

# **2012 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining**

**(ASONAM 2012)**

**Istanbul, Turkey  
26 – 29 August 2012**

**Pages 1-678**



**IEEE Catalog Number: CFP1234H-PRT  
ISBN: 978-1-4673-2497-7**

# 2012 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining

## ASONAM 2012

### Table of Contents

Message from the General Chairs.....	xxi
Message from the Program Chairs.....	xxii
Message from the Steering Chair.....	xxiii
ASONAM 2012 Program Committee.....	xxiv
ASONAM 2012 Organizing Committee.....	xxx
Message from the FOSINT-SI Local Chairs.....	xxxii
FOSINT-SI 2012 Organizing Committee.....	xxxiii
FOSINT-SI 2012 Program Committee.....	xxxiv
Message from the HI-BI-BI Program Chairs.....	xxxvii
HI-BI-BI 2012 Organizing Committee.....	xxxviii
HI-BI-BI 2012 Program Committee.....	xxxix
Panel and Keynotes.....	xli
Tutorials.....	xlili

---

#### Contextual Social Network Analysis and Mining

Large Social Networks Can Be Targeted for Viral Marketing with Small Seed Sets .....	1
<i>Paulo Shakarian and Damon Paulo</i>	
The Trilemma of Network Analysis .....	9
<i>Isadora Dorn, Andreas Lindenblatt, and Katharina A. Zweig</i>	
Link and Node Analysis of Gender Based Collaborations in Turkish Social Sciences .....	15
<i>Bülent Özel</i>	
Semantic Expansion of Tweet Contents for Enhanced Event Detection in Twitter .....	20
<i>Ozer Ozdakis, Pinar Senkul, and Halit Oguztuzun</i>	
Social-Based Conceptual Links: Conceptual Analysis Applied to Social Networks .....	25
<i>Erick Stattner and Martine Collard</i>	

## Application of Social Network Analysis and Mining

Evolutionary Community Detection for Observing Covert Political Elite Cliques .....	30
<i>Jyi-Shane Liu, Ke-Chih Ning, and Wan-Chun Chuang</i>	
Measuring Topological Robustness of Networks under Sustained Targeted Attacks .....	38
<i>Mahendra Piraveenan, Shahadat Uddin, and Kon Shing Kenneth Chung</i>	
Analyzing User Retweet Behavior on Twitter .....	46
<i>Zhiheng Xu and Qing Yang</i>	
Applying SNA for the Characterization of the Spatial Organization of XiaoLin Village .....	51
<i>Yun-Shang Chiou and Ying-Ting Huang</i>	
Finding a Maximum Clique Using Ant Colony Optimization and Particle Swarm Optimization in Social Networks .....	58
<i>Mohammad Soleimani-Pouri, Alireza Rezvanian, and Mohammad Reza Meybodi</i>	
Microblogging in the Enterprise: A Few Comments are in Order .....	62
<i>Charalampos Chelmiss and Viktor K. Prasanna</i>	
Stock Market Investment Advice: A Social Network Approach .....	71
<i>Negar Koochakzadeh, Keivan Kianmehr, Atieh Sarraf, and Reda Alhaji</i>	
Global Similarity in Social Networks with Typed Edges .....	79
<i>D.B. Skillicorn and Q. Zheng</i>	
Measuring the Importance of Users in a Social Network Based on Email Communication Patterns .....	86
<i>Pawel Lubarski and Mikołaj Morzy</i>	
Network of Practices: A Case Study of Knowledge Competition of School Technology Coordinators .....	91
<i>Fang-Ling Lin and Guey-Fa Chiou</i>	
A Multi-Classifer System for Sentiment Analysis and Opinion Mining .....	96
<i>Luana Bezerra Batista and Sylvie Ratté</i>	
On Measurement of Influence in Social Networks .....	101
<i>Behnam Hajian and Tony White</i>	
Ranking News Articles Based on Popularity Prediction .....	106
<i>Alexandru Tatar, Panayotis Antoniadis, Marcelo Dias de Amorim, and Serge Fdida</i>	
@Phillies Tweeting from Philly? Predicting Twitter User Locations with Spatial Word Usage .....	111
<i>Hau-wen Chang, Dongwon Lee, Mohammed Eltaher, and Jeongkyu Lee</i>	
Analyzing Stock Market Movements Using Twitter Sentiment Analysis .....	119
<i>Tushar Rao and Saket Srivastava</i>	
Predicting User-to-content Links in Flickr Groups .....	124
<i>Sumit Negi and Santanu Chaudhury</i>	

