



# ISI 2008

## 2008 IEEE International Conference on Intelligence and Security Informatics



**June 17 – 20, 2008, Taipei, Taiwan**  
Conference Venue: Grand Formosa Regent Hotel

**Hosted by:**



Central Police University, Taiwan



National Taiwan University of Science and Technology, Taiwan



Institute of Information Science, Academia Sinica, Taiwan



National Taiwan University, Taiwan

IEEE Catalog Number: CFP08ITI-PRT

ISBN: 978-1-4244-2414-6

Library of Congress: 2008903429

# Table of Contents

Preface .....	ix
Message from the Program Chairs .....	xi
Conference Organizers .....	xii
Program Committee .....	xv
Sponsors .....	xviii
Programs.....	xix
Keynote Talks .....	xxiv
Invited Talks.....	xxix
Technical Papers .....	xliii

## PART I: Long Papers

### Knowledge Discovery and Text Mining

Analysis of Cyberactivism: A Case Study of Online Free Tibet Activities..... <i>Tianjun Fu and Hsinchun Chen</i>	1
Developing Ideological Networks using Social Network Analysis and Writeprints: A Case Study of the International Falun Gong Movement .....	7 <i>Yi-Da Chen, Ahmed Abbasi and Hsinchun Chen</i>
Detecting Deception in Testimony.....	13 <i>A. Little and D.B. Skillicorn</i>
Subverting Prediction in Adversarial Settings .....	19 <i>J.G. Dutrisac and D.B. Skillicorn</i>
Analyzing Content Development and Visualizing Social Interactions in Web Forum.....	25 <i>Christopher C. Yang and Tobun D. Ng</i>
Link Analysis Based on Webpage Co-occurrence Mining – a Case Study on a Notorious Gang Leader in Taiwan .....	31 <i>Yi-Ting Peng and Jau-Hwang Wang</i>
A Study on Early Decision Making in Objectionable Web Content Classification .....	35 <i>Lung-Hao Lee, Cheng-Jye Luh and Chih-Jie Yang</i>
Information Sharing and Privacy Protection of Terrorist or Criminal Social Networks .....	40 <i>Christopher C. Yang</i>
A Framework for Privacy-Preserving Cluster Analysis.....	46 <i>Benjamin C. M. Fung, Ke Wang, Lingyu Wang and Mourad Debbabi</i>

WikiNetViz: Visualizing Friends and Adversaries in Implicit Social Networks .....	52
<i>Minh-Tam Le, Hoang-Vu Dang, Ee-Peng Lim and Anwitaman Datta</i>	
Constrained K-Closest Pairs Query Processing Based on Growing Window in Crime Databases .....	58
<i>Shaojie Qiao, Changjie Tang, Huidong Jin, Shucheng Dai and Xingshu Chen</i>	
Distributed Processing of Event Data and Multi-faceted Knowledge in a Collaboration Federation .....	64
<i>Stanley Y.W. Su, Howard Beck, Seema Degwekar, Jeff DePree, Xuelian Xiao, Chen Zhou and Minsoo Lee</i>	
A Latent Semantic Indexing and WordNet based Information Retrieval Model for Digital Forensics .....	70
<i>Lan Du, Huidong Jin, Olivier de Vel and Nianjun Liu</i>	

## **Terrorism Informatics**

Bioterrorism Event Detection Based on the Markov Switching Model: A Simulated Anthrax Outbreak Study .....	76
<i>Hsin-Min Lu, Daniel Zeng and Hsinchun Chen</i>	
Simulating Bioterrorism through Epidemiology Approximation .....	82
<i>Ryan Layfield, Murat Kantarcioglu and Bhavani Thuraisingham</i>	
Discovery of Improvised Explosive Device Content in the Dark Web .....	88
<i>Hsinchun Chen</i>	
IEDs in the Dark Web: Genre Classification of Improvised Explosive Device Web Pages .....	94
<i>Hsinchun Chen</i>	
Cyber Extremism in Web 2.0: An Exploratory Study of International Jihadist Groups.....	98
<i>Hsinchun Chen, Sven Thoms and Tianjun Fu</i>	
Sentiment and Affect Analysis of Dark Web Forums: Measuring Radicalization on the Internet.....	104
<i>Hsinchun Chen</i>	

