# CURRICULUM VITAE ANUPAM JOSHI

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#### **Education**:

Ph.D., Computer Science	1993	Purdue University
M.S., Computer Science	1991	Purdue University
B.Tech., Electrical Engineering	1989	Indian Institute of Technology, Delhi

# **Experience in Higher Education:**

2015 - date 2012 - date 2012 - date 2019 - date 2018 - date 2011 - date 2005 - date	Chair, CSEE Department Director, Cyberscholars Program Director, UMBC Center for Cybersecurity Affiliate Professor, Diagnostic Radiology, University of Maryland Affiliate Professor, Department of Medicine, University of Maryland Oros Family Professor University of Maryland, Baltimore County, Professor (tenured), Comp. Sc. Elec. Eng. On sabbatical in AY 14-15, Visiting Prof at IIT Delhi and IIIT-Delhi On partial leave AY 08-09, AY 09-10 at IBM IRL
2001 – 2005	On sabbatical in AY 05-06, spent partly at IBM IRL, IIT-B University of Maryland, Baltimore County, Assas Professor (topused), Comp. Sc. Flor. Fng.
1998 - 2001	Assoc. Professor (tenured), Comp. Sc. Elec. Eng. University of Maryland, Baltimore County, Asst. Professor, Comp. Sc. Elec. Eng.
2000 - 2003	UMIACS, Joint Appointment
1996 - 1998	University of Missouri, Asst. Professor, Comp. Eng. Comp. Sc.
1993 - 1996	Purdue University, Visiting Asst. Professor, Computer Sciences
1992 - 1993	Purdue University, Teaching Assistant, Computer Sciences
1991 – 1992 1989 – 1991	Purdue University, David Ross (PRF) Fellow, Computer Sciences Purdue University, Teaching Assistant, Computer Sciences

## **Experience in Other than Higher Education:**

Oct14 - Sep 2019	Co Technical Director, NCCoE FFRDC, NIST
Sep08 - Aug 10	Visiting Scientist at IBM India Research Labs
Nov 05-Mar 06	Sabbatical visitor at IBM India Research Labs
1988 - 1988	IDM Ltd., Bombay, Summer Intern (R&D Division)

#### **Research Interests**

- Pervasive, Mobile, Sensor and Networked Computing
  - o Information and Data Management, Security, Networking
  - o Context Awareness, especially in Healthcare Delivery and Security

- AI and Security
- Policies, Security, Trust, and Privacy in Open Distributed systems
- Prescriptive/Predictive Analytics and Semantic Web
  - o Social Media, Healthcare, and Cybersecurity related data
- Distributed AI (MultiAgent systems), Neuro-Fuzzy Systems, Learning and Adaptation, HPCC

# **Research Support:**

2020-2021	ST: SCC-PG: Bridging the Digital Gap and Identifying Cross-Cultural Pathways for Adoption of IoT Technologies to Support Super-Aging Societies in the U.S. and Japan, \$75K, NSF, PI
2019-2022	HDR DSC: Collaborative Research: Creating and Integrating Data Science Corps to Improve the Quality of Life in Urban Areas, \$614K, NSF, CoPI.
2019-2022	MRI: Acquisition of a Heterogeneous GPU Cluster to Facilitate Deep Learning Research at UMBC, \$300K, NSF, Senior Personnel.
2019-2020	A Peer-led Team Learning Framework for Ethics in Computing, \$149K, Mozilla Foundation. CoPI.
2019-2020	Integrated Cyber&Physical Security for Smart Homes, \$100K, Maryland Industrial Parnerships (MIPS), PI.
2018-2020	EAGER:X+CS Pathways for non CS majors, \$299K, NSF, PI.
2018-2020	Attribute Based Access Control for the Internet of Things, \$119K, NIST, PI
2018-2019	Cognitive Cybersecurity, \$150K, DoD (via BAH), PI.
2018-2021	Autonomic Cyber-Physical Systems: Resilience to Cyber Attacks, \$195K, ONR, CoPI.
2016-2019	Accelerated Cognitive Cybersecurity Lab, \$1M, IBM, PI.
2016-2017	Beyond Watson support for ALDA project, \$120K, NSF (supplement to NSF I/UCRC from NSA), CoPI on supplement.
2016-2017	Building New Undergraduate Cyber Career Pathways for Students, \$10K, ONR through BHEF, PI.
2016-2019	STO5 Technical Integrator Task Order, \$166K, NIST through MITRE, PI.
2016-2016	STO7 Healthcare Task Order, \$68K, NIST through MITRE, PI.
2015-2018	Anomaly Detection in Cyber-physical Systems: Resilience by Degree of Awareness, \$173,360, ONR, CoPI (Ryan Robucci PI)
2015-2016	STO2 Basic Research Task Order, \$25K, MITRE, PI
2015-2017	Beyond Watson Research Support, \$376K, NSF (supplement to NSF I/UCRC from NSA), PI on supplement (M. Halem PI on main award)
2013-2014	Beyond Watson, \$140,535, NSF (supplement to NSF I/UCRC from NSA), PI on supplement (M. Halem PI on main award)
2012-2016	T2K: From Tables to Knowledge, \$200K, NSF, PI
2012-2016	Policy Compliant Integration of Linked Data, \$400K, NSF, CoPI (Tim Finin, PI)
2012-2014	Social Media Analytics, \$80K, NSF I/UCRC/ Northrop Grumman, PI
2011-2012	Situational Awareness for Threat/Vulnerability Detection, \$40K, Northrop Grumman, PI
2010-2013	Application of Multicore Processing to Advance Personalized Medicine, Software Assurance, and Health IT, \$396K, NIST, CoPI (Yelena Yesha, PI)