What's in Twitter: I Know What Parties are Popular and Who You are Supporting Now! .....	132
<i>Antoine Boutet, Hyoungshick Kim, and Eiko Yoneki</i>	
Analyzing Voting Behavior in Italian Parliament: Group Cohesion and Evolution .....	140
<i>Alessia Amelio and Clara Pizzuti</i>	
Comparison of Co-authorship Networks across Scientific Fields Using Motifs .....	147
<i>Sarvenaz Choobdar, Pedro Ribeiro, Sylwia Bugla, and Fernando Silva</i>	
Link Prediction for Bipartite Social Networks: The Role of Structural Holes .....	153
<i>Shuang Xia, BingTian Dai, Ee-Peng Lim, Yong Zhang, and Chunxiao Xing</i>	
Where's the Money? The Social Behavior of Investors in Facebook's Small World .....	158
<i>Liang Yuxian Eugene and Soe-Tsyr Daphne Yuan</i>	
Subgraph Extraction for Trust Inference in Social Networks .....	163
<i>Yuan Yao, Hanghang Tong, Feng Xu, and Jian Lu</i>	
Towards Maximising Cross-Community Information Diffusion .....	171
<i>Václav Belák, Samantha Lam, and Conor Hayes</i>	
Visual Analysis of Dynamic Networks Using Change Centrality .....	179
<i>Paolo Federico, Jürgen Pfeffer, Wolfgang Aigner, Silvia Miksch, and Lukas Zenk</i>	
Tag Ranking by Linear Relational Neighbourhood Propagation .....	184
<i>Boris Chidlovskii</i>	
Examining Multi-factor Interactions in Microblogging Based on Log-linear Modeling .....	189
<i>Zhilin Luo, Xintao Wu, Wandong Cai, and Dong Peng</i>	
 <b>Data Models for Social Networks and Social Media</b>	
A Bayesian Hierarchical Approach for Exploratory Analysis of Communities and Roles in Social Networks .....	194
<i>Gianni Costa and Riccardo Ortale</i>	
User Features and Social Networks for Topic Modeling in Online Social Media .....	202
<i>Bo Hu, Zhao Song, and Martin Ester</i>	
Collective Churn Prediction in Social Network .....	210
<i>Richard J. Oentaryo, Ee-Peng Lim, David Lo, Feida Zhu, and Philips K. Prasetyo</i>	
Knowing a Good Show When You See One .....	215
<i>James Lanagan</i>	
Entrepreneurs' Networks: Size, Diversity and Composition Shaped by Cultures of Rationality and Trust .....	220
<i>Thomas Schott and Maryam Cheraghi</i>	

## Communities Discovery and Analysis in Large Scale Social Networks

A Game Theoretic Framework for Community Detection .....	227
<i>Patrick J. McSweeney, Kishan Mehrotra, and Jae C. Oh</i>	
Communities and Balance in Signed Networks: A Spectral Approach .....	235
<i>Pranay Anchuri and Malik Magdon-Ismael</i>	
A Hybrid Evolutionary Algorithm Based on HSA and CLS for Multi-objective Community Detection in Complex Networks .....	243
<i>Babak Amiri, Liaquat Hossain, and John Crawford</i>	
Optimal Spatial Resolution for the Analysis of Human Mobility .....	248
<i>Michele Coscia, Salvatore Rinzivillo, Fosca Giannotti, and Dino Pedreschi</i>	
A New Algorithm for Positive Influence Dominating Set in Social Networks .....	253
<i>Hassan Raei, Nasser Yazdani, and Masoud Asadpour</i>	
Relative Validity Criteria for Community Mining Algorithms .....	258
<i>Reihaneh Rabbany, Mansoreh Takaffoli, Justin Fagnan, Osmar R. Zäane, and Ricardo J.G.B. Campello</i>	
A Community Based Algorithm for Deriving Users' Profiles from Egocentric Networks .....	266
<i>Dieudonné Tchuenta, Marie-Francoise Canut, Nadine Baptiste-Jessel, André Péninou, and Florence Sedes</i>	
Percolation Computation in Complex Networks .....	274
<i>Fergal Reid, Aaron McDaid, and Neil Hurley</i>	
Churn Prediction in a Real Online Social Network Using Local Community Analysis .....	282
<i>Blaise Ngonmang, Emmanuel Viennet, and Maurice Tchuenta</i>	
Using Field of Research Codes to Discover Research Groups from Co-authorship Networks .....	289
<i>Qinxue Meng and Paul J. Kennedy</i>	
<b>Online Social Networks</b>	
A Tunable Graph Model for Incorporating Geographic Spread in Social Graph Models .....	294
<i>Rajesh Sharma and Anwitaman Datta</i>	
Predicting Personality with Social Behavior .....	302
<i>Sibel Adali and Jennifer Golbeck</i>	
Are All Social Networks Structurally Similar? .....	310
<i>Aneeq Hashmi, Faraz Zaidi, Arnaud Sallaberry, and Tariq Mehmood</i>	
AuthorRank+FOAF: Ranking for Co-Authorship Networks on the Web .....	315
<i>Lule Ahmedi</i>	
Extracting Celebrities from Online Discussions .....	322
<i>Mathilde Forestier, Julien Velcin, Anna Stavrianou, and Djamel Zighed</i>	

