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## Tina Eliassi-Rad

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Citizenship: United States

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### Research Interests

- Data Mining and Knowledge Discovery
- Machine Learning
- Artificial Intelligence
- Cyber Security
- Network Science
- Computational Social Science
- Computational Humanities
- Big Data

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### Academic Degrees

Doctor of Philosophy in Computer Sciences, University of Wisconsin-Madison, 2001

Dissertation: *Building Intelligent Agents that Learn to Retrieve and Extract Information*

Ph.D. Advisor: Professor Jude Shavlik

Minor: Mathematical Statistics

Master of Science in Computer Science, University of Illinois at Urbana-Champaign, 1995

Masters Thesis: *Visual Support for the ISLE Simulation Environment*

Masters Advisor: Professor Mehdi Harandi

Bachelor of Science (with Distinction) in Computer Sciences, University of Wisconsin-Madison, 1993

Senior Thesis on New Heuristics for the Graph Coloring Problem

Senior Thesis Advisor: Professor Anne Condon

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### Professional Experience

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| 9/2010–...    | Assistant Professor (tenure-track), Department of Computer Science, <u>Rutgers University</u> , Piscataway, NJ  |
| 9/2009–8/2010 | Visiting Assistant Research Professor, Center for Computational Biomedicine, Imaging and Modeling (CBIM) & Department of Computer Science, <u>Rutgers University</u> , Piscataway, NJ |
| 9/2001–9/2010 | Member of Technical Staff & Principal Investigator, Center for Applied Scientific Computing, <u>Lawrence Livermore National Laboratory</u> (LLNL), Livermore, CA                      |
| 8/1997–8/2001 | Research Assistant, Machine Learning Research Group, Computer Sciences Department, <u>University of Wisconsin</u> , Madison, WI   |
| 6/1997–8/1997 | Intern, Networking and Information Exploitation Department, <u>Hughes Research Laboratories</u> (HRL), Malibu, CA   |
| 5/1996–5/1997 | Research Assistant, Machine Learning Research Group, Computer Sciences Department, <u>University of Wisconsin</u> , Madison, WI   |
| 8/1995–5/1996 | Teaching Assistant, Computer Sciences Department, <u>University of Wisconsin</u> , Madison, WI  |
| 5/1994–8/1995 | Research Assistant, Advanced Collaborative Systems Lab, Department of Computer Science, <u>University of Illinois</u> , Urbana-Champaign, IL  |
| 9/1993–5/1994 | Researcher, Construction Engineering Research Lab, <u>Army Corps of Engineers</u> , Champaign, IL   |
| 5/1992–8/1992 | Intern, Network Printer Division, <u>Hewlett-Packard Company</u> , Boise, ID  |
| 9/1991–5/1992 | Systems Programmer, High Energy Physics Department, <u>University of Wisconsin</u> , Madison, WI  |

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### Grants and Awards

- Co-PI, “Understanding and Utilizing Context-Aware Information Dissemination in Social Media,” DARPA, Program on Social Media in Strategic Communications (6.1 funding), \$387,014 (Rutgers portion only), 2012-2015

- Third Place Prize, Antivirus Research Grant/Gift Winner, sponsored by [pcantivirusreviews.com](http://www.pcantivirusreviews.com), \$300, 2011 (<http://www.pcantivirusreviews.com/Gifts-and-Grants/>)
- Co-PI, “The De-Anonymization of Consumer Networks using Wireless and Wired Call Detail Data,” Wharton Customer Analytics Initiative (only 10 grants were awarded), \$2,500, 2011
- Co-PI, “Phase I: I/UCRC: Center for Dynamic Data Analytics (CDDA),” National Science Foundation (Award #1069258), \$78,101, 2011-2012
- Senior Personnel, “Research Experience for Undergraduates (REU): Perceptual Science & Technology,” National Science Foundation, \$303,675, 2011-13.
- Co-PI, “Robustness Analysis and Anomaly Detection of Interdependent Physical and Social Networks,” Defense Threat Reduction Agency (DTRA), \$222,115 (out of \$1.06M total), 2010-2013
- PI, “Cyber Situational Awareness through Host and Network Analysis,” Lawrence Livermore National Laboratory (LLNL), \$150,000, 2010-2011
- PI, “Capturing Node-level Behavioral Structure (a.k.a. Roles) in Static and Dynamic Networks,” Lawrence Livermore National Laboratory (LLNL), \$100,000, 2010-2011
- Co-PI, “Network Pattern Recognition Project,” National Science Foundation (Award #0970179), \$35,108 (out of \$299,982 total), 2010-2011
- Co-PI, “Semantic Ontological Techniques for Analyst Reasoning (SOTAR),” Air Force Research Laboratory (AFRL), \$1,655,595 (out of \$13.5M total), 2010-2014
- Recipient, Lawrence Livermore National Laboratory, Global Security Directorate Gold Award (for work on detection of cyber attacks), \$500, 2010
- Recipient, U.S. Department of Energy, Office of Science Outstanding Mentor Award, 2010
- Recipient, Best Paper Award Runner-up, The 9<sup>th</sup> IEEE International Conference on Data Mining (ICDM’09), Miami, FL, December 2009
- Co-PI, “Learning from Presence-Only Data, With Applications in Cyber Security and Ecology,” University of California Lab-Fees Research Program Award (10% acceptance rate), \$472,748, January 2009 to December 2011
- Co-PI, “SETAC: Supercomputing Enabled Transformational Analytics Capability,” Lawrence Livermore National Laboratory – Strategic Initiative Award, \$5.1M, November 2008 to September 2010 (was renewed in FY11 for \$2.7M)
- PI, “Role Discovery in Dynamic Semantic Graphs,” Lawrence Livermore National Laboratory – Exploratory Research Award, \$854,100, October 2008 to September 2010 (was renewed in FY11 for \$456,220)
- Co-PI, “Predictive Knowledge Systems,” Lawrence Livermore National Laboratory – Strategic Initiative Award, \$12.5M, April 2006 to September 2008
- Senior Personnel, “UCLA IPAM 2005 Graduate Summer School on Intelligent Extraction of Information from Graphs and High-dimensional Data,” National Science Foundation (Award #0442015) for \$199,735, Summer 2005
- Technical point-of-contact, Lawrence Livermore National Laboratory – External Collaboration Awards to Academia, \$1.16M, Summer 2004 to Fall 2010
- Recipient, Research Award for First Year Graduate Students, University of Wisconsin-Madison, Summer 1996