2009-2012	Platys: From Position to Place, \$700K, NSF, CO-PI (Tim Finin, PI). Collaborative grant with NCSU and Duke who got separate awards.
2009-2013	Generating Semantic Metadata from Biomedical Images, \$500K, NIST, CoPI (Yelena Yesha,PI)
2009-2010	Inferring the semantics of structured and unstructured data, \$100K,
2009-2011	Microsoft External Research, CoPI (Tim Finin, PI).  Understanding RSM: Relief Social Media, \$270K, Office of Naval
	Research (via subcontract from Lockheed Martin), CoPI (Tim Finin, PI)
2008-2010	Policy-based WAN Configuration and Management, \$224K, DARPA (Phase II STTR with Shared Spectrum Company), PI.
2008-2013	A Framework for Managing the Assured Information Sharing Lifecycle,
	Multi-disciplinary University Research Initiative (MURI), \$7.5M, AFOSR, CoPI (Tim Finin PI). UMBC is the lead institution. The amount
	is the total across all institutions with options. The UMBC share is
	about 25%
2008-2009	Modeling influence, bias and information flow in Social Media, \$60K, Google, CoPI (Tim Finin, PI)
2008-2009	Modeling bias, influence and information flow in social media, \$55K,
2007-2008	Microsoft Research, CoPI (Tim Finin, PI) CT-T: Collaborative Research: A Semantic Framework for Policy
2007-2006	Specification and Enforcement in a Need to Share Environment,
	\$50,000, National Science Foundation, CoPI (Tim Finin PI) (separate
	funding to UTD and UTSA for joint work)
2007-2009	MC2 (Muticore Computational Center), \$***, *** (exact amount
	confidential), IBM, CoPI (M. Halem PI).
2007	Database security in Ad-Hoc Networks, \$40K, Agnik LLC (STTR Phase
2007	1 from DoD), PI
2007	SPINTEL:Information Quality for the Intelligence Analysis,
	\$40K, Lockheed Martin, CoPI (Tim Finin, PI).
2007-2008	Context Aware Surgical Training, \$168K, University of Maryland
2006 2007	Medical System, coPI (Tim Finin, PI).
2006-2007	PWAN – Policy Driven Adaptive Networks, \$40K, CoPI
2006	SharedSpectrum, Inc., STTR Phase 1 from DARPA Faculty Award, \$20,000, PI, IBM
2005-2007	Automatically creating an Electronic Medical Encounter Record,
2003 2007	\$200000, University of Maryland Medical System (DARPA
	Traumapod subcontract), co PI
2004	Shared University Research Grant, \$88,000 (approx), CoPI (M.
	Halem, PI), IBM.
2003-2008	ITR-SemDis: Discovering Complex Relationships in Semantic Web, \$453,417, National Science Foundation, P.I.
2003-2008	ITR: Science on the Semantic Web: Prototypes in Bioinformatics,
	\$2,350,000, National Science Foundation, Co-PI (T. Finin, PI. Other
	CoPIs from UMCP, UCSD, UCSF)
2003-2006	Trust and Security for the Semantic Web, \$240,000, National Science
2002	Foundation, CoPI (T. Finin, PI)
2003	Equipment Grant, \$125,000 (approx), CoPI (Y. Yesha, PI), Cisco Systems
2003	Shared University Research Grant, \$250,000 (approx), CoPI (Y.
	Yesha, PI), IBM.
2002-2005	Subcontract for Security in Pervasive Computing, \$73,596, BAH/NIST,
	P.I.

