

Computer Science Colloquium

Nineteenth Series - Fall 2003

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Thursdays noon to 12:50 in Darwin 108 on the SSU Campus
Open to the Public

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| <p>September 11</p> | <p>BASIC VIDEO GAME DEVELOPMENT</p> <p>William Kendrick, President inux Users' Group of Davis (www.lugod.org)</p> <p>First time game programmers should be careful not to delve directly into development of massively multiplayer online role playing games, but should first start with the basics: snake game, 2D mazes, and simple space shooters. Bill Kendrick, who never really got BEYOND such simple but addictive games, will discuss the very basics of game design and development. Using the popular Open Source 'Simple DirectMedia Layer' library (www.libSDL.org), he'll construct a simple interactive action game in the C programming language. SDL's advantages include cost, simplicity, wide usage and support, numerous add-on libraries, and the ability to target many popular Operating Systems, including Linux, Windows, Mac OS and OS X, BeOS, classic Amiga, and even the Sega Dreamcast video game console.</p> |
| <p>September 18</p> | <p>DISCRIMINATION OF SINGLE BASE PAIR DIFFERENCES AMONG INDIVIDUAL DNA MOLECULES USING A NANOPORE</p> <p>Veronica DeGuzman Nanopore Laboratory, University of California, Santa Cruz</p> <p>The protein toxin alpha-hemolysin form nanometer scale channels across lipid membranes. Our lab uses a single channel in an artificial lipid bilayer in a patch clamp device to capture and examine individual DNA molecules. This nanopore detector used with a support vector machine (SVM) can analyze DNA hairpin molecules on the millisecond time scale. We distinguish duplex stem length, base pair mismatches, loop length, and single base pair differences. The residual current fluxes also reveal structural molecular dynamics elements. DNA end-fraying (terminal base pair dissociation) can be observed as near full blockades, or spikes, in current. This technique can be used to investigate other biological processes</p> |

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| | <p>dependent on DNA end-fraying, such as the processing of HIV DNA by HIV integrase.</p> |
| September 25 | <p>MAYA PROGRAMMING: MAKING TOOLS TO MAKE MAGIC</p> <p>Chad Morgan LucasArts, San Rafael</p> <p>Maya has been used to make combatants in Gladius battle, Spiderman swing through New York City, and gave life (and fur) to Stuart Little. But even the most talented artist is limited by the capabilities of the tools at hand. Luckily, Maya is greatly extendable through the MEL scripting language and the API. Come see how easy it is to make Maya do whatever you want it to do.</p> |
| October 2 | <p>OBJECT-ORIENTED VERSUS PROCEDURAL VERSUS DATA-CENTRIC: A SMALL CASE STUDY</p> <p>Christine Bouamalay Network Systems Engineering, SBC, San Francisco</p> <p>Let's consider the attempt to "automate" an existing procedure which creates a simple model routing traffic demands on a network. Prototyped by an engineer, the original uses Excel spreadsheets with embedded macros. What's the best design approach to use in "growing" this into a web application? We'll compare and contrast several approaches: "traditional" procedural coding in Perl; object-oriented using Java/JSP, and data modeling based on both an RDMBS and "XML database."</p> |
| October 9 | <p>EMERGING TECHNOLOGIES AND THE CHANGING PAYMENT SYSTEM TRUST MODEL</p> <p>Richard Hite VISA</p> <p>The value of the Visa brand is its acceptance as a de facto global currency; i.e., the best way to pay and to be paid. A major factor in the acceptance of Visa branded cards is the merchants "trust" that if the CVM is correctly performed, i.e., the merchants perform their responsibilities as required by the Visa International Operating Rules (VIOR), the merchant will be reimbursed by the Acquirer for those transactions. The Acquirer, on the other hand, trusts that the Merchant has performed the necessary steps to validate the authenticity of the cardholder. When the merchant fails in this responsibility, the bond of trust between the merchant and the Issuer is broken along with trust relationships that make up the remainder of the transactional trust chain. New technologies based on integrated circuit cards and cryptography are being used to secure these trust relationships.</p> |
| October | <p>TELECOM VALLEY-PAST, PRESENT, AND FUTURE</p> |