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## Peer-reviewed Publications (available at <http://eliassi.org/pubs.html>)

### Journal Articles

- [1] “Correcting Evaluation Bias of Relational Classifiers with Network Cross Validation” (J. Neville, B. Gallagher, T. Eliassi-Rad, and T. Wang), *Knowledge and Information Systems (KAIS)*, Springer, January 2011.
- [2] “Massively Parallel Acceleration of a Document-Similarity Classifier to Detect Web Attacks” (C. Ulmer, M. Gokhale, B. Gallagher, P. Top, and T. Eliassi-Rad), *Journal of Parallel and Distributed Computing*, 71(2): 225-235, 2011. (acceptance rate: 21%)
- [3] “Leveraging Label-Independent Features for Classification in Sparsely Labeled Networks: An Empirical Study” (B. Gallagher and T. Eliassi-Rad), *Lecture Notes in Computer Science: Advances in Social Network Mining and Analysis*, Springer, 2009.

- [4] "Two Heads Better than One: Pattern Discovery in Time-evolving Multi-Aspect Data" (J. Sun, C. Tsourakakis, E. Hoke, and C. Faloutsos, and T. Eliassi-Rad), *Data Mining and Knowledge Discovery Journal*, 17(1):111-128, 2008. (*Special issue from top 3% of PKDD'08 accepted papers*)
- [5] "Collective Classification in Network Data" (P. Sen, G. Namata, M. Bilgic, L. Getoor, B. Gallagher, and T. Eliassi-Rad), *AI Magazine*, special issue on *AI and Networks*, 29(3):93-106, 2008.
- [6] "Visual Analysis of Large Heterogeneous Social Networks by Semantic and Structural Abstraction" (Z. Shen, K.-L. Ma, and T. Eliassi-Rad), *IEEE Transactions on Visualization and Computer Graphics, Special Issue on Visual Analytics*, 12(6):1427-1439, 2006.
- [7] "A System for Building Intelligent Agents that Learn to Retrieve and Extract Information" (T. Eliassi-Rad and J. Shavlik), *International Journal of User Modeling and User-Adapted Interaction*, special issue on *User Modeling and Intelligent Agents*, 13(4):35-88, 2003.

## Conference Papers

- [8] "Correcting Bias in Statistical Tests for Network Classifier Evaluation" (T. Wang, J. Neville, B. Gallagher, and T. Eliassi-Rad), *Proceedings of the 2011 European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD'11)*, Athens, Greece, September 2011. (*acceptance rate: 20.2%*)
- [9] "It's Who You Know: Graph Mining Using Recursive Structural Features" (K. Henderson, B. Gallagher, L. Li, L. Akoglu, T. Eliassi-Rad, H. Tong, and C. Faloutsos), *Proceedings of the 17th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD'11)*, San Diego, CA, August 2011. (*acceptance rate: 17.5%*)
- [10] "Ranking Information in Networks" (T. Eliassi-Rad and K. Henderson), *Proceedings of the 2011 International Conference on Social Computing, Behavioral-Cultural Modeling, and Prediction (SBP'11)*, College Park, MD, March 2011.
- [11] "Detecting Novel Discrepancies in Communication Networks" (J. Abello, T. Eliassi-Rad, and N. Devanur), *Proceedings of the 10th IEEE International Conference on Data Mining (ICDM'10)*, Sydney, Australia, December 2010. (*acceptance rate: 19%*)
- [12] "On the Vulnerability of Large Graphs: Measures and Fast Immunization Algorithms" (H. Tong, B.A. Prakash, C. Tsourakakis, T. Eliassi-Rad, C. Faloutsos, and D.H. Chau), *Proceedings of the 10th IEEE International Conference on Data Mining (ICDM'10)*, Sydney, Australia, December 2010. (*acceptance rate: 19%*)
- [13] "Profiling-by-Association: A Resilient Traffic Profiling Solution for the Internet Backbone" (M. Iliofotou, B. Gallagher, T. Eliassi-Rad, G. Xie, and M. Faloutsos), *Proceedings of the 6th ACM International Conference on Emerging Networking Experiments and Technologies (ACM CoNext'10)*, Philadelphia, PA, November 2010. (*acceptance rate: 19%*)
- [14] "MetricForensics: A Multi-Level Approach for Mining Volatile Graphs" (K. Henderson, T. Eliassi-Rad, C. Faloutsos, L. Akoglu, L. Li, K. Maruhashi, B. A. Prakash, and H. Tong), *Proceedings of the 16th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD'10)*, Washington, DC, July 2010. (*acceptance rate: 20%*)
- [15] "Basset: Scalable Gateway Finder in Large Graphs" (H. Tong, S. Papadimitriou, C. Faloutsos, P.S. Yu, and T. Eliassi-Rad), *Proceedings of the 14th Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD'10)*, Hyderabad, India, June 2010. (*acceptance rate: 23%*)
- [16] "HCDF: A Hybrid Community Discovery Framework" (K. Henderson, T. Eliassi-Rad, S. Papadimitriou, and C. Faloutsos), *Proceedings of the 2010 SIAM Conference on Data Mining (SDM'10)*, Columbus, OH, April 2010. (*acceptance rate: 23%*)
- [17] "Literature Search through Mixed-Membership Community Discovery" (T. Eliassi-Rad and K. Henderson), *Proceedings of the 2010 International Conference on Social Computing, Behavioral Modeling, and Prediction (SBP'10)*, Bethesda, MD, March 2010.
- [18] "Homophily in Application Layer and its Usage in Traffic Classification" (B. Gallagher, M. Iliofotou, T. Eliassi-Rad, and M. Faloutsos), *Proceedings of the 29<sup>th</sup> IEEE Conference on Computer Communications (INFOCOM'10) Miniconference*, San Diego, CA, March 2010. (*acceptance rate: 24%*)
- [19] "Evaluating Statistical Tests for Within-Network Classifiers of Relational Data" (J. Neville, B. Gallagher, and T. Eliassi-Rad), *Proceedings of the 9<sup>th</sup> IEEE International Conference on Data Mining (ICDM'09)*, Miami, FL, December 2009. (*acceptance rate: 18%; best paper award runner-up*)
- [20] "Applying Latent Dirichlet Allocation to Group Discovery in Large Graphs" (K. Henderson and T. Eliassi-Rad), *Proceedings of the 24<sup>th</sup> Annual ACM Symposium on Applied Computing (ACM-SAC'09)*, Honolulu, HI, March 2009. (*acceptance rate: 29%*)