2003-2004	An Eclipse IDE for Security, Trust and Privacy Policies, IBM, \$40,000, P.I.
2002-2003	UPP Award, \$52,000, IBM
2002	Research Support for Pervasive Computing, \$15,000, Fujitsu Labs of America, P.I.
2002-2005	Profile Driven Architecture for Data Management in Pervasive Environments, \$153,190, National Science Foundation, P.I.
2002-2005	Agent Oriented Approaches to a Ubiquitous Grid, \$480,726, National Science Foundation, P.I.
2002	Support for Organizing the 2002 IDM PIs Meeting, \$224,905, National Science Foundation, Co-PI
2001	A Simulator to evaluate/prototype Local Area and Personal Area Wireless Network protocols and products, \$79,800, AetherSystems Inc, Co-PI (D. Phatak, PI)
2000	Disconnected Web Browsing, \$69,332, AetherSystems Inc, P.I.
2000	Home Automation Service Discovery, \$132,720, AetherSystens Inc, Co-PI (T. Finin, PI)
2000-2004	Dynamic Negotiation Agents in Mobile Computing, \$174,000, National Science Foundation, P.I.
2000-2005	DAML Program, \$1,742,524, DARPA, Co-PI (T. Finin PI, Two other CoPIs from JHU-APL and MIT).
2000	An Expertise Recommender using Web Mining, \$58,089, NASA/USRA, P.I.
2000	Data Analysis for Intrusion Detection, \$15,000, Department of Defence, Co-PI. (C. Nicholas, PI)
1999-2004	CAREER: MultiAgent Systems to Support Mobile Information Access, \$213,952, National Science Foundation, P.I.
July 1999	Summer Fellowship, UMBC Graduate School, \$2500,
1998-2002	Web Mining and Personalization Using Robust Fuzzy Clustering,
	\$163,713, National Science Foundation, PI (Separate Collaborative
	award to colleague at Colorado School of Mines)
1998-99	ILI: Distributed Systems Lab, \$91,960 (\$41,460 from NSF, \$50,000 match), National Science Foundation, P.I.
1997-1999	Ubiquitous Computing to Support Humanitarian Demining, \$30,815, Research Board - University of Missouri, P.I.
	(This award was transferred to H. Shi at my request when I left the University of Missouri )
1997-1999	UPP Faculty Development Award - Intelligent Agent Proxies to support
1997-1999	Mobile Computing, \$80,000 + Equipment, IBM Corporation, P.I.
1998-1999	A vBNS Connection for the University of Missouri-Columbia,
	\$350,000(NSF) + \$600,000 (Cost Share), National Science
	Foundation, Faculty Associate,
1997	Faculty International Travel Award, \$600, University of Missouri
1995	Unrestricted grant to support research in Mobile Computing, \$10,000, Intel Corporation, Co-PI.
1995	SciencePad Project, \$90,000, Intel Corporation, Co-PI.
1995	Equipment award of for "Purdue-on-Line", over \$150,000, IBM Corporation, co-PI
1994-1996	NSF (CISE) Research Associate Award given to E. N. Houstis to
	support my work in ubiquitous, intelligent scientific computing, \$46,200, National Science Foundation
1994	Special Purpose Grants in Science and Engineering - Classroom of the
1001	future project, \$22,000, AT&T Foundation, Co-PI

#### **Research Support for Students**

NSF Graduate Fellowship for Patricia Ordonez, 2007-2010
IBM Fellowship from Toronto CAS for Dipanjan Chakraborty, \$78,000, 2001-2003
Provost's UGRA Award for Amina Mahmood, \$1500, 2020-2021
Provost's UGRA Award for Mohammed Khalid, \$1500, 2020-2021
Provost's UGRA Award for Morgan Madiera, \$1500, 2011-2012.
Provost's UGRA Award for Ramya Ramakrishnan, \$1500, 2001-2002.

