

COMPUTER SCIENCE COLLOQUIUM

Forty-Fifth SERIES Fall 2016

THURSDAYS AT NOON SALAZAR 2016

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| Sep. 15 | Yong Jae Lee, University of California, Davis AUTOMATICALLY LOCALIZING THE RELEVANT IMAGE REGIONS FOR WEAKLY-SUPERVISED VISUAL RECOGNITION Our group's recent and ongoing work on weakly-supervised visual recognition will be presented. In contrast to fully-supervised algorithms, the proposed methods do not require detailed localization annotations during training, and instead can learn to attend to the relevant visual regions given only image-level semantic tags that state whether an object is present or absent in the image (e.g. an image tagged with "car") or pairwise comparisons that state whether one image has more of a visual property than the other ("person A is more smiling than person B"). I will show how the proposed algorithms can produce state-of-the-art weakly-supervised results for object detection and attribute modeling, and can sometimes reach accuracy that is (nearly) on par with fully-supervised methods at a fraction of the annotation cost. |
| Sep. 22 | Hao Yue, San Francisco State University TIME-EFFICIENT INFORMATION COLLECTION IN RFID NETWORKS Radio-frequency Identification (RFID) networks nowadays have been widely used in various cyber-physical systems in the fields such as manufacturing, transportation, energy, and healthcare, for identification, tracking, and information collection due to the simplicity and low cost of RFID tags. For these cyber-physical systems, time-efficient information collection is usually desirable or even a must, but highly challenging with RFID networks because the hardware of tags is too simple to support sophisticated protocol operations and naive solutions suffer severe transmission collisions and significant communication overhead. In this talk, a new protocol for time-efficient information collection in RFID networks is presented. By using several new and lightweight techniques such as Bloom filtering and hash functions, the protocol successfully removes the unnecessary time-consuming transmissions of tag IDs in naive solutions and also efficiently minimizes transmission collisions, which drastically reduces the time and communication overhead for information collection. |
| Sep. 29 | Jason Shankel, Sr. Gameplay Engineer @ FableLabs NO, SERIOUSLY, WHAT IS A MONAD? Functional programming has experienced a surge in mainstream software development in recent years. I will cover the basics of functional programming, emergence of the new mixed functional/imperative paradigm and answer the burning question, just what the heck is a monad anyway? |
| Oct. 06 | Eric Paulos, University of California, Berkeley HYBRID ECOLOGIES: DISOBEDIENT OBJECTS, UNEXPECTED LANDSCAPES, AND HUMAN WONDERMENT This talk will present and critique a new body of evolving collaborative work at the intersection of art, computer science, and design research. It will present an argument for hybrid materials, methods, and artifacts as strategic tools for insight and innovation within computing culture. The narrative will present specific new work across three primary themes: (1) the New Making Renaissance, (2) Participation, Activism, and Micro-Volunteerism, (3) Neo-Wearables inducing Epidermis and Cosmetic Computing, and (4) Bio-Electric Hybrids. Finally, it will present and question emerging materials and strategies from the perspective of engineering, design, and new media. |
| Oct. 13 | Bruce Edward DeBruhl, California Polytechnic State University, San Luis Obispo TRENDS IN AUTOMOTIVE SECURITY In 1913 the introduction of the assembly line enabled the mass production of personal vehicles that revolutionized the world. Personal vehicles have, traditionally, been self-contained such that all communications were internal to the car. Because of this, automotive security has previously focused on 2 tasks: preventing theft and improving vehicle safety. With continued growth of vehicle-to-vehicle communications, automotive security has now fundamentally changed. To secure tomorrow's vehicles, it is necessary to reconsider how we design and secure cars. In this talk, we discuss the security implications of recent trends in collaborative and autonomous vehicles. |