- [21] “Fast Mining of Complex Time-Stamped Events” (H. Tong, Y. Sakurai, T. Eliassi-Rad, and C. Faloutsos), *Proceedings of the 17th ACM Conference on Information and Knowledge Management (CIKM'08)*, Napa Valley, CA, October 2008. (acceptance rate: 17%)
- [22] “Two Heads Better than One: Pattern Discovery in Time-evolving Multi-Aspect Data” (J. Sun, C. Tsourakakis, E. Hoke, C. Faloutsos, and T. Eliassi-Rad), *Proceedings of the 2008 European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD'08)*, Antwerp, Belgium, September 2008. (acceptance rate: 19%)
- [23] “Using Ghost Edges for Classification in Sparsely Labeled Networks” (B. Gallagher, H. Tong, T. Eliassi-Rad, and C. Faloutsos), *Proceedings of the 14<sup>th</sup> ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD'08)*, Las Vegas, NV, August 2008. (acceptance rate: 14%)
- [24] “Re-thinking Supercomputing for Data Intensive Problems” (T. Damkroger, T. Eliassi-Rad, M. Gokhale, J. Grosh, and S. Kohn), *Proceedings of the 2008 International Supercomputing Conference (ICS'08)*, Dresden, Germany, June 2008.
- [25] “Fast Best-Effort Pattern Matching in Large Attributed Graphs” (H. Tong, B. Gallagher, C. Faloutsos, and T. Eliassi-Rad), *Proceedings of the 13<sup>th</sup> ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD'07)*, San Jose, CA, 2007, pp. 737-746. (acceptance rate: 19%)
- [26] “A Hybrid Approach to Multiresolution Modeling of Large-Scale Scientific Data” (T. Eliassi-Rad and T. Critchlow), *Proceedings of the 20<sup>th</sup> Annual ACM Symposium on Applied Computing (ACM-SAC'05)*, Santa Fe, NM, 2005, pp. 511-518. (acceptance rate: 34%)
- [27] “The Evolution of a Hierarchical Partitioning Algorithm for Large-Scale Scientific Data: Three Steps of Increasing Complexity” (C. Baldwin, T. Eliassi-Rad, G. Abdulla, and T. Critchlow), *Proceedings of the 15<sup>th</sup> International Conference on Scientific and Statistical Data Base Management (SSDBM'03)*, Cambridge, MA, 2003, pp. 225-228. (acceptance rate: 52%)
- [28] “Statistical Modeling of Large-Scale Simulation Data” (T. Eliassi-Rad, T. Critchlow and G. Abdulla), *Proceedings of the 8<sup>th</sup> ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD'02)*, Edmonton, Alberta, Canada, 2002, pp. 488-494. (acceptance rate: 14%)
- [29] “A Theory-Refinement Approach to Information Extraction” (T. Eliassi-Rad and J. Shavlik), *Proceedings of the 18<sup>th</sup> International Conference on Machine Learning (ICML'01)*, Williamstown, MA, 2001, pp. 130-137. (acceptance rate: 32%)
- [30] “An Instructable, Adaptive Interface for Discovering and Monitoring Information on the World Wide Web” (J. Shavlik, S. Calcari, T. Eliassi-Rad, and J. Solock), *Proceedings of the 1999 International Conference on Intelligent User Interfaces (IUI'99)*, Redondo Beach, CA, 1999, pp. 157-160. (acceptance rate: 30%)