#### **Patents**

- 1. *US9,558,267*, Real Time Data Mining, Koustuv Dasgupta, Nilanjan Banerjee, Dipanjan Chakraborty, Sumit Mittal, Seema Nagar, *Anupam Joshi*, Angshu Rai
- 2. US9,378,349, Enabling Secure Transactions between spoken web sites, Anupam Joshi
- 3. US9,223,953, Enabling Secure Transactions between spoken web sites, Anupam Joshi
- 4. *US8,898,163,* Real Time Information Mining, Nilanjan Banerjee, Dipanjan Chakraborty, *Anupam Joshi*, Sumit Mittal, Seema Nagar, Angshu Rai, Koustuv Dasgupta
- 5. *US8,825,661*, Systems and methods for two stream indexing of audio content, *Anupam Joshi*, Sougata Mukherjea, Nitendra Rajput
- 6. *US8,539,561*, Systems and methods to control device endpoint behavior using personae and policies, Akhilesh Gupta, *Anupam Joshi*, Gopal Pingali
- 7. *US8,522,023*, Rural services platform, Vikas Agarwal, *Anupam Joshi*, Shalini Kapoor, Sumit Mittal, Sougata Mukherjea
- 8. *US8,447,269*, Systems and methods for joint analytics on user level and network level data of a communications network, *Anupam Joshi*, Ravi Kothari, Ankur Narang
- 9. *US8,463,705*, Systems and methods for transactions on the telecom web, *Anupam Joshi*, Srinivas G Narayana, Aaditeshwar Seth

#### **Publications:**

These may be slightly dated. For an up-to-date list, see **http://ebiquity.umbc.edu/papers/** Books

- 1. Data Mining: Next Generation Challenges and Future Directions,. (H. Kargupta, A. Joshi, K. Sivakumar, and Y. Yesha, Eds.), AAAI/MIT Press 2004
- 2. Ahmed Elmagarmid, Haitao Jiang, Abdelsalam Helal, Anupam Joshi, Magdy Ahmed, Video Database Systems: Issues, Products and Applications, 1997, Kluwer Academic Publishers.

#### **Book Chapters**

- Sandeep Nair Narayanan, Kush Khanna, Bijaya Ketan Panigrahi, Anupam Joshi, Security in smart cyber-physical systems: a case study on smart grids and smart cars, Smart Cities Cybersecurity and Privacy (D. Rawat and K. Ghafoor, Eds), pp 147-163, https://doi.org/10.1016/B978-0-12-815032-0.00011-1, Elsevier.
- 2. Wenjia Li, Palanivel Andiappan Kodeswaran, Pramod Jagtap, *Anupam Joshi*, and Tim Finin, Managing and Securing Critical Infrastructure A Semantic Policy and Trust Driven Approach, Handbook on Securing Cyber-Physical Critical Infrastructure: Foundations and Challenges, Das, Kant, Zhang (Eds.), Morgan Kaufman, 2012
- 3. Jim Parker, Anand Patwardhan, Filip Perich, *Anupam Joshi*, and Tim Finin, Trust in Pervasive Computing, Mobile Middleware, pp 473-496, CRC Press, February 2006.

