Lecture Notes in Computer Science 3073

Commenced Publication in 1973
Founding and Former Series Editors:
Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

Springer
Berlin
Heidelberg
New York
Hong Kong
London
Milan
Paris
Tokyo

Hsinchun Chen Reagan Moore
Daniel D. Zeng John Leavitt (Eds.)

Intelligence and Security Informatics

Second Symposium on
Intelligence and Security Informatics, ISI 2004
Tucson, AZ, USA, June 10-11, 2004
Proceedings

Springer

Volume Editors

Hsinchun Chen
University of Arizona, MIS Department
Tucson, AZ 85721, USA
E-mail: hchen@eller.arizona.edu

Reagan Moore
San Diego Supercomputer Center
9500 Gilman Drive, La Jolla, CA 92093-0505, USA
E-mail: moore@sdsc.edu

Daniel D. Zeng
University of Arizona, MIS Department
Tucson, AZ 85721, USA
E-mail: zeng@bpa.arizona.edu

John Leavitt
Tucson Police Department
270 S. Stone Avenue, Tucson, AZ 85701, USA
E-mail: John.Leavitt@tucsonaz.gov

Library of Congress Control Number: 2004106662

CR Subject Classification (1998): H.4, H.3, C.2, H.2, D.4.6, D.2, K.4.1, K.5, K.6.5, I.5

ISSN 0302-9743
ISBN 3-540-22125-5 Springer-Verlag Berlin Heidelberg New York

Typesetting: Camera-ready by author, data conversion by Olgun Computergrafik
Printed on acid-free paper SPIN: 11009931 06/3142 5 4 3 2 1 0

Preface

The past two years have seen significant interest and progress made in national and homeland security research in the areas of information technologies, organizational studies, and security-related public policy. Like medical and biological research, which is facing significant information overload and yet also tremendous opportunities for new innovation, the communities of law enforcement, criminal analysis, and intelligence are facing the same challenge. As medical informatics and bioinformatics have become major fields of study, the science of "*intelligence and security informatics*" is now emerging and attracting interest from academic researchers in related fields as well as practitioners from both government agencies and industry.

Broadly defined, intelligence and security informatics is the study of the development and use of advanced information technologies and systems for national and homeland security related applications, through an integrated technological, organizational, and policy based approach. The First Symposium on Intelligence and Security Informatics (ISI 2003) was held in June 2003 in Tucson, Arizona. It provided a stimulating intellectual forum of discussions among previously disparate communities: academic researchers in information technologies, computer science, public policy, and social studies; local, state, and federal law enforcement and intelligence experts; and information technology industry consultants and practitioners.

Building on the momentum of ISI 2003, we held the Second Symposium on Intelligence and Security Informatics (ISI 2004) in June 2004 in Tucson, Arizona. ISI 2004 followed the tradition of ISI 2003 in bringing together technical and policy researchers from a variety of fields and in providing a highly interactive forum to facilitate communication and community building between government funding agencies, academia, and practitioners. From a technical perspective, we are very pleased to note that the papers accepted at ISI 2004 are of high quality and from diverse disciplines. Using ISI 2003 papers as a benchmark, there is a clear indication of tangible research progress made on many fronts both in depth and in coverage. In addition, several new research topics of significant practical relevance (e.g., trust management, information assurance, disease informatics) have emerged.

ISI 2004 was jointly hosted by the University of Arizona, the San Diego Supercomputer Center, and the Tucson Police Department. The one-and-a-half-day program included one plenary panel discussion session focusing on the perspectives and future research directions of government funding agencies, two invited panel sessions (one on terrorism research, the other on knowledge discovery and dissemination), 41 regular papers, six posters, and three panel discussion papers. In addition to the main sponsorship from the National Science Foundation, the Department of Homeland Security, and the Intelligence Technology Innovation Center, the symposium was also co-sponsored by several units within the

University of Arizona including: the Eller College of Business and Public Administration, the Management Information Systems Department, the Internet Technology, Commerce, and Design Institute, the Center for the Management of Information, the NSF COPLINK Center of Excellence, the Mark and Susan Hoffman E-Commerce Lab, the Artificial Intelligence Lab, and several other organizations including the Air Force Office of Scientific Research, the National Institute of Justice, and Silicon Graphics.

We wish to express our gratitude to all members of the symposium Program Committee and additional reviewers who provided high-quality, constructive review comments within an unreasonably short lead-time. Our special thanks go to the members of the symposium Organizing Committee, in particular, Mr. Chienting Lin, who provided significant help with managing the conference Website and compiling the proceedings, and Ms. Catherine Larson, who did a superb job in managing local arrangements. ISI 2004 was run as part of the workshop series of the Joint Conference on Digital Libraries (JCDL 2004). We wish to thank the JCDL staff for their conference support.

Our sincere gratitude goes to all of the sponsors. Last but not least, we thank Gary Strong, Art Becker, Michael Pazzani, Larry Brandt, Valerie Gregg, and Mike O'Shea for their strong and continuous support of this symposium and other related intelligence and security informatics research.