Relevance of SIR Model for Real-world Spreading Phenomena: Experiments on a Large-scale P2P System .....	327
<i>Daniel F. Bernardes, Matthieu Latapy, and Fabien Tarissan</i>	
You Scratch My Back, We'll Scratch Yours: Exploring "Open Entrepreneurship" in a Private-collective Community .....	335
<i>Robin Teigland, Paul M. Di Gangi, Zeynep Yetis, and Christina Huitfeldt</i>	
How do Facebookers Use Friendlists .....	343
<i>Yousra Javed and Mohamed Shehab</i>	
Mining User's Real Social Circle in Microblog .....	348
<i>Hailong Qin, Ting Liu, and Yanjun Ma</i>	
On a Triadic Approach to Connect Microstructural Properties to Social Macrostructural Patterns .....	353
<i>Yuxi Hu, Mina Doroud, and S. Felix Wu</i>	
Semi-Supervised Policy Recommendation for Online Social Networks .....	360
<i>Mohamed Shehab and Hakim Touati</i>	
Learning the Strength of the Factors Influencing User Behavior in Online Social Networks .....	368
<i>Bo Hu, Mohsen Jamali, and Martin Ester</i>	
Link Prediction: Fair and Effective Evaluation .....	376
<i>Ryan Lichtnwalter and Nitesh V. Chawla</i>	
Predicting Friends and Foes in Signed Networks Using Inductive Inference and Social Balance Theory .....	384
<i>Arti Patidar, Vinti Agarwal, and K.K. Bharadwaj</i>	
The Impact of Measurement Time on Subgroup Detection in Online Communities .....	389
<i>Sam Zeini, Tilman Göhnert, Ulrich Hoppe, and Lothar Krempel</i>	
<b>Privacy, Security and Civil Liberty Issues</b>	
On Learning Cluster Coefficient of Private Networks .....	395
<i>Yue Wang, Xintao Wu, Jun Zhu, and Yang Xiang</i>	
Network Anomaly Detection Using Co-clustering .....	403
<i>Evangelos E. Papalexakis, Alex Beutel, and Peter Steenkiste</i>	
A Guide to Differential Privacy Theory in Social Network Analysis .....	411
<i>Christine Task and Chris Clifton</i>	
Anonymizing Subsets of Social Networks with Degree Constrained Subgraphs .....	418
<i>Sean Chester, Jared Gaertner, Ulrike Stege, and S. Venkatesh</i>	
Privacy Preservation by k-Anonymization of Weighted Social Networks .....	423
<i>Maria E. Skarkala, Manolis Maragoudakis, Stefanos Gritzalis, Lilian Mitrou, Hannu Toivonen, and Pirjo Moen</i>	

PROTOSS: A Run Time Tool for Detecting Privacy Violations in Online Social Networks .....	429
<i>Özgür Kafali, Akin Günay, and Pınar Yolum</i>	
<b>Mathematical and Statistical Network Models</b>	
Exploiting and Evaluating MapReduce for Large-Scale Graph Mining .....	434
<i>Hung-Che Lai, Cheng-Te Li, Yi-Chen Lo, and Shou-De Lin</i>	
Link Prediction in a Modified Heterogeneous Bibliographic Network .....	442
<i>John Boaz Lee and Henry Adorna</i>	
Fast Exact Computation of betweenness Centrality in Social Networks .....	450
<i>Miriam Baglioni, Filippo Geraci, Marco Pellegrini, and Ernesto Lastres</i>	
Using Pregel-like Large Scale Graph Processing Frameworks for Social Network Analysis .....	457
<i>Louise Quick, Paul Wilkinson, and David Hardcastle</i>	
<b>Recommendations vs Social Networks</b>	
Enhancing Academic Event Participation with Context-aware and Social Recommendations .....	464
<i>Manh Cuong Pham, Dejan Kovachev, Yiwei Cao, Ghislain Manib Mbogos, and Ralf Klamma</i>	
Learning Rating Patterns for Top-N Recommendations .....	472
<i>Yongli Ren, Gang Li, and Wanlei Zhou</i>	
Fast Recommendation on Bibliographic Networks .....	480
<i>Onur Küçüktunç, Kamer Kaya, Erik Saule, and Ümit V. Çatalyürek</i>	
Personalization with Dynamic Group Profile .....	488
<i>Kamal Taha and Ramez Elmasri</i>	
<b>Dynamics and Evolution Patterns of Social Networks</b>	
Dealing with Disappearance of an Actor Set in Social Networks .....	493
<i>Idrissa Sarr, Rokia Missaoui, and Romain Lalande</i>	
OCTracker: A Density-Based Framework for Tracking the Evolution of Overlapping Communities in OSNs .....	501
<i>Sajid Yousuf Bhat and Muhammad Abulaish</i>	
Crawling Social Internetworking Systems .....	506
<i>Francesco Buccafurri, Gianluca Lax, Antonino Nocera, and Domenico Ursino</i>	
Dissemination Patterns and Associated Network Effects of Sentiments in Social Networks .....	511
<i>Robert Hillmann and Matthias Trier</i>	
Prediction of Arrival of Nodes in a Scale Free Network .....	517
<i>S.M. Vijay Mahantesh, Sudarshan Iyengar, M. Vijesh, Shruthi R. Nayak, and Nikitha Shenoy</i>	