| Oct. 20 | Brian Thoms, California State University, Channel Islands TOWARDS A SENTIMENT ANALYZING DISCUSSION-BOARD The design and evaluation of a sentiment analyzing discussion board was used to support learning and interaction within an existing online social networking (OSN) system. More specifically, this research introduces an innovative extension to learning management software (LMS) that combines real-time sentiment analysis with the goal of fostering student engagement and course community. In this research we perform data mining to extract sentiment on over 6,000 historical discussion board posts. This initial data was analyzed for sentiment and interaction patterns and used as the guiding design principle for redesigning an existing asynchronous online discussion board (AOD). The redesign incorporates a sentiment analyzer, which allows users to analyze the sentiment of their individual contributions before submitting. Through a controlled experiment the software was measured using content analysis, social network analysis and survey data. |
| Oct. 27 | Jonathan Bachrach, University of California, Berkeley LET THEM EAT ROBOTS We are in the midst of a new industrial revolution creating more powerful products with less human labor. How do we reap the benefits of this increased productivity? Unfortunately, automation is rapidly replacing jobs. How do we suppress mass riots and feed starving people? Guaranteed minimum income has been proposed as at least a back stop, but there are many problems with this, not the least of which is paying for it. This talk introduces the rough idea of a robot given to each person upon birth to supply his/her needs and to supplement any guaranteed income. I go into what this entails and discuss the many open challenges. |
| Nov. 03 | Dorsa Sadigh, University of California, Berkeley CORRECTNESS AND CONTROL FOR HUMAN-CYBER-PHYSICAL SYSTEMS Cyber-physical systems deployed in societal-scale applications almost always interact with humans, e.g. semi-autonomous vehicles interacting with drivers in the car or on the road, semi-autonomous aerial vehicles interacting with human operators, or medical robots interacting with doctors. Due to the safety-critical nature of these human-cyber-physical systems (h-CPS), we, as designers, need to be able to provide guarantees about their safety and performance. My work focuses on creating a new formal design methodology for control and verification of h-CPS closely interfacing with data-driven models in order to ensure provable guarantees. |
| Nov. 10 | Sergio E. Baranzini, University of California, San Francisco BIG DATA ON A NETWORK: MASSIVE INTEGRATION OF DOMAIN KNOWLEDGE FOR DRUG REPURPOSING The time and resources spent in drug development are exorbitant. In parallel, the probabilities that a given lead compound makes it to the clinic are minuscule. Even with the discovery of a few repurposing strategies, the search for a potential repositioning example is still very much trial and error. A paradigm shift is needed if safer, more effective therapeutics are to be developed at a pace that matches the societal demands for treating an ever-increasing segment of the population affected by chronic illnesses, including multiple sclerosis. We have developed a framework to integrate millions of experimental and clinical results in the form of a heterogeneous network, in which multiple entities (drugs, diseases, genes, etc) are connected through known relationships by mining a vast space of the entire domain knowledge in a computationally effective manner. Next machine learning approaches were used to compute the probability that any given drug would interfere with the pathogenic mechanisms of a disease of interest (as a proxy for a potential therapeutic). Our results show that a large proportion of the top predictions correspond to existing indications. However, a number of high-level predictions are not yet known indications, thus providing a compelling rationale to further explore their potential for development. The architecture of this hetnet and the initial results as well as future plans will be discussed during this presentation. |
| Nov. 17 | Oscar Morales Ponce, California State University, Long Beach COOPERATIVE MOBILE ROBOTS Cooperative mobile robots are autonomous entities capable of self-coordinate their actions to solve common problems. For example, a set of mobile robots can be used to patrol a protected area more efficient than using only one robot. Other examples are intelligent vehicles. In this scenario, vehicles can self-coordinate the maneuvers such as crossing uncontrolled junctions with minimum time or safely changing lanes. I describe some challenges and solutions that arise with the use of cooperative mobile robots. |
| Nov. 24 | THANKSGIVING BREAK (NO COLLOQUIUM) |
| Dec. 01 | STUDENT PRESENTATIONS SHORT PRESENTATIONS OF RESEARCH CARRIED OUT BY SONOMA STATE COMPUTER SCIENCE STUDENTS (Pizza during talks in Salazar 2016) |
| Dec. 08 | END OF SEMESTER CELEBRATION & AWARDS AWARDS PRESENTED TO SONOMA STATE COMPUTER SCIENCE MAJORS (Pizza during talks in Salazar 2016) |

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Parking is usually available in lots "E" and "F" and costs \$5.00

