

FEB.16 Nina Amenta, University of California, Davis

COMPUTING AND USING THE VORONOI DIAGRAM

The Voronoi diagram of a set of points divides space into regions, each region consisting of the part of space closer to a particular input point p than to any other input point. It comes up in a wide variety of computational problems. In computer graphics, it is used to construct a polygonal surface given a set of point samples from the surface with no additional connectivity information - kind of a 3D connect-the-dots. This talk is about how the Voronoi diagram is computed, and how it can be used to solve this problem.

FEB.23 Larry Lesser, PSSC Labs, Lake Forest, California

SUPERCOMPUTING: HISTORICAL PERSPECTIVE, PRESENT TRENDS AND FUTURE PROMISES

PSSC Labs is a leading provider of high performance computing equipment to government, university and corporate organizations. Founder and CTO, Larry Lesser, has been involved with supercomputing technologies over the past 35 years. Mr. Lesser will overview the history of supercomputers, present developments including multi-core processors and high speed interconnects as well as provide some insight into the future of supercomputing including environmental and commodity limitations.

MAR.02 Carol Thompson Eidt, Microsoft Research, Redmond, Washington

PROGRAMMING LANGUAGE EVOLUTION: PUSHING THE LIMITS OF TECHNOLOGY

Programming models, and their syntactical representation, have been forced over the years to compromise based on limits in supporting technologies. These technologies include the speed and capacity of the underlying processors, compiler techniques, software engineering methodologies and user interface design. Programming languages have continually evolved to maintain a balance between programmer productivity, compiler complexity, and runtime efficiency. This talk will trace the evolution of programming languages, along with the technologies that both constrained and enabled that evolution, with an emphasis on the interplay between processor architecture and compiler design.

MAR.09 George Hsu, Sensor Platforms, Santa Rosa, California

THE NITTY-GRITTY ON THE FUTURE OF SENSOR TECHNOLOGIES

An overview will be presented on sensor fundamentals--how they work, how they're made, what sorts of applications will use them, how the paradigms are shifting and Sensor Platforms' role in helping enable the next revolution in bringing them to a broader market. Electronic sensors have been around for decades, but with the convergence and proliferation of low cost and pervasive computing, networking, RF and Internet technologies in conjunction with the staggering growth of enormous numbers of mobile communication and information platforms (i.e., think cell phones and MP3 Players) incredible opportunities abound for the right approach. Come see how one company views the future.

MAR.16 Tina Amper, Blue Sky Solutions / ADIC, San Francisco, California

WHAT DISASTER RECOVERY PLAN?

What if power went down or your facilities were flooded? How well can your organization handle and survive a disaster or business interruption? Best practices for business continuity and disaster recovery management are discussed in this talk.

MAR.23 John Mamer, UCLA Anderson School of Management

LOTTERIES AS A MECHANISM FOR CONTRACTING VIA THE INTERNET

The Internet holds the promise of bringing vast computing power, currently locked up in idle computers, to bear on problems of commercial interest. Key to unleashing this computing power is the ability to contract for computing resources via the Internet. The anonymous and transient environment of the Internet poses a challenge to the design of an efficient payments system. The use of lotteries offers, instead of a small payment for each unit of computation, a small chance at a larger prize. What can be surmised about the economic efficiency of such a system as the number of participants increases without limit (and hence each individual's contribution becomes small)?

MAR.30 Tom Slezak, Lawrence Livermore National Laboratory

BIOINFORMATICS SUPPORT OF PATHOGEN DIAGNOSTICS AND FORENSICS

A bioinformatics team at Lawrence Livermore National Laboratory (LLNL) has been computationally designing pathogen DNA signatures since the summer of 2000. These signatures were used for biosecurity at the 2002 Winter Olympics, as well as for national security purposes since October 2001. This talk will discuss the LLNL team's involvement with these efforts and various outbreaks (SARS, monkeypox, Avian Influenza, Exotic Newcastle Disease, etc.)

APR.06 V. Scott Gordon, California State University, Sacramento

THE SELF-SPLITTING NEURAL NETWORK

A Neural Network is a popular artificial intelligence technique in which an array of simulated neurons are interconnected to form a very simplified model of a tiny brain. Knowledge is stored in the interconnections, and is typically acquired through training. In practice, this is often limited to relatively small problems. The self-splitting neural network attempts to tackle larger problems by dividing the input domain into small chunks, and assigning a separate neural network to each chunk. Using a variety of splitting methods, large problems not typically solvable with standard neural networks have been learned quickly and with excellent generalization.

APR.13 Kishan Shenoi, Symmetricom, San Jose, California

SYNC AND TIMING ISSUES OF CARRYING TDM TRAFFIC OVER PACKET NETWORKS

Packet networks are very efficient in delivering information ("bits") between two end points. Delivery of TDM signals requires, in addition to bits, the replication of timing ("bit-time"). The talk introduces the notion of transporting bit-time and explains the four primary methods being considered in the various Standards Bodies. The advantages and disadvantages of these methods are explained.

APR.20 SPRING BREAK – No colloquium

APR.27 Jason Shankel, Maxis/Electronic Arts, Walnut Creek, California

PROTOTYPING IN GAME DEVELOPMENT

Prototyping is a powerful method for isolating and testing particular aspects of complex software designs. In this talk, I will discuss the use of prototyping in the development of computer games.

MAY 04 Bill Wilson, Security Consulting, Cupertino, California

APPLICATION OF GENETIC PROGRAMMING TO FRAUD DETECTION AND SECURITY

Genetic Programming is a machine learning method that has been successfully applied to problems as diverse as designing radio antennas, jet engines, and analysis of the human genome. It can be used to find patterns that characterize specific types of data and transactions. This talk will give a brief introduction to genetic programming and explore its potential applications to problems in network security and financial fraud. In particular the talk will consider what specific types of problems genetic programming will most likely be able to effectively address. It will also present remaining challenges in the practical application of genetic programming to these problems.

MAY 11 Student Presentations

SHORT PRESENTATIONS OF RESEARCH CARRIED OUT BY SONOMA STATE STUDENTS