## Workshop Papers

- [31] “An Axiomatic Approach to Tie-Strength Measures” (M. Gupte and T. Eliassi-Rad), *NIPS 2011 Workshop on Computational Social Science and the Wisdom of Crowds*, Sierra Nevada, Spain, December 2011.
- [32] “Measuring Tie Strength in Implicit Social Networks” (M. Gupte and T. Eliassi-Rad), *The 3<sup>rd</sup> Workshop on Information in Networks (WIN'11)*, New York, NY, September 2011.
- [33] “Ranking Information in Networks” (T. Eliassi-Rad and K. Henderson), *The 2<sup>nd</sup> Workshop on Information in Networks (WIN'10)*, New York, NY, September 2010.
- [34] “A Renewal Theory Approach to Anomaly Detection in Communication Networks” (B. Thompson and T. Eliassi-Rad), *The 2<sup>nd</sup> Workshop on Information in Networks (WIN'10)*, New York, NY, September 2010.
- [35] “Detecting Novel Discrepancies in Highly Dynamic Information Networks” (J. Abello, T. Eliassi-Rad, and N. Devanur), *The 2<sup>nd</sup> Workshop on Information in Networks (WIN'10)*, New York, NY, September 2010.
- [36] “Continuous Time Group Discovery in Dynamic Graphs” (K. Miller and T. Eliassi-Rad), *NIPS 2009 Workshop on Analyzing Networks and Learning with Graphs*, Whistler, BC, Canada, December 2009.
- [37] “Literature Search through Mixed-Membership Community Discovery” (T. Eliassi-Rad and K. Henderson), *The 1<sup>st</sup> Workshop on Information in Networks (WIN'09)*, New York, NY, September 2009.
- [38] “DAPA-V10: Discovery and Analysis of Patterns and Anomalies in Volatile Time-Evolving Networks” (B. Thompson and T. Eliassi-Rad), *The 1<sup>st</sup> Workshop on Information in Networks (WIN'09)*, New York, NY, September 2009.
- [39] “PaCK: Scalable Parameter-Free Clustering on K-Partite Graphs” (J. He, H. Tong, S. Papadimitriou, T. Eliassi-Rad, C. Faloutsos, J. Carbonell), *Proceedings of the 2009 SIAM SDM Workshop on Link Analysis, Counterterrorism and Security (Adversarial Data Analysis)*, Reno, NV, May 2009.

- [40] “Leveraging Label-Independent Features for Classification in Sparsely Labeled Networks: An Empirical Study” (B. Gallagher and T. Eliassi-Rad), *Proceedings of the 2<sup>nd</sup> ACM SIGKDD Workshop on Social Network Mining and Analysis (SNA-KDD’08)*, Las Vegas, NV, August 2008. (acceptance rate: 61%)
- [41] “An Evaluation of Experimental Methodology for Classifiers of Relational Data” (B. Gallagher and T. Eliassi-Rad), *Proceedings of 2007 IEEE ICDM Workshop on Mining Graphs and Complex Structures (MGCS’07)*, Omaha, NE, October 2007. (acceptance rate: 30%)
- [42] “Similarity in Computational Sciences” (T. Eliassi-Rad and T. Critchlow), *Abstracts from the 2005 Learning Workshop*, Snowbird, UT, April 2005. (invited submission)
- [43] “Intelligent Agents for Web-Based Tasks: An Advice-Taking Approach” (J. Shavlik and T. Eliassi-Rad), *Working Notes of AAAI/ICML-98 Workshop on Learning for Text Categorization*, Madison, WI, July 1998.
- [44] “Building Intelligent Agents for Web-Based Tasks: A Theory-Refinement Approach” (J. Shavlik and T. Eliassi-Rad), *Proceedings of Workshop on Learning from Text and the Web*, part of *Conference on Automated Learning and Discovery (CONALD ’98)*, Pittsburgh, PA, June 1998.

### Symposium Papers

- [45] “Finding Mixed-Memberships in Social Networks” (P.S. Koutsourelakis and T. Eliassi-Rad), *Papers from the 2008 AAAI Spring Symposium – Social Information Processing (AAAI-SS’08)*, Stanford CA, March 2008.
- [46] “A Position Paper: Value of Information for Evidence Detection” (D. Roberts and T. Eliassi-Rad), *Papers from the 2006 AAAI Fall Symposium – Capturing and Using Patterns for Evidence Detection (AAAI-FS’06)*, Arlington, VA, October 2006.
- [47] “Knowledge Representation Issues in Semantic Graphs for Relationship Detection” (M. Barthelemy, E. Chow, and T. Eliassi-Rad), *Papers from the 2005 AAAI Spring Symposium – AI Technologies for Homeland Security (AAAI-SS’05)*, Stanford, CA, March 2005.

### Demos

- [48] “GRAPHITE: A Visual Query System for Large Graphs” (D. H. Chau, C. Faloutsos, H. Tong, J. Hong, B. Gallagher, and T. Eliassi-Rad), *The 8<sup>th</sup> IEEE International Conference on Data Mining (ICDM’08)*, Pisa, Italy, December 2008. (acceptance rate: 50%)

### Book Chapters

- [49] “Statistical Modeling of Large-Scale Scientific Simulation Data” (T. Eliassi-Rad, C. Baldwin, G. Abdulla, and T. Critchlow), in *New Generation of Data Mining Applications*, Eds: J. Zurada and M. Kantardzic, Wiley, February 2005.
- [50] “Intelligent Web Agents that Learn to Retrieve and Extract Information” (T. Eliassi-Rad and J. Shavlik), in *Intelligent Exploration of the Web*, Eds: P.S. Szczepaniak, F. Segovia, J. Kacprzyk, and L.A. Zadeh, Springer-Verlag, 2003.

### Edited Volumes

- [51] *Proceedings of the 12<sup>th</sup> ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (L. H. Ungar, M. Craven, D. Gunopulos, and T. Eliassi-Rad: editors), ACM Press, 2006, ISBN 1-59593-339-5.

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### Theses

- “Building Intelligent Agents that Learn to Retrieve and Extract Information”, Ph.D. dissertation, Computer Sciences Department, University of Wisconsin, Madison, WI, 2001.
- “Visual Support for the ISLE Simulation Environment”, M.S. thesis, Department of Computer Science, University of Illinois, Urbana-Champaign, IL, 1995.

