COMPUTER SCIENCE COLLOQUIUM

FORTIETH SERIES / SPRING 2014

THURSDAYS 12:00 NOON / SALAZAR 2016

JAN.30	Henry Neugass, Embedded Systems Consultant (Emeritus), Palo Alto, CA **FORTH, A MINIMALISTIC DEVELOPMENT ENVIRONMENT OF LONG-AGO OFFERS LESSONS FOR TODAY** The Forth language/system, which was perfectly adapted to the very constrained environments of the 1970s - 80s, is an example of an elegant and generally transparent implementation. And Forth's inherent extensibility gave users unprecedented control of procedural abstraction. For productivity and basic joy-of-coding, you should evaluate each project --and each job offer-- accordingly. Today, we're accustomed to essentially infinite --and cheap-- computing resources. Are the values of elegance and transparency still relevant? Abstraction is a fundamental of computing, but there's an often-hidden overhead cost due to increasing abstraction.
FEB.06	Ewa Deelman, USC Information Sciences Institute, Marina Del Rey, CA **SCIENTIFIC WORKFLOWS ON THE CLOUD: CHALLENGES AND SOLUTIONS** This talk will focus on the issues related to complex applications, such as workflows, executing on cloud infrastructures. It will provide examples of workflow applications and their cloud computational needs. The talk will discuss challenges faced by scientific workflow management systems when running on the cloud. It will also discuss issues of resource provisioning on the cloud and describe some of the available tools.
FEB.13	Adi Kamdar, Electronic Frontier Foundation, San Francisco, CA **PATENT TROLLS, PATENT REFORM, AND THE REAL PATENT PROBLEM** Over the last few years, patents have been a hot topic: tech giants are engaged in endless lawsuits, trolls run amok, and reform is in the air. Every branch of government, as well as businesses big and small, seems to have a dog in this fight. What's really going on? By focusing on trolls and lawsuits, are we losing sight of the bigger question of the patentability of software? And is the reform we're seeing really the reform we ultimately want?
FEB.20	Bryan Dixon, CSU Chico, CA **POWER-BASED MALICIOUS CODE DETECTION ON SMARTPHONES** In recent years there has been a growing number of viruses, rootkits, and malware designed to gain access to system resources and information stored on smartphones. Most current approaches for detecting this malicious code have detrimental impacts on the user in terms of reduced functionality, slower network speeds, or loss of battery life. This talk will present a number of approaches that offer successful detection for potential malicious code by focusing on anomalous power use as a method for detecting the presence of malicious code. This work also introduces ways to fine-tune the process by establishing a normal profile of power usage for each user, which increases the rate of malware detection.
FEB.27	Bob Hearn, H3 Labs, Palo Alto, CA **GAMES, PUZZLES, AND COMPUTATION** One can frame a game or a puzzle as a decision problem: from this configuration, does the puzzle have a solution? Can Black win the game? The computational complexity of the decision problem can then be investigated. Reviewing the properties of the complexity classes (NP-complete, PSPACE-complete, etc.), it's possible to briefly survey several hardness results, including sliding-block puzzles, sliding-coin puzzles, TipOver, Rush Hour, Sokoban, hinged polygon dissections, plank puzzles, the Dyson telescope game, Amazons, and Konane. These results are all applications of a larger framework of computation in terms of generalized games (as opposed to Turing machines), called Constraint Logic. In this framework, cellular automata are zero-player games, puzzles are one-player games, and ordinary games are two-player games. Surprisingly, some team games turn out to be undecidable, even though they are played with finite physical resources.
MAR.06	**PIZZA AFTER TALK IN DARWIN 28** Jason Shankel, Stupid Fun Club, San Francisco, CA **THE QUANTIFIED SELF** As computer and communication technologies become increasingly personal, consumers will be tracking their daily lives to a greater degree than any time in history. I will discuss the technological, social and cultural opportunities and pitfalls of the Quantified Self movement.