Static and Dynamic Aspects of Scientific Collaboration Networks .....	522
<i>Christian Staudt, Andrea Schumm, Henning Meyerhenke, Robert Görke, and Dorothea Wagner</i>	
<b>Crime and Social Networks</b>	
Outskewer: Using Skewness to Spot Outliers in Samples and Time Series .....	527
<i>Sébastien Heymann, Matthieu Latapy, and Clémence Magnien</i>	
An Analysis of Query Forwarding Strategies for Secure and Privacy-Preserving Social Networks .....	535
<i>Michael Dürr, Marco Maier, and Kevin Wiesner</i>	
STUN: Spatio-Temporal Uncertain (Social) Networks .....	543
<i>Chanhyun Kang, Andrea Pugliese, John Grant, and V.S. Subrahmanian</i>	
Recurrent Structural Motifs Reflect Characteristics of Distinct Networks .....	551
<i>Chen-Hsiang Yeang, Liang-Cheng Huang, and Wei-Chung Liu</i>	
Diffusion Centrality in Social Networks .....	558
<i>Chanhyun Kang, Cristian Molinaro, Sarit Kraus, Yuval Shavitt, and V.S. Subrahmanian</i>	
<b>Trust and Criminal Networks</b>	
Investigating Organized Crime Groups: A Social Network Analysis Perspective .....	565
<i>Mohammad A. Tayebi and Uwe Glasser</i>	
A Semantic Triplet Based Story Classifier .....	573
<i>Betul Ceran, Ravi Karad, Ajay Mandvekar, Steven R. Corman, and Hasan Davulcu</i>	
Detecting Criminal Networks Using Social Similarity .....	581
<i>Fatih Ozgul and Zeki Erdem</i>	
The Activation of Core Social Networks in the Wake of the 22 July Oslo Bombing .....	586
<i>Pål Roe Sundsøy, Johannes Bjelland, Geoffrey Canright, Kenth Engø-Monsen, and Rich Ling</i>	
<b>Agent-Based Modeling and Multi-Actor Models</b>	
An Approach for the Blockmodeling in Multi-Relational Networks .....	591
<i>Andreas Harrer and Alona Schmidt</i>	
One-mode Projection of Multiplex Bipartite Graphs .....	599
<i>Emőke-Ágnes Horvát and Katharina A. Zweig</i>	
A Domain Specific Language Approach for Agent-Based Social Network Modeling .....	607
<i>Enrico Franchi</i>	
Capability-Weighted Group Utility Maximizer for Network Coalitional Games under Uncertainty .....	613
<i>Usha Sridhar and Sridhar Mandyam</i>	
Sociability vs Network Dynamics: Impact of Two Aspects of Human Behavior on Diffusion Phenomena .....	618
<i>Erick Stattner, Martine Collard, and Nicolas Vidot</i>	

## **Detection and Evolution of Communities**

Detecting Probabilistic Community with Topic Modeling on Sampling SubGraphs .....	623
<i>Zeng Feng Zeng and Bin Wu</i>	
On Finding Fine-Granularity User Communities by Profile Decomposition .....	631
<i>Seulki Lee, Minsam Ko, Keejun Han, and Jae-Gil Lee</i>	
Understanding Group Dynamics in Health Forums .....	640
<i>Steven P. Crain, Shuang-Hong Yang, and Hongyuan Zha</i>	
Identifying Long Lived Social Communities Using Structural Properties .....	647
<i>Mark Goldberg, Malik Magdon-Ismail, and James Thompson</i>	
Six Degrees of Separation among US Researchers .....	654
<i>Hakan Kardes, Abdullah Sevincer, Mehmet Hadi Gunes, and Murat Yuksel</i>	

## **Mathematical and Statistical Network Models**

Modeling Social Network Interaction Graphs .....	660
<i>Michael Dürr, Valentin Protschky, and Claudia Linnhoff-Popien</i>	
Finding the Mule in the Network .....	668
<i>John L. Pfaltz</i>	
How Well-Connected Individuals Help Spread Influences – Analyses Based on Preferential Voter Model .....	674
<i>Zhuo Qi Lee, Wen-Jing Hsu, and Miao Lin</i>	
Influence of the Dynamic Social Network Timeframe Type and Size on the Group Evolution Discovery .....	679
<i>Stanisław Saganowski, Piotr Bródka, and Przemysław Kazienko</i>	
Structural and Message Based Private Friend Recommendation .....	684
<i>Bharath K. Samanthula and Wei Jiang</i>	
The Geographic Flow of Music .....	691
<i>Conrad Lee and Pádraig Cunningham</i>	

## **ASONAM 2012 Demo Paper**

Interactively and Visually Exploring Tours of Marked Nodes in Large Graphs .....	696
<i>Duen Horng Chau, Leman Akoglu, Jilles Vreeken, Hanghang Tong, and Christos Faloutsos</i>	

## **ASONAM 2012 Poster Papers**

A Complex Network Analysis of the United States Air Transportation .....	699
<i>Dorothy P. Cheung and Mehmet Hadi Gunes</i>	
Community Detection in Social Networks Using Information Diffusion .....	702
<i>Alireza Hajibagheri, Hamidreza Alvari, Ali Hamzeh, and Sattar Hashemi</i>	