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### Papers in Progress

- [1] “Scalable Nonparametric Models of Mixed Communities in Networks” (T. Eliassi-Rad), in *Handbook on Mixed Membership Models*, Eds: Edoardo Airoldi, David Blei, Elena Erosheva, Stephen E. Fienberg, and Kira Bokalders, Chapman & Hall, in preparation (tentative publication date summer 2012).
- [2] “Primordial Social Order in Online Social Networks” (T. Eliassi-Rad), in *Encyclopedia of Social Network Analysis and Mining*, (Section on Social Network Applications in Homeland Security, Terrorism, Fraud Detection, Public

Sector, Politics and Case studies), Eds: Reda Alhajj and Jon Rokne, Springer, in preparation (tentative publication date summer 2012). <http://refworks.springer.com/mrw/index.php?id=4366>

- [3] "User Reviews Ranking" (T. Eliassi-Rad) in Encyclopedia of Social Network Analysis and Mining, (Section on Social Network Applications in Business, Organizations, Industry and Case Studies), Eds: Reda Alhajj and Jon Rokne, Springer, in preparation (tentative publication date summer 2012). <http://refworks.springer.com/mrw/index.php?id=4366>
- [4] "Measuring Tie Strength in Implicit Social Networks" (M. Gupte and T. Eliassi-Rad), under peer-review, 10 pages.
- [5] "Discrepant Hash Tags and Their Users" (J. Abello, T. Eliassi-Rad, and N. Devanur), under peer-review, 8 pages.
- [6] "Entelecheia: Detecting P2P Botnets" (H. Hang, X. Wei, M. Faloutsos, T. Eliassi-Rad), under peer-review, 17 pages.
- [7] "NetSimile: An Effective and Scalable Network Similarity Approach" (M. Berlingerio, D. Koutra, T. Eliassi-Rad, C. Faloutsos), under peer-review, 12 pages.
- [8] "RoIX: Structural Role Extraction and Mining in Large Networks" (K. Henderson, B. Gallagher, T. Eliassi-Rad, H. Tong, L. Akoglu, D. Koutra, L. Li, S. Basu, and C. Faloutsos), under peer-review, 12 pages.
- [9] "Link Placement on Large Graphs: Theory and Algorithms" (H. Tong, B.A. Prakash, T. Eliassi-Rad, M. Faloutsos, and C. Faloutsos), under peer-review, 12 pages.
- [10] "iPaM: Fast and Effective Pattern Matching on Weighted Attributed Graphs" (S. Basu Roy and T. Eliassi-Rad), under peer-review, 12 pages.

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## Invited Presentations

- [1] Northern New Jersey Junior Science and Humanities Symposium, March 2012
- [2] Northeastern University, Boston, MA, December 2011
- [3] MIT, CSAIL, Cambridge, MA, December 2011
- [4] IBM Watson, Hawthorne, NY, November 2011
- [5] Lehigh University, Department of Computer Science & Engineering, Colloquium Talk, Bethlehem, PA, November 2011
- [6] UCLA IPAM, Workshop on Networks and Network Analysis for the Humanities, Los Angeles, CA, October 2011
- [7] Jive Software, Palo Alto, CA, August 2011
- [8] Lawrence Livermore National Laboratory, Center for Applied Scientific Computing, Livermore, CA, August 2011
- [9] ARS'11: Third International Workshop on Social Network Analysis, Naples, Italy, June 2011
- [10] NSF-sponsored Workshop on Social-Computational Systems (SoCS), Minneapolis, MN, June 2011
- [11] Jozef Stefan Institute, Ljubljana, Slovenia, June 2011
- [12] Ludwig-Maximilians-Universität München, Munich, Germany, June 2011
- [13] D.E. Shaw Research & Development, New York, NY, May 2011
- [14] TEDx Rutgers, Piscataway, NJ, April 2011
- [15] Rutgers University, Perceptual Science Talk Series, Piscataway, NJ, April 2011
- [16] IEEE Computer Society – North Jersey Section, Data Mining Seminar, Teaneck, NJ, April 2011
- [17] Rutgers University, Department of Computer Science, Open House, Piscataway, NJ, April 2011
- [18] NYU, Courant Institute, Machine Learning Seminar, New York, NY, April 2011
- [19] Princeton University, Machine Learning Seminar, Princeton, NJ, March 2011
- [20] High Tech Crimes Investigation Association (HTICA) – Northeast Chapter, New York, NY, March 2011
- [21] Rutgers University, Yahoo!-sponsored Machine Learning Seminar Series, Piscataway, NJ, November 2010
- [22] Rutgers University, DIMACS, Interdisciplinary Seminar Series, Piscataway, NJ, October 2010
- [23] Telcorida, Piscataway, NJ, October 2010
- [24] UCLA IPAM, NEH-sponsored Workshop on Networks and Network Analysis for the Humanities, Los Angeles, CA, August 2010
- [25] KDD Workshop on Large-Scale Data Mining: Theory and Applications, Washington, DC, July 2010
- [26] USA/Canada Mathcamp, June 2010