June 2004

Hsinchun Chen
Reagan Moore
Daniel Zeng
John Leavitt

ISI 2004 Organizing Committee

Symposium Co-chairs:

Hsinchun Chen	University of Arizona
Reagan Moore	San Diego Supercomputer Center
Daniel Zeng	University of Arizona
John Leavitt	Tucson Police Department

Organizing Committee:

Homa Atabakhsh	University of Arizona
Chris Demchak	University of Arizona
Kurt Fenstermacher	University of Arizona
Catherine Larson	University of Arizona
Chienting Lin	University of Arizona
Mark Patton	University of Arizona
Tim Petersen	Tucson Police Department
Mohan Tanniru	University of Arizona
Edna Reid	University of Arizona
Ajay Vinze	Arizona State University
Chuck Violette	Tucson Police Department
Feiyue Wang	University of Arizona
Leon Zhao	University of Arizona

ISI 2004 Program Committee

Yigal Arens	University of Southern California
Art Becker	Intelligence Technology Innovation Center
Brian Boesch	Corporation for National Research Initiatives
Larry Brandt	National Science Foundation
Peter Brantley	California Digital Library
Donald Brown	University of Virginia
Robert Chang	Criminal Investigation Bureau, Taiwan Police
Sudarshan Chawathe	University of Maryland
Andy Chen	National Taiwan University
Lee-Feng Chien	Academia Sinica, Taiwan
Bill Chu	University of North Carolina at Charlotte
Christian Collberg	University of Arizona
Tony Fountain	San Diego Supercomputer Center
Ed Fox	Virginia Tech
Susan Gauch	University of Kansas
Johannes Gehrke	Cornell University
Joey George	Florida State University
Victor Goldsmith	Pace University

Valerie Gregg	National Science Foundation
Bob Grossman	University of Illinois at Chicago
Steve Griffin	National Science Foundation
Alan Hevner	University of South Florida
Robert Horton	Minnesota State Archives
Eduard Hovy	University of Southern California
Joseph Jaja	University of Maryland
Paul Kantor	Rutgers University
Erin Kenneally	San Diego Supercomputer Center
Judith Klavans	Columbia University
Don Kraft	Louisiana State University
Ee-peng Lim	Nanyang Technological University, Singapore
Clifford Neuman	University of Southern California
Greg Newby	University of Alaska, Fairbanks
Jay Nunamaker	University of Arizona
Mirek Riedewald	Cornell University
Gene Rochlin	University of California, Berkeley
Olivia Sheng	University of Utah
Elizabeth Shriberg	SRI International
Mike O'Shea	National Institute of Justice
Sal Stolfo	Columbia University
Gary Strong	Department of Homeland Security
Paul Thompson	Dartmouth College
Bhavani Thuraisingham	National Science Foundation
Andrew	Whinston University of Texas at Austin
Karen White	University of Arizona
Chris Yang	Chinese University of Hong Kong
Mohammed Zaki	Rensselaer Polytechnic Institute
Maria Zemankova	National Science Foundation

Invited Panelists

Art Becker	Intelligence Technology Innovation Center
James Ellis	Memorial Institute for the Prevention of Terrorism
Johannes Gehrke	Cornell University
Valerie Gregg	National Science Foundation
Rohan Gunaratna	Institute for Defense & Strategic Studies, Singapore
Joseph Heaps	National Institute of Justice
Paul Kantor	Rutgers University
David Madigan	Rutgers University
Michael Pazzani	National Science Foundation
Edna Reid	University of Arizona
Michal Rosen-Zvi	University of California, Irvine
Marc Sageman	University of Pennsylvania
Joshua Sinai	Department of Homeland Security
Gary Strong	Department of Homeland Security

Additional Reviewers

Richard Adderley	A E Solutions
Jason Bengel	University of Kansas
Benjamin Barán	National University of Asuncion
Haidong Bi	University of Arizona
Jinwei Cao	University of Arizona
Michael Chau	University of Hong Kong
Fang Chen	University of Arizona
Li-Chiou Chen	Carnegie Mellon University
Yufeng Chen	Zhejiang University, China
Wingyang Chung	University of Arizona
Csilla Farkas	University of South Carolina
Mark Ginsburg	University of Arizona
Mark Goldberg	Rensselaer Polytechnic Institute
Dale Henderson	University of Arizona
Zan Huang	University of Arizona
Yichuan Jiang	Fudan University, China
Naren Kodali	George Mason University
Ju-Sung Lee	Carnegie Mellon University
Jorge Levera	University of Illinois at Chicago
Xiangyang Li	University of Michigan at Dearborn
Therani Madhusudan	University of Arizona
Malik Magdon-Ismail	Rensselaer Polytechnic Institute
Jian Ma	University of Arizona
Kent Marett	Florida State University
Byron Marshall	University of Arizona
Dan McDonald	University of Arizona
William Neumann	University of Arizona
Joon Park	Syracuse University
Jialun Qin	University of Arizona
Benjamin Shao	Arizona State University
Moon Sun Shin	Chungbuk National University, Korea
David Skillicorn	Queens University, Canada
Cole Smith	University of Arizona
Svetlana Symonenko	Syracuse University
Charles Tappert	Pace University
William Tolone	University of North Carolina at Charlotte
Douglas Twitchell	University of Arizona
Gang Wang	University of Arizona
Jenq-Haur Wang	Academia Sinica, Taiwan
Jiannan Wang	University of Arizona
Robert Warren	University of Waterloo, Canada
Zhengyou Xia	Nanjing University of Aeronautics and Astronautics
Jennifer Xu	University of Arizona

Christopher Yang	The Chinese University of Hong Kong
Bülent Yener	Rensselaer Polytechnic Institute
Myung-Kyu Yi	Korea University
Wei Yue	University of Texas at Dallas
Xiaopeng Zhong	University of Arizona
Yilu Zhou	University of Arizona

Table of Contents

Part I: Full Papers

Bioterrorism and Disease Informatics

Data Access Control, Privacy, and Trust Management

Data Management and Mining

Deception Detection

Information Assurance and Infrastructure Protection

Monitoring and Surveillance

Security Policies and Evaluation

Social Network Analysis

Part II: Short Papers

Deception Detection

Data/Text Management and Mining

Information Assurance and Infrastructure Protection

Part III: Extended Abstracts for Posters