Layout Algorithm for Clustered Graphs to Analyze Community Interactions in Social Networks .....	704
<i>Juan David Cruz, Cécile Bothorel, and François Poulet</i>	
Personal User or Organizational User? Behavior on Microblog can Tell .....	706
<i>Yuchu Zuo, Jianmin Wang, and Fang You</i>	
User Interests Modeling in Online Forums .....	708
<i>Na Ni and Yaodong Li</i>	
Getting Clusters from Structure Data and Attribute Data .....	710
<i>David Combe, Christine Largeron, Előd Egyed-Zsigmond, and Mathias Géry</i>	
An Agglomerative Method to Construct Discrepant Cohesive Subgroups .....	713
<i>Tobias Hecking, Tilman Göhnert, and H. Ulrich Hoppe</i>	
Naturality of Network Creation Games, Measurement and Analysis .....	716
<i>Hedyeh Beyhaghi, Zahra Fahmi, Mohammad Amin Fazli, Jafar Habibi, Pooya Jalaly, and Mohammad Ali Safari</i>	
The Limitations of the BP Algorithm for Counting Cycles in Random Networks .....	718
<i>Ibrahim Sorkhoh, Khaled Mahdi, and Maytham Safar</i>	
Do-it-yourself Justice - Considerations of Social Media use in a Crisis Situation: The Case of the 2011 Vancouver Riots .....	720
<i>Caroline Rizza, Ângela Guimarães Pereira, Michel Chiaramello, and Paula Curvelo</i>	
Towards Social Version Control .....	722
<i>Ali Koc, Abdullah Uz Tansel, and Mehmet Bicer</i>	
Community Evolution and Engagement through Assortative Mixing in Online Social Networks .....	724
<i>Kon Shing Kenneth Chung, Mahendra Piraveenan, and Shahadat Uddin</i>	
A Probabilistic Inference Attack on Suppressed Social Networks .....	726
<i>Barış Altop, Mehmet Ercan Nergiz, and Yücel Saygın</i>	
Feature Analysis of Spammers in Social Networks with Active Honeypots: A Case Study of Chinese Microblogging Networks .....	728
<i>Yi Zhou, Kai Chen, Li Song, Xiaokang Yang, and Jianhua He</i>	
An Inspection Game to Provide Incentive for Cooperation with Corrupted Inspectors .....	730
<i>Yalda Kolahdooz and Mohammad Ali Safari</i>	
Graph Searching Algorithms for Semantic-Social Recommendation .....	733
<i>Dalia Sulieman, Maria Malek, Hubert Kadima, and Dominique Laurent</i>	
<b>HI-BI-BI 2012</b>	
A Web-based Medical Emergency Guiding System .....	739
<i>Jui-Hung Kao, Fei-Pei Lai, Wei-Zen Sun, Chia-Ping Shen, Huei-Ming Ma, Jin-Ming Wu, Meng-Yu Chiu, Horng-Twu Liaw, Kai-Chieh Hsu, Yan-Yu Lam, and Shih-Ching Cheng</i>	
Temporal Community Structure Patterns in Diabetes Social Networks .....	745
<i>Taridzo Chomutare, Eirik Årsand, and Gunnar Hartvigsen</i>	

Recommendation in Online Health Communities .....	751
<i>Steven P. Crain, Ke Zhou, and Hongyuan Zha</i>	
Developing an Efficient Health Clinical Application: IIOP Distributed Objects Framework .....	759
<i>Ayman N. Murshed, Wadhah Almansoori, Konstantinos F. Xylogiannopoulos, Mohamad Elzohbi, Reda Alhaji, and Jon Rokne</i>	
A Multiclass Classification Tool Using Cloud Computing Architecture .....	765
<i>Chia-Ping Shen, Chia-Hung Liu, Feng-Sheng Lin, Han Lin, Chi-Ying F. Huang, Cheng-Yan Kao, Feipei Lai, and Jeng-Wei Lin</i>	
Accurate Prediction of Response to Interferon-based Therapy in Egyptian Patients with Chronic Hepatitis C Using Machine-learning Approaches .....	771
<i>Mahmoud ElHefnawi, Mahmoud Abdalla, Safaa Ahmed, Wafaa Elakel, Gamal Esmat, Maissa Elraziky, Shaima Khamis, and Marwa Hassan</i>	
Improving Tumor Identification by Using Tumor Markers Classification Strategy .....	779
<i>Florije Ismaili and Luzana Bekiri</i>	
A Classifier to Detect Tumor Disease in MRI Brain Images .....	784
<i>Amer Al-Badarneh, Hassan Najadat, and Ali M. Alraziqi</i>	
Comparing Clustering Techniques for Real Microarray Data .....	788
<i>Vilda Purutçuoğlu Gazi and Elif Kayış</i>	
Automatic Drug Adverse Reaction Discovery from Parenting Websites Using Disproportionality Methods .....	792
<i>Jelena Hadzi-Puric and Jeca Grmusa</i>	
Newborn Screening for Phenylketonuria: Machine Learning vs Clinicians .....	798
<i>Wei-Hsin Chen, Han-Ping Chen, Yi-Ju Tseng, Kai-Ping Hsu, Sheau-Ling Hsieh, Yin-Hsiu Chien, Wuh-Liang Hwu, and Feipei Lai</i>	
Wavelet-based Multiscale Filtering of Genomic Data .....	804
<i>Mohamed Nounou, Hazem Nounou, Nader Meskin, and Aniruddha Datta</i>	
Robot-Assisted Medical Visualization with Floating Images .....	810
<i>Sandor Markon, Satoshi Maekawa, and Ahmet Onat</i>	
Security Standards for Electronic Health Records .....	815
<i>Oznur Esra Par and Ergin Soysal</i>	
Response Surface Modeling and Optimization to Elucidate the Differential Effects of Demographic Characteristics on HIV Prevalence in South Africa .....	818
<i>Wilbert Sibanda, Philip Pretorius, and Anne Grobler</i>	
<b>FOSINT-SI 2012</b>	
A Novel Framework for Spammer Detection in Social Bookmarking Systems .....	827
<i>Soghra M. Gargari and Şule Gündüz Öğüdücü</i>	
Content Mining of Microblogs .....	835
<i>M. Özgür Cingiz and Banu Diri</i>	