- [27] Google, Mountain View, CA, March 2010
- [28] University of California at Merced, Electrical Engineering and Computer Science Technical Seminar Series, Merced, CA, December 2009
- [29] Lawrence Berkeley National Laboratory, Data Intensive Systems Group, Berkeley, CA, December 2009
- [30] Rutgers University, DHS Fellows Seminar Series, Piscataway, NJ, September 2009
- [31] Rutgers University, Department of Computer Science, Colloquium Talk, Piscataway, NJ, April 2009
- [32] Indiana University, School of Informatics, Informatics Colloquium, Bloomington, IN, February 2009
- [33] University of Rochester, Computer Science Department, Department Seminar Series, Rochester, NY, December 2008
- [34] University of Wisconsin-Madison, Computer Sciences Department, AI Seminar, Madison, WI, September 2008
- [35] Yahoo!, Santa Clara, CA, August 2008
- [36] 2008 SIAM Annual Meeting, Mini-symposium on Toward Real-Time Analysis of Networks, San Diego, CA, July 2008
- [37] University of Southern California, Information Sciences Institute, AI Seminar, Marina del Ray, CA, December 2007
- [38] UCLA IPAM, Program on Mathematics of Knowledge and Search Engines, Workshop III: Social Data Mining and Knowledge Building, Los Angeles, CA, November 2007
- [39] 15th Bay Area Discrete Math Day (BADMath Day XV), Googleplex, Mountain View, CA, October 2007
- [40] UCLA IPAM, Workshop on NSF Cyber-Enabled Discovery and Innovation Program: Knowledge Extraction, Los Angeles, CA, October 2007
- [41] UCLA IPAM, Program on Mathematics of Knowledge and Search Engines, Workshop I: Dynamic Searches and Knowledge Building, Los Angeles, CA, October 2007
- [42] Rutgers University, DIMACS/DyDAn Workshop on Computational Methods for Dynamic Interaction Networks, Piscataway, NJ, September 2007
- [43] Army Research Office (ARO) Workshop on Abductive Reasoning, College Park, MD, August 2007
- [44] University of Maryland, College Park, Department of Computer Science, LINQS Seminar, College Park, MD, August 2007
- [45] University of Illinois at Urbana-Champaign, Multimodal Information Access and Synthesis Center (MIAS), Data Sciences Summer Institute, Urbana-Champaign, IL, July 2007
- [46] Carnegie Mellon University, Database Seminar, Pittsburgh, PA, June 2007
- [47] Rutgers University, Institute for Discrete Sciences Workshop on Associating Semantics with Graphs, Piscataway, NJ, April 2007
- [48] Rutgers University, Center for Dynamic Data Analysis, DyDan Homeland Security Seminar, Piscataway, NJ, March 2007
- [49] San Jose State University, Department of Mathematics, Colloquium Series, San Jose, CA, March 2007
- [50] University of California at Davis, Center for Computational Science and Engineering, Complex Systems Seminar, Davis, CA, November 2006
- [51] SRI International, Artificial Intelligence Center, Menlo Park, CA, November 2006
- [52] Siemens Medical, Malvern, PA, August 2006
- [53] University of San Francisco, Department of Computer Science, San Francisco, CA, November 2005
- [54] Los Alamos National Laboratory, ADVISE Machine Learning Workshop, Los Alamos, CA, August 2005
- [55] UCLA IPAM, Graduate Summer School on Intelligent Extraction of Information from Graphs and High-dimensional Data, July 2005
- [56] University of Texas at Austin, Department of Computer Sciences, Forum for Artificial Intelligence, Austin, TX, November 2004
- [57] SRI International, Artificial Intelligence Center, Menlo Park, CA, October 2004
- [58] University of California at Davis, Department of Computer Science, Computer Science Colloquium, Davis, CA, November 2003
- [59] Lawrence Livermore National Laboratory, Institute for Scientific Computing Research, Summer Lecture Series, Livermore, CA, July 2003

- [60] Stanford University, Center for the Study of Language and Information (CSLI), Seminar on Computational Learning and Adaptation, Stanford, CA, March 2003
- [61] California Institute of Technology, Computer Science Department, Pasadena, CA, January 2002
- [62] Research, Careers, and Computer Science: A Maryland Symposium, College Park, MD, November 2001
- [63] Lawrence Livermore National Laboratory, Livermore, CA, March 2001
- [64] IBM Watson Research Center, Yorktown, NY, March 2001
- [65] RAND Corporation, Santa Monica, CA, February 2001
- [66] MIT Lincoln Lab, Lexington, MA, February 2001
- [67] University of New Mexico, Department of Computer Science, Albuquerque, NM, April 2000

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## Teaching Experience & Tutorials

- Teaching at Rutgers University
  - Spring 2012: Machine Learning (#536, 3 credits, graduate course)
  - Fall 2011: Topics in Computer Science: Introduction to Network Science (#442, 4 credits, undergraduate course)
  - Spring 2011: Seminar in Computer Science: Graph Mining and Network Analysis (#672, 3 credits, graduate course)
  - Spring 2011: (Graduate) Light Seminar on Machine Learning (#500, 1 credit, graduate course)
- Tutorials
  - 2012 SIAM International Conference on Data Mining (SDM'12): Discovering Roles and Anomalies in Graphs: Theory and Applications (with Christos Faloutsos), Anaheim, CA, April 2012

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## Advising & Mentoring

- Postdoctoral Scholars
  - Michele Berlingerio (Postdoctoral Researcher, Rutgers University), July & August 2011
    - Topic: Network Similarity
  - Senjuti Basu Roy (Postdoctoral Researcher, Rutgers University), May 2011-May 2012
    - Topic: Role Discovery in Networks
- Graduate Students
  - Chaolun Xia (Graduate Assistant, Rutgers University), Fall 2011
    - Topic: Fake-Review Detection
  - Long Le (Graduate Assistant, Rutgers University), Fall 2011
    - Topic: Botnet Detection through Social Network Analysis
  - Matthew Muscari (Graduate Assistant, Rutgers University), Summer 2011, Fall 2011
    - Topic: Constrained Role Discovery on Large Graphs
  - Chetan Tonde (Graduate Assistant, Rutgers University), Summer 2011, Fall 2011
    - Topic: A Sparse User-Content Interaction Model for Recommendation
  - Priya Govindan (Graduate Assistant, Rutgers University), Spring 2011, Fall 2011
    - Topic 1: Utility-based Link Prediction
    - Topic 2: Re-identification in Graphs
  - Mangesh Gupte (Graduate Assistant, Rutgers University), Summer 2011
    - Topic: Tie-Strength Measurement from Bipartite Affiliation Networks
  - Nishchal Devanur (Graduate Assistant, Rutgers University), Spring 2011
    - Topic: Discrepancy Detection in Twitter Data
  - Marios Iliofotou (Intern, University of California Riverside), Fall 2009
    - Topic: Traffic Classification in Network Data

