



**The George Washington University  
Department of Computer Science  
Colloquium**

**March 3, 2008, 11:00am  
Room 736 Academic Center**

**Alvaro Cardenas, Ph.D.  
University of California, Berkeley**

**Mathematical Models for Computer Security**

**ABSTRACT**

The complexity and uncertainty of several computer and network security problems has motivated a significant amount of research in machine learning and statistical methods for computer security. While these techniques appear suitable for several problems, they were not designed to provide formal performance guarantees against intelligent and adaptive adversaries. In this talk the author presents his efforts for modeling and interpreting statistical detection and correlation rules for detecting attackers in wireless networks, intrusion detection systems, and watermarking. The last part of the talk covers his recent research efforts for the protection of cyber-physical systems.

**BIOGRAPHY**

**Alvaro Cardenas** is a postdoctoral scholar at the University of California, Berkeley, where he is a member of the Team for Research in Ubiquitous Secure Technology (TRUST). He obtained his M.S. and Ph.D. degrees from the University of Maryland, College Park. His research interests center around the interface between information security and formal analytical techniques in probability theory, information theory, game theory and machine learning.