IUPUI
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
SCHOOL OF ENGINEERING AND TECHNOLOGY
A Purdue University School Indianapolis

## Electrical and Computer Engineering

# Research Seminar

## Trusted Collaborative Computing (TCC): Challenges, Solutions and Applications

**Date/Time:** Thursday, November 6, 2008, Noon-1:00pm
**Place:** SL 165
**Speaker:** Dr. Xukai Zou


**ABSTRACT**
Information and communication technologies along with society's drive for collaboration in the modern world make "*collaborative computing*" and its applications possible and even necessary. Trust in this environment will eventually determine its success and popularity due to the human and corporate's desire for privacy and integrity. The current Internet is by design not security-oriented. Security patches and enhancement mechanisms result in more security vulnerabilities. Compared to the two-party interaction model (i.e., the client-server service model), collaborative computing environments are group-oriented, involve a large number of users and shared resources, and are complex, dynamic, distributed, and heterogeneous, including even hostile elements. Systems experience failures due to faults and attacks from hostile entities. More seriously, there are dangerous attacks from malicious internal members. Consequently, Building a trusted collaborative computing (TCC) environment is extremely difficult and requires a long term persevering endeavor. TCC is a new research and application paradigm, features with group-oriented communication and resource sharing (in a controlled manner) , applies to a broad range of applications such as multi-party military actions, tele-presence, tele-medicine, interactive & collaborative decision making, grid-computing, information distribution, and pay per view audio/video service, and is facing many open and challenging problems. In this talk, we will discuss some fundamental security functions involved in TCC including secure group communication (SGC) and controlled access to shared resources and their state-of-the-art key management solutions. We will also present a new cryptographic primitive: Access Control Polynomial, which can support various security functions in TCC uniformly and illustrate its seamless integration with Veterans Affairs' medical information system and its application to Cisco's tele-presence and video-on-demand products.


**BIOGRAPHICAL SUMMARY**
Dr. Xukai Zou is an assistant professor in the Department of Computer and Information Science, Indiana University Purdue University Indianapolis. His current research includes applied cryptography and network security, trusted collaborative computing, in particular, secure group communication (SGC) and access control in distributed and heterogeneous environments, and security in wireless networks. He has published two books and about 30 articles related to these topics. Recently, he designed an efficient and practical group key management which uniformly supports all four fundamental TCC security functions. Dr. Zou's research has been supported by NSF and Cisco.

********** **Refreshments will be served at Noon** **********