

**The University of Alabama
Department of Computer Science
Colloquium Series Speaker**

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**Applying Dimensionality Reduction Techniques
to Attack the Malicious Software Detection Problem**

**Friday, October 24th
11:00 a.m., EE 110**

Abstract:

Over the last twenty years, since the first malicious applications began appearing, malicious software creation and deployment has grown at significant rates. This growth has begun to overcome the rate at which defenders develop and deploy appropriate anti-virus signatures. To that end, researchers have been working on several alternative methods to help combat the ever growing problem. One method currently used for statically detecting whether an application is malicious comes from the genre of information retrieval, which is cosine similarity. Document similarity techniques, such as cosine similarity, have been used with great success in several document retrieval applications. One of the inhibitors with these categories of detection methods are the massive dimensions inherent to this type of data set. At present, researchers attack this ‘curse of dimensionality’ by applying feature selection techniques, such as mutual information. This talk will explore how mutual information as a method for feature selection is used in the detection of malicious software. Additionally, a competing concept of feature extraction known as random projections will be presented. It will be shown through results of preliminary experimentation that random projections outperform mutual information in detecting malicious software.

Bio:

Travis Atkison is currently a lecturer and Ph.D. candidate in the Department of Computer Science and Engineering at Mississippi State University. He received his Masters degree in Computer Science from the University of Alabama in 1997. He also received two Bachelors degrees from the University of Alabama, one in Computer Engineering and the second in Computer Science, both in 1995. During his 7 plus year employment with the US Department of Defense, Mr. Atkison lead or was a member of several research and development projects using information retrieval, data mining and intrusion detection methodologies and techniques. His current research activities involve developing static methods for detecting malicious applications.