- 4. Filip Perich, *Anupam Joshi*, and Rada Chirkova, Data Management for Mobile Ad-Hoc Networks, Enabling Technologies for Wireless e-Business Applications, W Kou, and Yelena Yesha (Eds), Springer, July 2005
- 5. Harry Chen, Tim Finin, and **Anupam Joshi**, The SOUPA Ontology for Pervasive Computing, Ontologies for Agents: Theory and Experiences, Valentina Tamma, Stephen Cranefield, and Tim Finin (Eds), Springer, July 2005
- 6. Jeffery Undercoffer and **Anupam Joshi**, On Data Mining, Semantics, and Intrusion Detection: What to dig for and Where to find it, in Data Mining: Next Generation Challenges and Future Directions,. (H. Kargupta, A. Joshi, K. Sivakumar, and Y. Yesha, Eds.), pp. 437-460, AAAI/MIT Press 2004
- 7. Sasi Avancha, Jeffrey Undercoffer, *Anupam Joshi* and John Pinkston, Security for Sensor Networks, in *Wireless Sensor Networks*, C. S. Raghavendra, Krishna M. Sivalingam and Taieb Znati (Eds), Kluwer Academic Publishers, May 2004,
- 8. Lalana Kagal, James Parker, Harry Chen, *Anupam Joshi*, and Tim Finin, Security, Trust and Privacy in Mobile Computing Environments, in *Handbook of Mobile Computing*, Imad Mahgoub and Mohammad Ilyas (eds.), CRC Press, 2004,
- 9. Sasikanth Avancha, Dipanjan Chakraborty, Filip Perich, and **Anupam Joshi**, Data and Services for Mobile Computing, in *Handbook of Internet Computing*, Munindar Singh(Ed.), pp 36.1 36.16, CRC Press, 2004
- 10. Anupam Joshi, Tim Finin, and Yelena Yesha, Me--Services, A Framework for Secure and Personalized Discovery, Composition and Management of Services in a Pervasive Environment, in Web Services, E-Business and the Semantic Web (LNCS 2512), C. Bussler, R. Hull, S. McIliraith, M.E. Orlowska, B. Pernici, J. Yang (Editors), Springer Verlag, 2002, pp. 248-259. (note: Extended version of a paper presented at WES Workshop, CAiSE 2002)
- 11. **Anupam Joshi**, Z. Jiang, Retriever: Improving Web Search Engine Results Using Clustering, in *Managing Business with Electronic Commerce: Issues and Trends,* (A. Gangopadhyay, Editor), Idea Press, 2001.
- 12. **Anupam Joshi**, N. Ramakrishnan, E. N. Houstis, MultiAgent Recommender Systems in Networked Scientific Computing, in *Enabling Technologies for Computational Science Frameworks, Middleware and Environments*, Kluwer Academic, 2000.
- 13. E. Houstis, J.R. Rice, N.Ramakrishnan, T. Drashansky, S.Weerawarana, *Anupam Joshi*, and C. Houstis, Multidisciplinary Problem Solving Environments for Computational Science, in *Advances in Computers* (M. Zelkovitz, Ed) vol 46, pp 402-438, New York, Academic Press, 1998.

#### <u>Journals</u>

- **1.** Donald Norris, Laura Mateczun, **Anupam Joshi** and Tim Finin, Managing Cybersecurity at the Grassroots: Evidence from the First Nationwide Survey of Local Government Cybersecurity, **Journal of Urban Affairs**, **Routledge**, to appear, 2020.
- **2.** Alejandra Diaz, Alan T Sherman, *Anupam Joshi*, Phishing in an academic community: A study of user susceptibility and behavior, *Cryptologia*, **44**:1, pp 53-67, 2020
- **3.** Kush Khanna, Bijaya Ketan Panigrahi, *Anupam Joshi*, Priority-Based Protection Against the Malicious Data Injection Attacks on State Estimation, *IEEE Systems Journal*, **14:**2 pp. 1945-1952, June 2020, doi: 10.1109/JSYST.2019.2933023.
- **4.** S.K. Singh, R. Bose, *Anupam Joshi*, Energy Theft Detection for AMI using Principal Component Analysis based Reconstructed Data, *IET Cyber-Physical Systems: Theory & Applications*, **4:**2, 2019.
- **5.** Donald Norris, Laura Mateczun, *Anupam Joshi*, and Tim Finin, Cybersecurity at the Grassroots: American Local Government and The Challenges of Internet Security, *Journal*