## **Emergency Response and Infrastructure Protection**

RiskPatrol: A Risk Management System Considering the Integration Risk Management with Business Continuity Processes.....	110
<i>Shi-Cho Cha, Pei-Wen Juo, Li-Ting Liu and Wei-Ning Chen</i>	
A Game Theory Approach for an Emergency Management Security Advisory System.....	116
<i>Yi-Ming Chen, Dachrahn Wu and Cheng-Kuang Wu</i>	
Efficient and Complete Remote Authentication Scheme with Smart Cards.....	122
<i>Wen-Gong Shieh and Wen-Bing Horng</i>	
Reading Order Independent Grouping Proof for RFID Tags.....	128
<i>Yuanhung Lien, Xuefei Leng, Keith Mayes and Jung-Hui Chiu</i>	

## Cyber Security

Identity Management Architecture.....	137
<i>Uwe Glaesser and Mona Vajihollahi</i>	
Signtiming Scheme based on Aggregate Signatures.....	145
<i>Duc-Phong Le, Alexis Bonnecaze and Alban Gabillon</i>	
PRM-Based Identity Matching Using Social Context .....	150
<i>Jiexun Li, G. Alan Wang and Hsinchun Chen</i>	

## Intrusion Detection

Unknown Malcode Detection via Text Categorization and the Imbalance Problem.....	156
<i>Robert Moskovitch, Dima Stopel, Clint Feher, Nir Nissim and Yuval Elovici</i>	
Automated Network Feature Weighting-Based Anomaly Detection.....	162
<i>Dat Tran, Wanli Ma and Dharmendra Sharma</i>	
Intrusion Activity Projection for Cyber Situational Awareness .....	167
<i>Shanchieh J. Yang, Stephen Byers, Jared Holsopple, Brian Argauer and Daniel Fava</i>	
Advanced Sensor Fusion Technique for Enhanced Intrusion Detection .....	173
<i>Ciza Thomas and Narayanaswamy Balakrishnan</i>	
A Real-time Network Intrusion Detection System Based on Incremental Mining Approach.....	179
<i>Ming-Yang Su, Kai-Chi Chang, Hua-Fu Wei and Chun-Yuen Lin</i>	

## PART II: Short Papers

### Knowledge Discovery and Text Mining

Hiding Clusters in Adversarial Settings.....	185
<i>J.G. Dutrisac and D.B. Skillicorn</i>	
Models and methods for prediction problem of evolving graphs .....	188
<i>Anurat Chapanond and Mukkai S. Krishnamoorthy</i>	
A Locality Model of the Evolution of Blog Networks.....	191
<i>Mark Goldberg, Malik Magdon-Ismail, Stephen Kelley and Konstantin Mertsalov</i>	
Novel Position-Coded Methods for Mining Web Access Patterns .....	194
<i>Wenjia Wang and Phuong Thanh Cao-Thai</i>	
A Template Alignment Algorithm for Question Classification .....	197
<i>Cheng-Lung Sung, Min-Yuh Day, Hsu-Chun Yen and Wen-Lian Hsu</i>	
Swarm Intelligence Based Rough Set Reduction Scheme for Support Vector Machines .....	200
<i>Ajith Abraham and Hongbo Liu</i>	

A Study of Anti-robot Agent Mechanisms and Process on Online Games .....	203
<i>N.W. Lo and Shiou-Hung Chen</i>	
Botnets, and the CyberCriminal Underground.....	206
<i>Clinton J. Mielke II and Hsinchun Chen</i>	
An Integrated Approach to Mapping Worldwide Bioterrorism Research Capabilities .....	212
<i>Yan Dang, Yulei Zhang, Nichalin Suakkaphong, Cathy Larson and Hsinchun Chen</i>	
<b>Cyber Security, Emergency Response, and Infrastructure Protection</b>	
Anonymous Attribute Authentication Scheme Using Self-Blindable Certificates .....	215
<i>Shinsaku Kiyomoto and Toshiaki Tanaka</i>	
Keying Material Based Key Pre-distribution Scheme .....	218
<i>Zhihong Liu, Jianfeng Ma, Qiping Huang and SangJae Moon</i>	
Secure Remote Control Model for Information Appliances .....	222
<i>Wen-Gong Shieh, Jian-Min Wang and Wen-Bing Horng</i>	
Efficient Keyword Index Search over Encrypted Documents of Groups .....	225
<i>Hyun-A Park, Justin Zhan, Gary Blosser and Dong Hoon Lee</i>	
Data Hiding Using VQ Index File.....	230
<i>Yu-Jie Chang and Ja-Chen Lin</i>	
A New On-line Signature Verification by Spatio-Temporal Neural Network.....	233
<i>Maryam Moghadam Fard, Mehdi Moghadam Fard and Nasser Mozayani</i>	
Multiplicatively-Weighted Order-k Minkowski-Metric Voronoi Models for Disaster Decision Support Systems .....	236
<i>Ickjai Lee and Christopher Torpelund-Bruin</i>	
Restoration of Linear Motion and Out-of-Focus Blurred Images in Surveillance Systems .....	239
<i>Chung-Hao Chen, Te-Yu Chien, Wen-Chao Yang and Che-Yen Wen</i>	
A Novel Risk Assessment System for Port State Control Inspection .....	242
<i>Zhong Gao, Guanming Lu, Mengjue Liu and Meng Cui</i>	
<b>Intrusion Detection</b>	
A Study on the Feature Selection of Network Traffic for Intrusion Detection Purpose.....	245
<i>Wanli Ma, Dat Tran and Dharmendra Sharma</i>	
Depth Evaluation Intrusion Detection using Coloured Stochastic Petri Nets.....	248
<i>Chien-Chuan Lin and Ming-Shi Wang</i>	
Anomaly Detection in High-dimensional Network Data Streams: A Case Study .....	251
<i>Ji Zhang, Qigang Gao and Hai Wang</i>	

