



CITRIS Student Competition, Big Ideas

Friday, April 25, 2008: 3:00 p.m. to 5:00 p.m.

Dado and Maria Banatao Conference Room, 290 Hearst Mining Memorial Building, UC Berkeley

StatNews

Yanpei Chen, Laurent El Ghaoui, UC Berkeley

StatNews is a system that performs statistical analysis for online news text. It is motivated by the inability of the average reader to look at media reporting as a whole, and extract summary information, pin point events, or assess the quality of reporting. StatNews is able to collect a large amount online news text, apply various statistical methods to aggregate information in the texts, and display results in a visually intuitive fashion. We envision the system to be a powerful tool for the general public and for researchers in humanities and social sciences, giving them significant computational and statistical capabilities that are not yet routinely available. We believe the combination of quantitative and qualitative analysis on the media would lead to a more informed electorate, thus making a positive contribution to democratic governance.

Software Development for Civic Engagement

Elijah Saxon, UC Santa Cruz

This project would involve spending the summer with the Rainforest Action Network to assess their social networking needs based on preliminary ethnographic and social network analysis. Additionally, the author would create social networking tools, based on Crabgrass, designed to facilitate RAN's particular networks and organizational culture. Crabgrass is being written as a foundation that can be built upon and adapted with enough ease to facilitate the kind of situated development that would otherwise be too time consuming and costly.

Game-Based Disaster Emergency Response Training

Kenneth Hullett, UC Santa Cruz

Nationwide, one rescue worker is lost for every two victims rescued in collapsed structure situations; following Sept. 11, 2001, this ratio fell to 1:1. Limited physical facilities are available for training rescue workers in collapsed structure rescue. Our idea is to develop a training game for teaching collapsed structure rescue skills to members of emergency response community. In order to provide the most effective training possible, we plan to develop a scenario generator using AI planning techniques. The trainee will specify which skills they want to train, and the game will create a unique scenario that containing the appropriate challenges.

Living with Wildland Fires: Enhancing Community Resilience through Virtual Reality

Priscilla Lee Chu, Bodil Loevaas, Mary Kate Stimmler, TaiLin Huang, and Renaud Vidal, UC Berkeley

This project proposes to develop a virtual reality platform that recreates firestorm situations and to jointly train emergency responders and residents through real time interaction. In engaging in community-wide training exercise, residents and emergency responders will experientially learn how to react in fire situations and identify corrective measures to reduce their collective vulnerabilities to wildland fires.



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VillageMap: An Annotated Interactive Repository for Monitoring Rural Development Projects in India

Rabin Patra, Joyojeet Pal, and Sonesh Surana, UC Berkeley

VillageMap system is a repository of data to provide users with interactive visualizations of trends, including the ability to annotate data and express concerns. This will combine the power of interactive data visualization toolkits with the power of online social networking to create a participatory civic platform that can empower citizens to enforce government accountability.

Bringing Reliable Power and Mobile Communication to West Africa to Improve Emergency Obstetric Care

Laura Stachel, Christian Casillas, Melissa Ho, Hal Aronson, and Andrew Sproul, UC Berkeley

We propose a “proof of concept” project to demonstrate the impact that reliable power and communications will have on addressing problems of sporadic supply electricity in rural northern Nigeria. We will design and install a photovoltaic energy system retrofit to power lighting, medical equipment and communication equipment in a major municipal hospital. The proposed system will power (1) overhead surgical lighting in areas of critical need such as the operating room and labor and delivery, (2) mobile telecommunications between hospital staff and on-call physicians, and (3) existing on-site medical equipment that is currently underutilized. The designed system will be robust, durable, and nearly maintenance-free, with the goal of being easily installed in existing hospitals and clinics, all of which have unreliable/problematic power systems.

Integrated Diabetes Management

Christopher Hannemann and Sarah Beth Eisinger, UC Berkeley

Current diabetes data management techniques fall short in terms of convenience, accessibility, and useful analysis features, resulting in inadequate data management for most patients. This paper proposes the use of information technology to improve and increase both the acquisition and presentation of data for diabetic patients. A system integrating glucometers and insulin pumps with wireless data transmitters, wireless mobile devices (such as smartphones), personal computers, and a web-based records database is presented and technical and market feasibility is assessed. Such a system can leverage the power of information technology to provide significantly better analysis, feedback, and self-management tools for diabetics, potentially improving the glucose control and, subsequently, the life of millions of diabetics worldwide.