- Brian Thompson (DHS Fellow, Rutgers University), Summer 2009, Summer 2010
  - o Topic: Discovery and Analysis of Patterns and Anomalies in Volatile Time-Evolving Networks
- Kurt T. Miller (Lawrence Scholar, University of California, Berkeley), August 2008 to May 2010
  - o Topic: Scalable Nonparametric Bayesian Methods for Temporal-Relational Data
- Aria Haghighi (DHS Fellow, University of California, Berkeley), Summer 2007
  - o Topic: Link Prediction in Communication Networks
- Tom Ouyang (DHS Fellow, MIT), Summer 2007
  - o Topic: Link Prediction in Communication Networks
- Christopher L. Baker (DHS Fellow, MIT), Summer 2006
  - o Topic: Probabilistic Models of Human Activity
- David L. Roberts (DHS Fellow, Georgia Tech), Summer 2006
  - o Topic: Value of Information in Evidence Detection
- Undergraduate Students
  - Mita Joshi (Honors Undergraduate Mentee, Rutgers University), Academic Year 2011-12
  - Cristina Ruiz (Advisee, Yale University), Academic Year 2011-12
    - o Topic: Exploring Positive Emotion Contagion Online
  - Florentina Ferati (Texas Lutheran University) and Jack Murtagh (Tufts), NSF-sponsored Research Experience for Undergraduates (REU), Rutgers University, Summer 2011
    - o Topic: Visual Mining of Communities in Complex Networks: Bringing Humans Into the Loop
  - Hilal Genc (Independent Study, Rutgers University), Spring 2011
    - o Topic: Flu Trends in Twitter Messages
  - Marcelo Alvisio (MIT), Christine Kim (Bryn Mawr), Vyacheslav Kungurtsev (Duke), and Cory Nathe (Augsburg), UCLA IPAM Research in Industrial Partnership Program, Summer 2006
    - o Topic: The Disambiguation Problem

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## Professional Activities

- Affiliated faculty
  - Rutgers Center for Information Assurance (RCIA), Rutgers University, Piscataway, NJ, 10/2011 to present
  - Center for Computational Biomedicine, Imaging and Modeling (CBIM), Rutgers University, Piscataway, NJ, 9/2010 to present
  - Rutgers Center for Cognitive Science (RuCCS), Rutgers University, Piscataway, NJ, 9/2010 to present
  - Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers University, Piscataway, NJ, 9/2010 to present
- Action Editor, Data Mining and Knowledge Discovery ([DMKD](#)), Springer, September 2009 to present
- Journal Referee
  - Data Mining and Knowledge Discovery ([DMKD](#))
  - ACM Transactions on Knowledge Discovery from Data ([TKDD](#))
  - Machine Learning Journal ([MLJ](#))
  - Journal of Machine Learning Research ([JMLR](#))
  - Knowledge and Information Systems ([KAIS](#))
  - SIAM Journal on Optimization
  - IEEE Transactions on Systems, Man, and Cybernetics Part C: Applications & Reviews
  - Journal of Applied Logic
  - Journal of Information Science and Engineering
  - International Journal of Computers and their Applications, Special Issue on Intelligent Agents

- Conference, Symposium, and Workshop Program Committees
  - National Conference on Artificial Intelligence (AAAI): 2006, 2007, 2008, 2012
  - ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD): 2004, 2005, 2007, 2010, 2011, 2012
  - IEEE International Conference on Data Mining (ICDM): 2003, 2004, 2006, 2007, 2008, 2009, 2010 (Vice PC Chair), 2011
  - International Conference on Machine Learning (ICML): 2008, 2009, 2010, 2011
  - International World Wide Web Conference (WWW): 2006 (Data Mining Track), 2012 (Social Network Track)
  - Neural Information Processing Systems (NIPS): 2011 (Reviewer)
  - European Conference on Machine Learning (ECML) / European Conference on Principles and Practice of Knowledge Discovery in Databases (PKDD): 2006, 2007, 2008, 2011, 2012 (Area Chair)
  - Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD): 2007, 2009, 2010
  - SIAM International Conference on Data Mining (SDM): 2008, 2011, 2012
  - NIPS Workshop on Machine Learning for Social Computing: 2010
  - International Workshop on Mining and Learning with Graphs (MLG): 2010, 2011
  - ACM Symposium for Applied Computing (SAC): 2006, 2007, 2008
  - IEEE International Conference on Social Computing (SocialCom): 2009
  - International Conference on Web Information Systems Engineering (WISE): 2005
  - IADIS International Conference on WWW/Internet: 2004, 2005
  - ACM SIGKDD Workshop on Large-scale Data Mining: Theory and Applications (LDMTA): 2011
  - ACM SIGKDD Workshop on Social Network Mining and Analysis (SNA-KDD): 2007, 2008, 2009, 2010, 2011
  - ACM SIGKDD Workshop on Social Media Analytics (SoMA): 2010
  - CIKM Workshop on Complex Networks in Information & Knowledge Management (CNIKM): 2009
  - IEEE ICDM Workshop on Analysis of Dynamic Networks (ICDM-ADN): 2008
  - IEEE ICDM Workshop on Mining Graphs and Complex Structures (MGCS): 2007
  - IJCAI Workshop on Link Analysis in Heterogeneous Information Networks: 2011
  - ECML/PKDD Workshop on Finding Patterns of Human Behaviors in Network and Mobility Data (NEMO): 2011
  - SIAM SDM Workshop Analysis of Dynamic Networks (SDM-ADN): 2009
  - AAAI Fall Symposium on Capturing and Using Patterns for Evidence Detection: 2006
  - IEEE GlobeCom Workshop on Future User Centric Experiences: 2010
  - IEEE International Conference on Data Mining (ICDM), PhD Forum: 2011
  - Workshop on Parallel and Distributed Computing for Machine Learning and Inference Problems (ParLearning), in conjunction with the IEEE International Parallel & Distributed Symposium (IPDPS): 2012
- Organizing Committees
  - UCLA IPAM, Long Program on “Mathematics of Social Systems,” Spring 2014
  - IEEE ICDM’11 Workshop on Data Mining Technologies for Computational Collective Intelligence (DMCCI), December 2011
  - NSF-sponsored Workshop on “Algorithms in the Field,” May 2011
  - Yahoo!-Rutgers Machine Learning Seminar, Academic Year 2010-11
  - Tutorial Co-chair, The 16<sup>th</sup> ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2010
  - UCLA IPAM, Program on “Networks and Network Analysis for the Humanities: An NEH Institute for Advanced Topics in Digital Humanities,” 2010
  - SIAM Conference on Computational Science and Engineering (CSE), 2009
  - Chair, Mini-symposium on “Toward Real-Time Analysis of Networks,” *SIAM Annual Meeting (AN)*, 2008
  - Co-chair, New Investigators Track, The Grace Hopper Celebration for Women in Computing, 2007