An Application Based on Steganography .....	839
<i>H.B. Karaman and Ş. Sađırođlu</i>	
A Model for Dynamic Integration of Data Sources .....	844
<i>Murat Obali and Bunyamin Dursun</i>	
Combining Entity Matching Techniques for Detecting Extremist Behavior on Discussion Boards .....	850
<i>Johan Dahlin, Fredrik Johansson, Lisa Kaati, Christian Mårtenson, and Pontus Svenson</i>	
Critical Infrastructure and Internal Controls .....	858
<i>Iztok Podbregar and Mojca Ferjančič Podbregar</i>	
Covertness Centrality in Networks .....	863
<i>Michael Ovelgönne, Chanhyun Kang, Anshul Sawant, and V.S. Subrahmanian</i>	
Combining Spatial Proximity and Temporal Continuity for Learning Invariant Representations .....	871
<i>Olcaı Kurşun and Tevfik Aytekin</i>	
Lessons from a Jihadi Corpus .....	874
<i>D.B. Skillicorn</i>	
Mining Divergent Opinion Trust Networks through Latent Dirichlet Allocation .....	879
<i>Nima Dokoohaki and Mihhail Matskin</i>	
Mining Hate Crimes to Figure Out Reasons Behind .....	887
<i>Fatih Ozgul, Murat Gok, Yakup Ozal, and Ahmet Celik</i>	
The Mental State of Influencers .....	890
<i>D.B. Skillicorn and C. Leuprecht</i>	
Perspective Analysis for Online Debates .....	898
<i>Sukru Tikves, Sedat Gokalp, Mhamed Temkit, Sujogya Banerjee, Jieping Ye, and Hasan Davulcu</i>	
Processes View Modeling of Identity-related Privacy Business Interoperability: Considering User-Supremacy Federated Identity Technical Model and Identity Contract Negotiation .....	906
<i>Ghazi Ben Ayed and Solange Ghernaouti-Hélie</i>	
Secret Sharing Scheme: Vector Space Secret Sharing and $\Phi$ Function .....	914
<i>Mustafa Atici</i>	
Sentiment Analysis on Social Media .....	919
<i>Federico Neri, Carlo Aliprandi, Federico Capeci, Montserrat Cuadros, and Tomas By</i>	
Uncovering Mobile Phone Users' Malicious Activities Using Open Source Tools .....	927
<i>P.A. Kotsopoulos and Y.C. Stamatıou</i>	
Tag Based Recommender System for Social Bookmarking Sites .....	934
<i>Fatemeh Ghiyafeh Davoodi and Omid Fatemi</i>	
A Hybrid Approach for Biometric Template Security .....	941
<i>Kareem Kamal A. Ghany, Hesham A. Hefny, Aboul Ella Hassanien, and Neveen I. Ghali</i>	

## **Business Applications of Social Network Analysis (BASNA 2012)**

Social Network Analysis in Organization Development Studies .....	943
<i>Gözde Cüce</i>	
An SNA-based Evaluation Framework for Virtual Teams .....	948
<i>Lamia Ben Hiba and Mohammed Abdou Janati Idrissi</i>	
Analyzing Change over Time in Organizations' Publics with a Semantic Network Include List: An Illustration with Facebook .....	954
<i>James A. Danowski</i>	
Women on Public-Company Boards: Factors That Affect their Odds of Board Membership Relative to Those of Men .....	960
<i>Renuka Hodigere and Diana Bilimoria</i>	
Sharing News Articles Using 140 Characters: A Diffusion Analysis on Twitter .....	966
<i>Devipsita Bhattacharya and Sudha Ram</i>	
Monitoring User Evolution in Twitter .....	972
<i>Claudia Lauschke and Eirini Ntoutsis</i>	
Finding Communities in Weighted Signed Social Networks .....	978
<i>Tushar Sharma</i>	
A Social Network Study of the Apple vs. Android Smartphone Battle .....	983
<i>Johannes Bjelland, Geoffrey Canright, Kenth Engø-Monsen, Pål Roe Sundsøy, and Rich S. Ling</i>	
Spatio-Temporal Web Sensors by Social Network Analysis .....	988
<i>Shun Hattori</i>	

## **Complex Social Network Analysis**

A Probabilistic Approach to Structural Change Prediction in Evolving Social Networks .....	996
<i>Krzysztof Juszczyszyn, Adam Gonczarek, Jakub M. Tomczak, Katarzyna Musial, and Marcin Budka</i>	
A Repository for Multirelational Dynamic Networks .....	1002
<i>Alexander Semenov and Jari Veijalainen</i>	
Capturing Actor-level Dynamics of Longitudinal Networks .....	1006
<i>Shahadat Uddin, Kon Shing Kenneth Chung, and Mahendra Piraveenan</i>	
Social Influence Estimation for Short Texts in Plurk .....	1012
<i>Han-Chih Liu and Jenq-Haur Wang</i>	
A Social Network Analysis of Interlocking Directorates in French Firms .....	1018
<i>Sana Elouaer-Mrizak</i>	
T-Recs: Time-aware Twitter-based Drug Recommender System .....	1027
<i>Ahmed Abdeen Hamed, Rebecca Roose, Marlon Branicki, and Alan Rubin</i>	
Classification Analysis in Complex Online Social Networks Using Semantic Web Technologies .....	1032
<i>Marek Opuszko and Johannes Ruhland</i>	