- of Homeland Security and Emergency Management, accepted for publication, DOI: https://doi.org/10.1515/jhsem-2017-0048
- **6.** Donald Norris, Laura Mateczun, **Anupam Joshi** and Tim Finin, Cyberattacks at the Grass Roots: American Local Governments and the Need for High Levels of Cybersecurity, *Public Administration Review*, **79**:6, pp 805-904, 2019.
- **7.** K. Chopra, R. Bose and *Anupam Joshi*, Stackelberg Game for Price and Power Control in Secure Cooperative Relay Network, *IET Cyber Physical System*, **4**:1, pp 58-67 2019
- **8.** S.K. Singh, Kush Khanna, R. Bose, B.K. Panigrahi, and *Anupam Joshi*, Joint-Transformation-Based Detection of False Data Injection Attacks in Smart Grid, *IEEE Transactions on Industrial Informatics*, **14**:1, pp 89-97, 2018
- **9.** K. Chopra, R. Bose and *Anupam Joshi*, Secrecy Outage of Threshold-Based Cooperative Relay Network With and Without Direct Links, *Springer EURASIP Journal on Information Security*, 2018
- **10.** S.K. Singh, R. Bose, Anupam Joshi, Entropy-based electricity theft detection in AMI network, *IET Cyber-Physical Systems: Theory & Applications* **3:**2, pp 99-105, 2018
- **11.** Kush Khanna, B.K. Panigrahi, *Anupam Joshi*, AI based approach to identify compromised meters in Data Integrity Attacks on Smart Grid, *IET Generation*, *Transmission and Distribution*, **12**:5, pp 1052-1066.
- **12.** Kush Khanna, B.K. Panigrahi, *Anupam Joshi*, Bi-level modelling of false data injection attacks on security constrained optimal power flow, *IET Generation, Transmission and Distribution*, **11**:14, pp. 3586-3593, 2017
- **13.** K. Chopra, R. Bose and *Anupam Joshi*, Secrecy Performance of Threshold-Based Decode-and-Forward Cooperative Cognitive Radio Network, *IET Communications Journal*, Feb. 2017
- **14.** Kush Khanna, B.K. Panigrahi, *Anupam Joshi*, Data Integrity Attack in Smart Grid: Optimized Attack to Gain Momentary Economic Profit, *IET Generation, Transmission and Distribution*, **10**:16, pp. 4032-4039, 2016, DOI 10.1049/iet-gtd.2016.0350
- **15.** Paridhi Jain, Ponnurangam Kumaraguru, *Anupam Joshi*, Other times, other values: leveraging attribute history to link user profiles across online social networks, *Social Netw. Analys. Mining* **6**:1, 2016 (extended version of HT 15 paper).
- **16.** Randy Schauer, *Anupam Joshi*, Distributed system configuration management using Markov logic networks. *Int. J. Auton. Comp.* **2**:2, pp 137-154 (2016)
- **17.** Jennifer Sleeman, Tim Finin, *Anupam Joshi*, Entity Type Recognition for Heterogeneous Semantic Graphs, *AI Magazine*, **36**:1, pp 75-86.
- **18.** Laura Zavala, Pradeep K. Murukannaiah, Nithyananthan Poosamani, Tim Finin, *Anupam Joshi*, Injong Rhee, and Munindar P. Singh. Platys: From Position to Place-Oriented Mobile Computing, pp. 1-9, *AI Magazine*, v35, n4, Winter, 2014.
- **19.** Aniket Bochare, Aryya Gangopadhyay, Yelena Yesha, *Anupam Joshi*, Yaacov Yesha, Mary Brady, Michael A. Grasso, Naphtali Rishe, Integrating domain knowledge in supervised machine learning to assess the risk of breast cancer, *Intl. J. Med. Eng. Informatics (IJMEI)*, **6**:2, pp 87-99, 2014
- **20.** Wenjia Li, *Anupam Joshi*, Tim Finin, CAST: Context-Aware Security and Trust framework for Mobile Ad-hoc Networks using Policies, *Distributed and Parallel Databases* **31:**2, pp 353-376, 2013, DOI 10.1007/s10619-012-7113-3
- **21.** Lushan Han, Tim Finin, Paul McNamee, *Anupam Joshi*, and Yelena Yesha, Improving Word Similarity by Augmenting PMI with Estimates of Word Polysemy, *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, **25:**6, pp 1307-1322, DOI 10.1109/TKDE.2012.30
- **22.** Palanivel Andiappan Kodeswaran, Sethuram Balaji Kodeswaran, *Anupam Joshi*, and Tim Finin, Enforcing Security in Semantics driven Policy based Networks, *Computer Standards and Interfaces*, **33**:1, pp 2-12, 2011.

