Honors Colloquium III

This is the third of three Honors Colloquiums for our undergraduate students to present their honors projects.

**Determining a Better Multi-Winner Election Algorithm**  
Jinze Gu

**Abstract:** There are a variety of ways to determine the winners of multi-winner elections. Plurality voting is the most prevalent method in the U. S. for electing government officials. During the past decade or so, municipalities across the country have adopted IRV (Instant Runoff Voting) and its multi-winner extension STV (Single Transferable Vote). Since neither Plurality nor STV are good election algorithms, we decided to focus on voting system using approval ballots to seek a better voting system that to place of Plurality voting and STV. The research will help people have a more sophisticated understanding about multi-winner election algorithms.

**The Erdos Method, Reduced Residues, and Balls in Boxes**  
Danielle Stewart

**Abstract:** The Erdos method was originally intended to be used for estimating the number of Carmichael pseudoprimes, and variations of the method is used in the generation of these pseudoprimes. In the process of generating Carmichael numbers, we choose a highly composite positive integer $m$. The Erdos method will find primes $p$ such that $p$ does not divide $m$ but $p - 1$ divides $m$. By taking the product mod $m$ of all elements in the subsets of $\text{Power}(P)$, it is clear that you end up back in $P$. The product of each subset of $\text{Power}(P)$ will cover a certain reduced residue. There are some values of $m$ for which a full cover is found. This project looks at the values of $m$ for which this could occur through the eyes of a probability theory problem called Balls in Boxes.

**Crowd Intelligence and Statistical Prediction**  
Can Jin

**Abstract:** Although people have talked about Collective Intelligence for decades, this research focuses on how this traditional topic can be applied to today’s "big data" era. How can people and computers be connected so that they act more intelligently than any individuals, groups, or computers? This project discusses the application of Human Intelligence and Machine Intelligence for making predictions and combines them to make better predictions. This UROP looked at Human Intelligence based on decision-making models and Support Vector Machines Regression of Machine Intelligence to forecast car sales.

**Thursday, May 9, 2013**  
3:00 PM - 4:00 PM  
Chemistry 150  
EVERYONE IS WELCOME