Information Assurance and Security

Andrew H. Sung and Srinivas Mukkamala
Department of Computer Science
New Mexico Tech
srinivas|sung@cs.nmt.edu

As a result of the rapidly increasing incidents of security breaches and malicious attacks, and the heightened concern for cyber terrorism, there is an increasing need for governments, organizations, enterprises, and individuals to employ enhanced security measures and security devices to protect their computer systems and information assets.

This tutorial begins with an introduction to the basic concepts and issues of information assurance. An assortment of important current topics will be discussed next, including vulnerability analysis, computer attacks (with in-depth coverage of denial of service attacks), intrusion detection, and software security assurance. Current research in selected areas will also be presented to give the audience an understanding of the technical challenges involved and the techniques being explored in information security.

The tutorial is presented at introductory level and intended for conference attendees of general interest in information security. A brief outline of the topics follows.

- **Introduction to Information Assurance**
    - Basic Concepts
    - Security Policy
    - IA Technology

- **Vulnerability Analysis**
    - System and Protocol Vulnerabilities
    - Vulnerability Scanner

- **Attack Analysis**
    - Attack Taxonomy
    - Attack Manifestation
    - Protection, Detection, and Response

- **Example: Denial of Service Attacks**
    - Different Types of DoS Attacks
    - DoS Attacks Associated with Wireless Networks
    - DoS Response and Mitigation

- **Intrusion Detection Systems**
    - Issues and Techniques of IDSs
    - Limitations of Current IDSs
    - Current Research Directions

- **Software Security**
    - Issues of Software Security
    - Software Security Testing

BIOGRAPHICAL SKETCH OF ANDREW SUNG

Andrew H. Sung is currently Professor and Chairman of the Computer Science Department of New Mexico Tech, and a founding coordinator of the school's new Information Technology Program. He is also the Associate Director for Education and Training of ICASA (*Institute for Complex Additive Systems Analysis*, a research division of New Mexico Tech performing work on information technology, information assurance, and analysis and protection of critical infrastructures as complex interdependent systems).

Andrew Sung received his Ph.D. in Computer Science from the State University of New York at Stony Brook in 1984. He joined New Mexico Tech in 1987, and served as the Computer Science department chair from 1988 to 1993, and again since January 2000. He has over 100 publications and his current research focus is information security.

BIOGRAPHICAL SKETCH OF SRINIVAS MUKKAMALA

Srinivas Mukkamala is currently a doctoral student of the Computer Science Department of New Mexico Tech. He is currently working in the areas of information assurance and security and has over 30 publications in the areas of information security.

Srinivas Mukkamala received his B.E. in Computer Science and Engineering from University of Madras in 1999, M.S. in Computer Science form New Mexico Tech. He is currently a research assistant and a student lead of the information assurance research group at New Mexico Tech.