MAR.13	Kate Lockwood, CSU Monterey Bay, Seaside, CA **INNOVATION IN THE COMPUTER SCIENCE CLASSROOM** Computer science is a very innovative and creative field, but is often taught using very traditional methods. In this talk, I'll discuss some recent efforts to bring innovation into the classroom to engage students, to improve student performance and to increase retention of students in the major. At CSUMB I have taught introductory programming using the inverted classroom method where students are assigned passive activities, like lectures and readings, as homework and classroom time is dedicated to active, hands-on problem solving. I will talk about some preliminary results from the inverted classroom as well as talk about the potential for future research. I will also cover some other innovative methods for teaching computer science, including peer-led instruction, problem based learning and cohort based programs.
MAR.20	**SPRING RECESS (No Colloquium)**
MAR.27	Eric Allman, Swarm Lab, UC Berkeley, CA **TIME-SENSITIVE NETWORKING: AUDIO VIDEO BRIDGING** Conventional A/V presentation over a network works through over-provisioning, notably requiring more bandwidth than actually needed to avoid jitter due to lost packets and a lot of buffering. Some applications however require real time response (with latency of no more than 2 mSec in some cases). Achieving this requires reserving bandwidth, traffic shaping, and clock synchronization. This talk will discuss available Audio Video Bridging technology and give some thoughts on adapting it for other purposes.
APR.03	Melanie Martin, CSU Stanislaus, Turlock, CA **LATENT SEMANTIC ANALYSIS: FROM INFORMATION RETRIEVAL TO TEAM COGNITION AND PERFORMANCE** In this talk I will introduce some basic issues in Information Retrieval and show how Latent Semantic Analysis (LSA) is a vast improvement over the Vector Space Model. LSA has been successfully used in a wide variety of natural language processing tasks. I will focus on applications of LSA to analyze team cognition and performance, based on team communication content. I will discuss the implications of this research for team training and assessment.
APR.10	Fei-Fei Li, Stanford University, CA **COMPUTER VISION: A QUEST FOR VISUAL INTELLIGENCE** More than half of the human brain is involved in visual processing. While it took mother nature billions of years to evolve and deliver us a remarkable human visual system, computer vision is one of the youngest disciplines of AI, born with the goal of achieving one of the loftiest dreams of AI. The central problem of computer vision is to turn millions of pixels of a single image into interpretable and actionable concepts so that computers can understand pictures just as well as humans do, from objects, to scenes, activities, events and beyond. Such technology will have a fundamental impact in almost every aspect of our daily life and the society as a whole, ranging from e-commerce, image search and indexing, assistive technology, autonomous driving, digital health and medicine, surveillance, national security, robotics and beyond. In this talk, I will give an overview of what computer vision technology is about and its brief history. I will then discuss some of the recent work from my lab towards large scale object recognition. I will particularly emphasize on what we call the "three pillars" of AI in our quest for visual intelligence: data, learning and knowledge. Each of them is critical towards the final solution, yet dependent on the other. This talk draws upon a number of projects ongoing at the Stanford Vision Lab.
APR.17	V. Scott Gordon and Michael Vollmer, CSU Sacramento, CA **A NEW VERSION OF MINIMAX THAT DOESN'T ASSUME BEST MOVE** At the core of every computer strategy game (such as in a chess program) is the minimax algorithm. Minimax works by assuming that both players always choose the best move. But that isn't how humans decide their moves - instead, humans try to set traps that lure the opponent into making a wrong move. We developed a "Trappy Minimax" algorithm to emulate this more human-like style, using a clever trick involving iterative deepening search. We then took a well-known existing chess program (ChessBrain), substituted trappy minimax, and tested both versions on ICC (Internet Chess Club). The "trappy" version achieved a significantly higher rating, even though it sometimes plays moves that, according to normal minimax, are flawed. The results call into question the most basic tenet of the minimax algorithm, and offer a powerful alternative.
APR.24	**PIZZA DURING TALK IN SAL 2016** **STUDENT PRESENTATIONS** / SHORT PRESENTATIONS OF RESEARCH CARRIED OUT BY SONOMA STATE COMPUTER SCIENCE STUDENTS
MAY.01	**PIZZA DURING TALK IN SAL 2016** **END OF SEMESTER CELEBRATION** / AWARDS PRESENTED TO SONOMA STATE COMPUTER SCIENCE MAJORS

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