- **23.** Wenjia Li, Jim Parker, and *Anupam Joshi*, Security through Collaboration and Trust in MANETs, *J. Mobile Networks and Applications (MONET)*, DOI: 10.1007/s11036-010-0243-9
- **24.** *Anupam Joshi*, Tim Finin, Lalana Kagal, Jim Parker and Anand Patwardhan, Security Policies and Trust in Ubiquitous Computing, *Philosophical Transactions A, The Royal Society of London*, **366**:1881, pp 3769-3780, October 2008.
- **25.** Boanerges Aleman-Meza, Meenakshi Nagarajan, Li Ding, Amit Sheth, Budak Arpinar, **Anupam Joshi**, and Tim Finin, Semantic Analytics on Social Networks: Experiences in Addressing the Problem of Conflict of Interest Detection, *ACM Transactions on the Web*, **2**:1, 2008 (extended version of WWW05 paper).
- **26.** Amit Anil Nanavati, Rahul Singh, Dipanjan Chakraborty, Koustuv Dasgupta, Sougata Mukherjea, Gautam Das, Siva Gurumurthy, **Anupam Joshi**, Analyzing the Structure and Evolution of Massive Telecom Graphs, *IEEE Trans. Knowl. Data Eng.*, 20(5): pp 703-718 (2008)
- **27.** Tim Finin, *Anupam Joshi*, Pranam Kolari, Akshay Java, Anubhav Kale, and Amit Karandikar, The Information ecology of social media and online communities, *AI Magazine*, **29**:3, pp 77-92.
- **28.** Akshay Java, Sergei Nirneburg, Marjorie McShane, Timothy Finin, Jesse English and **Anupam Joshi**, Using a Natural Language Understanding System to Generate Semantic Web Content, *International Journal on Semantic Web and Information Systems*, 3(4), 2007.
- **29.** Anand Patwardhan, Jim Parker, Michaela Iorga, **Anupam Joshi**, Tom Karygianis, and Yelena Yesha, Threshold-based Intrusion Detection in Ad Hoc Networks and Secure AODV, *Ad Hoc Networks Journal (ADHOCNET)*, **6**:4, pp 578-599, 2008.
- **30.** Sheetal Agarwal, *Anupam Joshi*, Tim Finin, Yelena Yesha, and Tim Ganous, A Pervasive Computing System for the Operating Room of the Future, *ACM/Kluwer Journal on Mobile Networking and Applications*, **12**:2-3, pp 215-228, 2007.
- **31.** Lalana Kagal, Tim Finin, *Anupam Joshi*, and Sol Greenspan, Security and Privacy Challenges in Open and Dynamic Environments, *IEEE Computer*, **39**:6, pp 89-91, June 2006
- **32.** Anand Patwardhan, Filip Perich, *Anupam Joshi*, Tim Finin, and Yelena Yesha, Querying in Packs: Trustworthy Data Management in Ad Hoc Networks, *International Journal of Wireless Information Networks*, **13**:4, Oct 2006
- **33.** Dipanjan Chakraborty, *Anupam Joshi*, and Yelena Yesha, Integrating service discovery with routing and session management for ad-hoc networks, *Ad Hoc Networks*, **4**:2, pp 204-224, March 2006.
- **34.** Dipanjan Chakraborty, *Anupam Joshi*, Yelena Yesha, and Tim Finin, Toward Distributed Service Discovery in Pervasive Computing Environments, *IEEE Transactions on Mobile Computing*, **5**:2, pp 97-112, February 2006.
- **35.** Avinash Shenoi, Yelena Yesha, Yaacov Yesha, Anupam Joshi, A Framework for Specification and Performance Evaluation of Service Discovery Protocols In Mobile Ad-Hoc Networks, *Ad Hoc Networks Journal (ADHOCNET)*, **4**:1, 2006.
- **36.** Tim Finin, Li Ding, Lina Zhou, and *Anupam Joshi*, Social Networking on the Semantic Web, The Learning Organization, **12**:5, pp 418-435, December 2005
- **37.** Li Ding, Tim Finin, *Anupam Joshi*, Yun Peng, Rong Pan, and Pavan Reddivari, Search on the Semantic Web, IEEE Computer, **10**:38, pp 62-69, October 2005,
- **38.** Filip Perich, *Anupam Joshi*, Yelena Yesha, and Tim Finin, Collaborative Joins in a Pervasive Computing Environment, VLDB Journal, **14**:2, pp 182-196, April 2005
- **39.** Li Ding, Tim Finin, and *Anupam Joshi*, Analyzing Social Networks on the Semantic Web, IEEE Intelligent Systems, **20**:1, January 2005
- **40.** Dipanjan Chakraborty, *Anupam Joshi*, Tim Finin, and Yelena Yesha, Service Composition for Mobile Environments, ACM/Kluwer Journal on Mobile Networking and Applications, Special Issue on Mobile Services, **10**:4, January 2005

