic system interacting with a finite control automata. One would like to construct a digital controller to drive the continuous system from its initial state, to some goal state, in an optimal fashion. In addition, one often wishes to verify properties of the controller, for example that any trace of execution of the automata will cause the continuous system to only enter states deemed safe. In this talk we will overview these two topics of control automata extraction and verification.

## NOV 16 ELEMENTS OF GAME DESIGN

**Jason Shankel, Maxis/Electronic Arts, Walnut Creek.** In recent years, the emerging discipline of game design has become as much a craft as it is an art. In this talk, I will present the key elements of a computer game design and discuss how these elements are combined to make fun, compelling computer games.

## NOV 23 THANKSGIVING HOLIDAY – NO LECTURE

## NOV 30 STUDENT RESEARCH PRESENTATIONS

**Student presentations on individual projects and research.** Contact Dr. Stauffer (lynn.stauffer@sonoma.edu) if you are interested in presenting.

## DEC 7 END OF SEMESTER PIZZA PARTY AND AWARDS PRESENTATION



Computer Science Dept., Sonoma State University, Rohnert Park, CA 94928  
(707) 664-2667

<http://www.cs.sonoma.edu/>

Parking is usually available in Lots "E" and "F" and costs \$2.50.  
Sponsored by the generous donations of SSU Computer Science Alumni