“How Well Do We Know Each Other?” Detecting Tie Strength in Multidimensional Social Networks .....	1040
<i>Luca Pappalardo, Giulio Rossetti, and Dino Pedreschi</i>	
Distributed Assessment of Network Centralities in Complex Social Networks .....	1046
<i>Klaus Wehmuth and Artur Ziviani</i>	
Cyclic Entropy of Complex Networks .....	1050
<i>Ibrahim Sorkhoh, Khaled Mahdi, and Maytham Safar</i>	
Predicting Social Network Measures Using Machine Learning Approach .....	1056
<i>Radosław Michalski, Przemysław Kaziemko, and Dawid Król</i>	
<b>Cyber Security of Online Social Network</b>	
Fraud Detection: Methods of Analysis for Hypergraph Data .....	1060
<i>Anna Leontjeva, Konstantin Tretyakov, Jaak Vilo, and Taavi Tamkivi</i>	
Studying User Footprints in Different Online Social Networks .....	1065
<i>Anshu Malhotra, Luam Totti, Wagner Meira Jr., Ponnurangam Kumaraguru, and Virgílio Almeida</i>	
FakeBook: Detecting Fake Profiles in On-Line Social Networks .....	1071
<i>Mauro Conti, Radha Poovendran, and Marco Secchiero</i>	
An Improved Model of Trust-aware Recommender Systems Using Distrust Metric .....	1079
<i>Ali Nazemian, Hoda Gholami, and Fattaneh Taghiyareh</i>	
<b>International Workshop on Mining Social Networks for Decision Support (MSNDS 2012)</b>	
Optimal Clustering Selection on Hierarchical System Network .....	1085
<i>Eddie Fuller, Wenliang Tang, Yezhou Wu, and Cun-Quan Zhang</i>	
BidTerm Suggestion for Advertising Webpages .....	1090
<i>Lamiaa Mostafa</i>	
A New Model for Probabilistic Polling on Social Network .....	1095
<i>Zeinab Saeidi Masine, Bahman Damirchilo, and Vahid Shayestehnia</i>	
Entropy Based Sensitivity Analysis and Visualization of Social Networks .....	1099
<i>Ekrem Serin and Selim Balcisoy</i>	
Interlocking Directorates and Profitability: A Social Network Analysis of Fortune 500 Companies .....	1105
<i>Alton Y.K. Chua and Radhika Shenoy Balkunje</i>	
A Novel Search Engine Based on Social Relationships in Online Social Networking Website .....	1111
<i>Hsiao-Hsuan Lu, I-Hsien Ting, and Shyue-Liang Wang</i>	
Exploring Imagery-driven Service Framework on Social Network Service .....	1117
<i>Yuan-Chu Hwang and Wei-Cheng Shiau</i>	

## **Data Management in the Social Semantic Web**

Web Data Management through Crowdsourcing Upon Social Networks .....	1123
<i>Marco Brambilla and Alessandro Bozzon</i>	
An Upper Ontology for the Social Web .....	1128
<i>Jens Grabarske and Dominic Heutelbeck</i>	
An Evolutionary-Based Method for Reconstructing Conversation Threads in Email Corpora .....	1132
<i>Mostafa Dehghani, Masoud Asadpour, and Azadeh Shakery</i>	
Blackboard Data Spaces for the Elicitation of Community-based Lightweight Ontologies .....	1138
<i>P. Cristian Vasquez</i>	
An Efficient Map-Reduce Algorithm for the Incremental Computation of All-Pairs Shortest Paths in Social Networks .....	1144
<i>Sushant S. Khopkar, Rakesh Nagi, and Alexander G. Nikolaev</i>	
Density-based Community Identification and Visualisation .....	1149
<i>Michal Kozielski, Wojciech Filipowski, Dominik Popowicz, and Lukasz Warchal</i>	

## **The First International Workshop on Social Knowledge Discovery and Utilization (SKDU 2012)**

Detecting Social Bookmark Spams Using Multiple User Accounts .....	1153
<i>Yuta Sakakura, Toshiyuki Amagasa, and Hiroyuki Kitagawa</i>	
Applying Trust Metrics Based on User Interactions to Recommendation in Social Networks .....	1159
<i>Alberto Lumbreras and Ricard Gavalda</i>	
Method of Visualizing Relations between Tweets to Facilitate Discussions via Twitter .....	1165
<i>Yasuhiro Yamada, Akira Hattori, Tasuku Kobayashi, and Haruo Hayami</i>	
A Method for Local Community Detection by Finding Core Nodes .....	1171
<i>Tiantian Zhang and Bin Wu</i>	
Early and Late Fusion Methods for the Automatic Creation of Twitter Lists .....	1177
<i>Mengjiao Wang, Donn Morrison, and Conor Hayes</i>	