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Minimally Obtrusive Wearable Device for Continuous Interactive Cognitive and Neurological Assessment

Antoni Ivorra, Charlotte Daniels, and Boris Rubinsky, UC Berkeley

The ability to assess cognitive capabilities of individuals continuously during everyday activities could have far-reaching implications for diagnostics and treatment of many different neurological conditions. This project demonstrates the feasibility of a minimally obtrusive wearable system that can assess cognitive performance continuously throughout normal life activities by excitation of the peripheral nervous system and detection of the central nervous system response. The new concept was tested with one possible implementation as a device the size of a wristwatch which interrogates the subject by means of haptic excitation (vibration) and records the responses (subtle hand movements detected by accelerometers). The system was programmed to performed simple reaction time trials and was tested with ten volunteers during eight hours of their normal daytime activities.

Coupling Wind Generators with Deferrable Loads

Anthony Papavasiliou, Shmuel Oren, Mauricio Junca, Alex Dimakis, and Thomas Dickhoff, UC Berkeley

This proposal builds upon the fact that a significant proportion of the energy we consume is dedicated to duties which can be postponed. This flexibility creates a great opportunity for wind. In order to avoid the disturbances associated with the variability of wind power, wind generators can control flexible loads remotely and supply power within a not completely predictable yet reasonable amount of time. This process can be integrated to existing grid and power market operations, and it can be achieved using existing infrastructure. Consumers program tasks to be completed within a certain deadline and duties aggregating from different loads are scheduled according to the availability of wind power. Since load flexibility leads to significant cost savings, wind generators can offer electricity to loads at a discounted price to compensate for flexibility.

Application of Bayesian Networks to Infrastructure Risk Management

Michelle Bensi, Armen Der Kiureghian, Daniel Straub, UC Berkeley

The project members are undertaking efforts to formulate the theoretical principles required for developing a decision-support system for emergency response, recovery prioritization, and risk-management efforts relating to civil infrastructure systems. Ultimately, the team seeks to develop a prototype decision-support system that integrates advances in information technology, computer science and civil engineering and that will optimize decision-making in near-real time under uncertainty and with limited and evolving information. Achieving such a goal requires development of a unified model incorporating multiple hazards and a series of independent modules.



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Second Opinion: A Collaborative Online Game for Medical Diagnosis

Ephrat Bitton, Eric Liaw, Jijie Xu, Reid Hironaga, and Ken Goldberg, UC Berkeley

Our team is developing *Second Opinion*, a web-based game designed to build a knowledge base of medical information that can one day be used to build an adaptive diagnosis algorithm. In the game, we will invite patients to anonymously report any symptoms they may be experiencing and answer questions by players trying to diagnose their cases. The player's goal will be to give an accurate diagnosis with as few questions as possible, which will be verified when either the patient confirms the true diagnosis at a later date or when a majority of players independently agree on the diagnosis. By observing mathematically how the diagnostic process is followed by people ranging in expertise, we will be able to construct medical diagnosis paradigms and collect information on the distribution of diseases conditioned on a set of symptoms and medical history.

Remembering 7th Street: The Oakland Jazz and Blues Clubs Video Game

Digital Design Research Group (Architecture) and Interactive Storytelling Group (Journalism), UC Berkeley

Digital representation technologies are becoming a popular vehicle for the re-creation and dissemination of cultural heritage. Video game engines can be used to let users virtually "inhabit" the digitally recreated worlds made accessible via the Internet, opening up cultural sites to people who otherwise would never be exposed to them. This project aims to let people re-live and learn about an important chapter (1940s and 1950s) in the history of a neighborhood that has undergone tremendous changes. Today, there are a number of revitalization projects being proposed for Oakland's 7th Street. This project, by helping to show how that community once thrived, and how a succession of ill-fated development projects led to its demise, could help to inform decisions about issues now in the news.