

# University of Pennsylvania Department of Computer Science Senior Design Project Descriptions

## **Increasing Review Quality in Online Two-Sided Marketplaces (PID #1)**

*Alexey Komissarouk, Jessica Ouyang*

We investigated approaches to improve online review quality beyond the typical "99% of all reviews are positive" weakness of systems like eBay. Simulating a marketplace and varying review conditions through Amazon's Mechanical Turk, we identified several approaches that quantitatively boosted the signal-to-noise ratio of our reviews.



## **SAFE-Serve: A Secure Web Server and Servlet Engine Built Atop the SAFE Platform (PID #2)**

*Zach Zarrow*

SAFE-Serve is a secure web server and servlet engine built on top of the SAFE platform, which is a clean slate design for a secure host architecture. SAFE-Serve leverages the formally proven security features of SAFE to manage information flow throughout the server and enforce both confidentiality and integrity for all data and code.



## **PROTOS: A PR2 Open Tele-Operation System (PID #3)**

*Kevin Xu, Seth Shannin*

PROTOS is an immersive tele-operation system that allows a user to remotely operate a humanoid robot. The robot can be controlled in this manner to perform basic human manipulation tasks, such as picking up cups. This will provide a more natural system for controlling complex humanoid robots, such as the PR2.



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### **Eliminating Privacy Leaks in URLs (PID #4)**

*Daniel J. Kim, Kevin Su*

Uniform Resource Locators (URLs) may contain unnecessary personal information about the user embedded within its query string. Such information can lead to leaks of private information, including, but not limited to, disclosure of name, location, and medium of access. A solution to this problem is to implement a URL shortening service that employs machine learning techniques to automatically eliminate such information from URLs and provides the user with a safe way to share content without sacrificing privacy.



### **A Web Interface for Digital Audio Annotation (PID #5)**

*Chris Koenig*

Segmented and labeled audio data is vital for speech-related research, but generating significant amounts is prohibitively expensive and time-consuming. A web-based annotation interface might allow inexpensive remote workers to replace office-based ones, thereby driving down the cost of annotation without sacrificing accuracy.



### **Streaming Data Analytics with Continuous MapReduce (PID #7)**

*Cheng Luo, Thanat Owlarn*

A modification of Hadoop that enables real-time processing of streaming data. The framework implements a sliding window mechanism and uses push-based data transfer.



### **Designing Rhythm Games for Touchscreen Devices (PID #8)**

*Philip Peng*

This project focuses on designing and comparing different touchscreen user interfaces for rhythm games. This is accomplished through the development of a rhythm game for Android tablets and the analysis of collected gameplay data.



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### **Detecting Sepsis in the Intensive Care Unit (PID #9)**

*Bryan Chiang, Isabel Fan*

A consolidated alert interface / research tool to monitor patients at risk of sepsis and compare various sepsis scoring algorithms



### **DroidDTN: A Bluetooth Delay Tolerant Network on Android (PID #10)**

*Geoffroy Bablon, Evan Massop, Matt Vogel, Sam Applebaum*

DroidDTN takes a novel approach to ad-hoc networking using Android's Bluetooth API to create a dynamic, decentralized networking platform with relevant uses in crisis situations, developing countries, and many other arenas in which no existing Internet infrastructure is available.



### **Sentiment Analysis of Citations in Research Papers (PID #11)**

*Levi Cai, Cam Nguyen, Yun Fei Guo, Patrick Yeoho Yoon*

The purpose of our project was to apply sentiment analysis and machine learning techniques to observe trends within the scientific community in terms of research papers. In particular, we were interested in seeing if there was a correlation between the popularity and/or utility of a cited research paper with the phrases that are used in citing papers to describe it.



### **IWIPS: Indoor Wayfinding to Improve Patient Satisfaction (PID #12)**

*Jonathan Tao, Parker Winchester, Art Young, Pawel Przybysz*

IWIPS provides outpatients of the Perelman Center at the Hospital of the University of Pennsylvania with easy to follow directions through the large and complex infrastructure of the Center. The system accommodates the needs and preferences of users and provides administrators with the ability to disable certain paths if necessary.



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### **Texture Synthesis on Meshes with Probability Distribution Matching (PID #13)**

*Matthew Croop*

We provide a method for adding detail to three-dimensional objects. The goal is to take a small 2D image of a texture, and generate a similar texture on the surface of a 3D object.



### **Berkeley Open Infrastructure for Network Computing and MapReduce (PID #14)**

*Greyson Gregory, Vince Mannino, Alex Marple*

The purpose of this project is to implement MapReduce on the BOINC framework, allowing the BOINC community to benefit from the MapReduce paradigm. Additionally, the project breaks away from the strictly server-client paradigm in volunteer computing by implementing a new inter-client P2P communication. Such a contribution would be immediately relevant to any problem that can be solved using MapReduce and eventually relevant to any problem that could be solved using a BOINC framework that involves some P2P communication.



### **Zephyr: A Content Management System in Breeze (PID #15)**

*Nick Watson, Sam Panzer*

Breeze is a new programming language featuring native information flow integration. Our project, Zephyr, is a Breeze content management system which relies on information flow primitives for security as one of the first nontrivial interactive Breeze programs.



### **Haplotyping: Generating Haplotypes from Diploid Sequence Data (PID #16)**

*Louis Bergelson*

A software system which takes raw data from a gene sequencing machine and analyzes it to determine the two similar but distinct sequences present in a DNA sample.



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## **Application of Exhaustion Effects (PID #17)**

*Kaitlin Pollock*

A previous project showed the benefits of visual exhaustion effects in determining the fatigue level of a model. This system allows one to apply the necessary systems to display exhaustion with minimal user interaction.



## **Real-time Renderer on WebGL with Global Illumination (PID #20)**

*Prutsdom (Nop) Jiarathanakul*

The goal of this project is to bring realistic rendering with global illumination to the web platform through WebGL. The renderer uses ray tracing and photon mapping to produce direct and indirect illumination.



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