- Proceedings Chair, The 12<sup>th</sup> ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2006
- Institute for Terascale Simulation (ITS) Lecture Series (sponsored by NNSA's Advanced Simulation and Computing Program), 2006, 2007, 2008, 2009
- UCLA IPAM, Graduate Summer School on *Intelligent Extraction of Information from Graphs and High-dimensional Data*, Summer 2005
- DHS, Data Sciences Workshop, Fall 2004
- Grant Proposal Panel Member and Reviewer
  - Air Force Office of Scientific Research (AFOSR), Fall 2007 and Summer 2009
  - NSF Review Panels, Spring 2003, Winter 2005, Spring 2005, Fall 2007, Spring 2008
  - NSF CISE Ad-hoc Reviewer, Fall 2007, Spring 2008, and Fall 2008
  - DOE/NNSA Proliferation Detection Program, 2006 and 2007
  - ONR/DHS Institute for Discrete Sciences, University Affiliate Centers, 2006
  - Lawrence Livermore National Laboratory, University Collaborative Research Program, 2003
- Academic Committees
  - Admissions Committees, Department of Computer Science, Rutgers University, 2011-12
  - Faculty Mentor for the School of Arts and Sciences Honors Program, Rutgers University, 2011-12
  - Rutgers Day Committee, Department of Computer Science, Rutgers University, 2011-12
  - Doctoral Defense committee, Department of Computer Science, Rutgers University
    - o Shaoting Zhang (Fall 2011), Junzhou Huang (Spring 2011)
  - Pre-defense committee, Department of Computer Science, Rutgers University
    - o Nicholas Michael (Summer 2011), Shaoting Zhang (Spring 2011)
  - Qualifying committee, Department of Computer Science, Rutgers University
    - o Gayatree Ganu (Fall 2011), Fei Yang (Fall 2011), Vukosi Marivate (Fall 2011), Xinyi Cui (Spring 2011), Josef Wegehaupt (Spring 2011)
  - Admissions Committees, Department of Computer Science, Rutgers University, 2010-11
  - PhD committee, Department of Computer Science, University of California, Davis
    - o Zeqian Shen (Fall 2009): "Visual Analysis of Complex Networks"
  - Masters committee, Department of Computer Science, University of California, Davis
    - o Jonathan McPherson (Summer 2004): "Visualization and Interaction Techniques for Large Hierarchies and Graphs"
  - Admissions Committee, Computer Sciences Department, Univ. of Wisconsin-Madison, 1998-99
- Miscellaneous
  - Invited participant at the DTRA Workshop on AI and Autonomous Systems, October 2011
  - Invited participant at the 7<sup>th</sup> Annual Google Faculty Summit, July 2011
  - Member of DOE Workshop for Cyber Security Research Needs for Open Science, Summer 2007
    - o Lead author of Monitoring and Detection's Priority Research Direction on *Verification of Intended Use*
  - Referee for *the 22nd National Conference on Artificial Intelligence (AAAI)*, Member Abstracts, 2006
  - Referee for *New Generation of Data Mining Applications*, Wiley Publishers, Fall 2003
  - Referee for *the 18th National Conference on Artificial Intelligence (AAAI)*, Student Abstract and Poster Program, 2002

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## Outreach Activities

- Breakfast at the Barracks, Rutgers iTV Studio, November 2011
- Panel Member, CRA-W's Career Mentoring Workshop at IJCAI'09, July 2009
- Organizer, LLNL Graph Analysis Working Group, Fall 2005 and Spring 2006
- Member, MIT Recruiting Team for LLNL Computation Directorate, 2005-06 and 2006-07

- Panel Member, CRA-W Career Mentoring Workshop, Spring 2005
- Panel Member, Grace Hopper Celebration of Women in Computing Conference, Fall 2004

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### **Professional Societies**

- Association for Advancement of Artificial Intelligence (AAAI)
- Association for Computing Machinery (ACM)
- Institute of Electrical and Electronics Engineers (IEEE)
- Society for Industrial and Applied Mathematics (SIAM)

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### **References**

Available upon request.