A Fast Algorithm for Data Erasure .....	254
<i>Guomeng Wang and Yanping Zhao</i>	

### **PART III: Posters**

KARIS: A multiple-scheme framework for encryption based on an annotation model for enhanced information security .....	257
<i>Robert Charles</i>	
The Performance Analysis of Anti- terrorism Intelligence from Taiwan's Investigation Bureau of the Ministry of Justice .....	259
<i>Yu-Ping Fan, Cheng-Wei Chen</i>	
An Effective Surveillance Video Retrieval Method based upon Motion Detection.....	261
<i>Shih-Hsuan Chiu, Che-Yen Wen and Wei-Chieh Kao</i>	
A Study of the Identification of Authorship for Chinese Texts .....	263
<i>Jian Zhang and Tianfang Yao</i>	
Design and Implementation of Honeypot Systems Based on Open-Source Software.....	265
<i>Chao-Hsi Yeh and Chung-Huang Yang</i>	
Unknown Malcode Detection – A Chronological Evaluation .....	267
<i>Robert Moskovitch, Clint Feher and Yuval Elovici</i>	
A Study on Critical Infrastructure Information Technology Malfunction Controls -- Illustration of Taiwan .....	269
<i>Kwo-Jean Farn, Shu-Kuo Lin, Kuo-Sui Lin and Chung-Huang Yang</i>	
Visual Cryptography (VC) with Non-expanded Shadow Images: Hilbert-curve Approach .....	271
<i>Sen-Jen Lin, Ja-Chen Lin and Wen-Pinn Fang</i>	
A New Classifier for Numerical Incomplete Data .....	273
<i>Jun Wu, Dong-Hun Seo, Chi-Hwa Song and Won Don Lee</i>	
Transport Security using Mobile Technology.....	275
<i>Pankaj Panjiyar, Pradeep Mourya, Neeraj Bansal, Prateek Srivastava and Asim Mukherjee</i>	
Sem@ntica: A system for semantic extraction and logical querying of text corpora.....	277
<i>Daniel W. McMichael, Raymond Fu, Simon Williams, and Geoff A. Jarrad</i>	
Evaluating AVDL Descriptions for Web Application Vulnerability Analysis.....	279
<i>Ha Thanh Le and Peter Kok Keong Loh</i>	
Preparedness for Post-Disaster Internet Traffic Management .....	282
<i>Jan-Mou Li, Chung-Hao Chen, Shang-Hsing Hsieh, Wen-Chao Yang and Che-Yen Wen</i>	
An Efficient Montgomery Exponentiation Algorithm for Public-Key Cryptosystems .....	284
<i>Chia-Long Wu, Der-Chyuan Lou and Te-Jen Chang</i>	

User-Centered Evaluation of Question Answering Systems.....	286
<i>Chorng-Shyong Ong, Min-Yuh Day, Kuo-Tay Chen and Wen-Lian Hsu</i>	
A New Online Auction with Convertible Authenticated Encryption and Authentication.....	288
<i>Guo-Lun Luo and Henry Ker-Chang Chang</i>	
A Study of Integrated Criminal Justice Data Base System .....	290
<i>Weiping Chang, ChiChao Lu and WenYuan Jen</i>	
An Novel Two Layer User Identification Method.....	292
<i>Wen-Pinn Fang, Hong-Ru Lee and Fang-Pan Lin</i>	
An Extended Security Framework for e-Government .....	294
<i>Walid Al-Ahmad and Reem Al-Kaabi</i>	
<b>Author Index .....</b>	<b>297</b>