

## Keynote

### Secure Multimedia Data Management Research Directions

Bhavani Thuraisingham  
The National Science Foundation, Arlington, VA

Multimedia data and information management systems manage multimedia data including text, images, audio and video. More and more multimedia data is now being stored on the web and effective management of this data is becoming a critical need. We also need to ensure that the data is protected from unauthorized access as well as malicious corruption.

This presentation will first discuss characteristics of multimedia data and information management systems and discuss research directions for incorporating security into such systems. It will review various security mechanisms and access control policies and discuss the applicability of these mechanisms and policies for multimedia data. It will discuss specific security challenges for text, imagery, audio and video data. Various security architectures for multimedia information systems will be examined. Trade-offs between real-time processing, security and data quality will be discussed.

The presentation will also discuss mining multimedia data management systems and examine the privacy violations that could occur through data mining. Next we will examine the development of digital libraries, which can be considered to be a special kind of multimedia data and information management systems, and discuss various developments on secure digital libraries. Access control models such as role-based access control and copyright protection method for digital libraries as well as secure information retrieval will be discussed. We will also examine the emerging developments in semantic web with respect to multimedia data and discuss some research directions in secure semantic web. Extensions to languages such as XML and RDF for secure multimedia information management will be examined.

The presentation will end with a discussion of software engineering issues for secure multimedia data and information systems. It will also examine the relationship between security engineering and software engineering for such systems as well as examine risk assessment techniques. Finally it will discuss various threats for multimedia information systems and discuss ways to overcome such threats.

#### *Biography*

Bhavani Thuraisingham is the program director for Data and Applications Security (DAS) at the National Science Foundation. Previously she was program director for Information and Data Management (IDM). In addition to her responsibilities in DAS and IDM, she is also part of a team setting directions for Bioinformatics and Geoinformatics as well as working on interagency efforts on Information technology for counter-terrorism. She is also heading the Information Management focus area for NSF's Information Technology Research program. She is on leave from the MITRE Corporation where she is chief scientist in data management in the Information Technology Directorate in Bedford Massachusetts. Since joining MITRE in January 1989, she has held various positions including lead and principal scientist and was also a department head in data and information management. Dr. Thuraisingham's research interests include secure databases, data mining, real-time databases and web data management. She is the recipient of IEEE Computer Society's 1997 Technical Achievement Award for outstanding and innovative research contributions to secure data management. She also holds three patents for MITRE on database inference control.

Dr. Thuraisingham received the M.Sc. degree from the University of Bristol and the Ph.D. degree from the University of Wales both in the United Kingdom. Prior to joining MITRE she worked in the computer industry for over 5 years in Minneapolis first at Control Data Corporation and later at Honeywell Inc. She has also served as adjunct professor of computer science for over six years first at the University of Minnesota and later at Boston University. Dr. Thuraisingham serves (or has served) on the editorial boards of IEEE Transactions on Knowledge and Data Engineering, the Journal of Computer Security and the Computer Standards and Interfaces Journal. She

has chaired over 15 conferences and workshops and has published over 400 technical papers and reports including over 50 journal articles. She is the author of five books in data management and data mining for technical managers and has edited several more in information security and data management. She is a senior member of IEEE and is also a member of ACM, the British Computer Society, and currently serves on the advisory committee in data management for IASTED. She is a frequent keynote and featured speaker worldwide.