## **The Second Workshop on Social Network Analysis in Applications (SNAA 2012)**

Video Game Industry as a Social Network .....	1183
<i>Tony Morelli and Mehmet Hadi Gunes</i>	
Influence of Feedback from SNS Members on Consumer Behavior in Electronic Commerce .....	1189
<i>Vanessa R. Bracamonte Lesma and Hitoshi Okada</i>	
Twitter as a Tool for Predicting Elections Results .....	1194
<i>Juan M. Soler, Fernando Cuartero, and Manuel Roblizo</i>	

Identification of Group Changes in Blogosphere .....	1201
<i>Bogdan Gliwa, Stanislaw Saganowski, Anna Zygmunt, Piotr Bródka, Przemyslaw Kazienko, and Jaroslaw Kożak</i>	
Evolution of Author's Topic in Authorship Network .....	1207
<i>Sarka Zehnalova, Zdenek Horak, Milos Kudelka, and Vaclav Snašel</i>	
CoKIM: Collaborative and Social Knowledge-Based Incident Manager .....	1211
<i>José Luis López-Cuadrado, Israel González-Carrasco, Ricardo Colomo-Palacios, Rodrigo Gómez-Rodríguez, and Ángel García-Crespo</i>	
Using Location-Based Social Networks to Validate Human Mobility and Relationships Models .....	1215
<i>T. Nguyen and B.K. Szymanski</i>	
Four Degrees of Separation, Really .....	1222
<i>Paolo Boldi and Sebastiano Vigna</i>	
Enterprise Wisdom Captured Socially .....	1228
<i>Charalampos Chelmiss, Vikram Sorathia, and Viktor K. Prasanna</i>	
Real Time Distributed Community Structure Detection in Dynamic Networks .....	1236
<i>Valerie Galluzzi</i>	
 <b>The First International Workshop on Semantic Social Network Analysis and Design (SSNAD 2012)</b>	
Constructing Professional Resource Networks from Career Biographical Database .....	1242
<i>Renuka Hodigere and Diana Bilimoria</i>	
Combining Relations and Text in Scientific Network Clustering .....	1248
<i>David Combe, Christine LARGERON, Elöd Egyed-Zsigmond, and Mathias Géry</i>	
Investigation of Policy Structure in Legal Authorities of Institutions Related to Water Policy Making and Management in Iran through Network Analysis .....	1254
<i>Hannaneh Mohammadi Kangarani, Sima Rafsanjani Nezhad, Sara Rafsanjani Nezhad, and Javad Bakhshi</i>	
Studying Diffusion of Viral Content at Dyadic Level .....	1259
<i>Anita Zbieg, Błażej Żak, Jarosław Jankowski, Radosław Michalski, and Sylwia Ciuberek</i>	
Group Recommender Model for Boosting and Optimizing Customer Purchases .....	1266
<i>M. Saravanan, G. Prasad, M. Jagadeesan, Revathy Raman, and S. Rekha</i>	
An Interests Discovery Approach in Social Networks Based on Semantically Enriched Graphs .....	1272
<i>Akram Al-Kouz and Sahin Albayrak</i>	
Leveraging Social Networks to Improve Service Selection in Workflow Composition .....	1278
<i>John McDowall and Larry Kerschberg</i>	
Identifying Influential Taggers in Trust-Aware Recommender Systems .....	1284
<i>Sanjog Ray</i>	

## **The First International Workshop on Multi-agent Systems and Social Networks (WMSSN 2012)**

Clustering Social Networks to Remove Neutral Nodes .....	1289
<i>Fatemeh Hendijani Fard and Behrouz H. Far</i>	
Obstacles Incentivize Human Learning: A Network Theoretic Study .....	1295
<i>Amitash Ramesh, Soumya Ramesh, Sudarshan Iyengar, Vinod Sekhar, and C. Pandu Rangan</i>	
Pareto Optimal Allocation in Multi-agent Coalitional Games with Non-linear Payoffs .....	1301
<i>Usha Sridhar and Sridhar Mandyam</i>	
A Navigation Algorithm Inspired by Human Navigation .....	1309
<i>Vijesh M., Sudarshan Iyengar, Vijay Mahantesh SM, Amitash Ramesh, C. Pandurangan, and Veni Madhavan</i>	
Evolution of User Activity and Community Formation in an Online Social Network .....	1315
<i>Andreas Kalaitzakis, Harris Papadakis, and Paraskevi Fragopoulou</i>	
Cyber Politics: Understanding the Use of Social Media for Dissident Movements in an Integrated State Stability Framework .....	1321
<i>Daniel Goldsmith and Michael Siegel</i>	
Community Learning from External Information Sources .....	1329
<i>Sridhar Mandyam and Usha Sridhar</i>	
Landmark Identification in Complex Networks .....	1335
<i>Suhas Venkatesh, Amitash Ramesh, Udaya Shyama, and Sudarshan Iyengar</i>	
Building a Data Warehouse for Twitter Stream Exploration .....	1341
<i>Nafees Ur Rehman, Svetlana Mansmann, Andreas Weiler, and Marc H. Scholl</i>	
Web Page Prediction by Clustering and Integrated Distance Measure .....	1349
<i>G. Poornalatha and Prakash S. Raghavendra</i>	
On the T-graph of a Commutative Ring .....	1355
<i>Ahmad Abbasi</i>	

## **Author Index**