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| 16 | <p>George Hawley, CTO of Valo Petaluma (Co-founder and ex-CTO of Diamond Lane, bought by Nokia)</p> <p>This presentation reviews the beginnings of the formation of telecommunications equipment companies in the North Bay, the current scene, and where I think things are headed, including a review of the latest FCC findings and declarations in interpretation of the Telecom Act of 1996.</p> |
| October 23 | <p>ARCHITECTING ORACLE TECHNOLOGY FOR HIGH AVAILABILITY</p> <p>Jaywant Singh Rao Oracle Corporation, Redwood Shores</p> <p>Oracle and its partners provide all the ingredients and components to build a highly available architecture. However, choosing and implementing the architecture that best fits your availability requirements can be a daunting task. This architecture must encompass redundancy across all components, achieve fast client failover for all types of outages, and provide protection from user errors, corruption, and site disasters, while being easy to deploy, manage, and scale. This presentation describes a technical architecture that removes the complexity of designing a highly available (HA) architecture for your business. This is a straightforward, redundant, and robust architecture that prevents, detects, and recovers from different outages within a small mean time to recovery (MTTR), as well as preventing or minimizing downtime for maintenance.</p> |
| October 30 | <p>TOOLS FOR EMERGENT DESIGN</p> <p>Jason Shankel Maxis Corp., Walnut Creek</p> <p>Most modern computer games are highly linear experiences. Players attempt to achieve goals in detail-rich, authored worlds. Other games, such as SimCity and Railroad Tycoon, allow players to discover the rich complexity that can emerge from simple rules. This second category of game is more difficult to design, as the tools of emergence are not as well understood as the tools of linear storytelling. In this talk, I will describe some of the efforts we have made to formalize the design of emergent games.</p> |
| November 6 | <p>GAMES AND NETWORKS</p> <p>Christos Papadimitriou University of California, Berkeley</p> <p>The Internet is the first computational artifact that was not designed by a single entity, but emerged from the complex interaction of many. Hence, it must be</p> |

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| | <p>approached as a mysterious object, akin to the universe and the cell, to be understood by observation and falsifiable theories. Game theory plays an important role in this endeavor, since the entities involved in the Internet are optimizing interacting agents in various and varying degrees of collaboration and competition. We survey recent work considering the Internet and its protocols as equilibria in appropriate games, and striving to explain phenomena such as the power law distributions of the degrees of the Internet topology in terms of the complex optimization problems faced by each node.</p> |
| November 13 | <p>FOG</p> <p>Tom Duff Pixar, Emeryville</p> <p>Computer graphics methods have conquered water (Finding Nemo), fur (the Blockbuster hamster and rabbit commercials), hair (Stuart Little), and other challenges that nature provides. But how do you do realistic fog, which, unlike other challenging objects, has no surface and interpenetrates all other objects in a scene? We'll introduce the problem and its solution, concentrating on ideas from compositing algebra.</p> |
| November 20 | <p>SOLVING THE KNIGHT'S TOUR WITH A GENETIC ALGORITHM</p> <p>Vahl Scott Gordon California State University, Sacramento</p> <p>In this follow-on to last year's presentation, a genetic algorithm is used to solve the 8x8 knight's tour problem, and its performance is compared against standard depth-first search with backtracking. Depth-first search finds more solutions under certain conditions, but the genetic algorithm finds solutions more consistently for arbitrary initial conditions.</p> |
| November 27 | <p>THANKSGIVING - NO COLLOQUIUM</p> |
| December 4 | <p>THE GOOD, THE BAD AND THE UGLY (USER INTERFACE DESIGN)</p> <p>Matt Dewar Manager Litecraft Group, Alcatel, Petaluma</p> <p>One thing all software in use today has in common they all have some sort of user interface. The user interface is a crucial part of the software package. A product with a good user interface can be more successful than one with a poor user interface even though the latter may be more robust. Today where time-to-market grows shorter and</p> |

shorter, it is important the user interface be right the first time as we all know there is no second chance to make a first impression. We will discuss: user requirements, usability, color/layout, portability and the semantics therein. Examples will also be shown (some of which you may have already had the pleasure or the pain of using).