- **41.** Kamdar, T., and *Joshi, Anupam*, Using Incrimental Weblog Mining to Create Adaptive Web Servers, in *Intl. Journal of Digital Libraries*, **5**:2, pp 133-150, 2005.
- **42.** Li Ding, Tim Finin and *Anupam Joshi*, Analyzing Social Networks on the Semantic Web, IEEE Intelligent Systems (Trends and Controversies), 2004 (invited paper).
- **43.** Harry Chen, Tim Finin, *Anupam Joshi*, Filip Perich, Dipanjan Chakraborty, and Lalana Kagal, Intelligent Agents Meet the Semantic Web in Smart Spaces, *IEEE Internet Computing*, **8**:6, November/December, 2004 (Invited Paper)
- **44.** Pranam Kolari and *Anupam Joshi*, Web Mining Research and Practice, *IEEE Computing in Science and Engineering Web Engineering Special Issue*, **6**:4, July/August 2004, pp 49-53.
- **45.** Filip Perich, *Anupam Joshi*, Tim Finin, and Yelena Yesha, On Data Management in Pervasive Computing Environments, *IEEE Transactions on Knowledge and Data Engineering*, **16**(5), pp 621-634, May 2004.
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- **47.** Jeffrey L Undercoffer, *Anupam Joshi*, Tim Finin, John Pinkston, Using DAML+OIL to Classify Intrusive Behaviors, Knowledge Engineering Review, **18**:3, pp 221-241, 2003.
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- 4. Lalana Kagal, Jeffrey Undercoffer, Filip Perich, *Anupam Joshi*, Tim Finin, A Security Architecture Based on Trust Management for Pervasive Computing Systems, *Grace Hopper Celebration of Women in Computing*, 2002.
- 5. Lalana Kagal, Vladimir Korolev, Sasikanth Avancha, *Anupam Joshi*, Timothy Finin, An Approach to Dynamic Service Management in Pervasive Computing, *Grace Hopper Celebration of Women in Computing*, 2002.
- 6. Avancha, S., Chakraborty, D., Chen, H., Kagal, L., Perich, F., Finin, T., Joshi, Anupam, Issues in Data Management for Pervasive Environments, NSF Workshop on Context Aware Mobile Database management (CAMM), January 24-25, 2002
- 7. Lalana Kagal, Filip Perich, Harry Chen, Sovrin Tolia, Youyoung Zou, Tim Finin, Anupam Joshi, Yun Peng, Richard Cost, Charles Nicholas, Agents Making Sense of the Semantic Web, First GSFC/JPL Workshop on Radical Agent Concepts (WRAC), January 2002.
- 8. Harry Chen, Sovrin Tolia, Craig Sayers, Tim Finin, and Anupam Joshi, Creating Context-Aware Software Agents, First GSFC/JPL Workshop on Radical Agent Concepts, January, 2002.

- 9. Dipanjan Chakraborty, Filip Perich, Sasikanth Avancha, and Anupam Joshi, An Agent Discovery Architecture using Ronin and DReggie, First GSFC/JPL Workshop on Radical Agent Concepts, January, 2002.
- 10. Sasikanth Avancha, Dipanjan Chakraborty, Dhiral Gada, Tapan Kamdar, and Anupam Joshi, Fast and effective wireless handoff scheme using forwarding pointers and hierarchical foreign agents, SPIE International Symposium on Convergence of IT and Communications, August 20-24, 2001 (Invited Submission).
- 11. Joshi, Anupam and L. Xu, A Jini based Framework for a Component Recommender System, Proc. 16th IMACS world Congress, Special Session on PSEs for Scientific Computing (invited submission)
- 12. Drashansky, T., Joshi, Anupam, Rice, J.R., "Multidisciplinary Problem Solving using Agents in a Cluster Environment", Cluster Computing Conference 97 (On-Line proceedings at http://www.mathcs.emory.edu/~ccc97/sessions.html).
- 13. Drashansky, T., Joshi, Anupam, Rice, J. R., Houstis, E. N., Weerawarana, W., ``A MultiAgent Environment for MPSE's", (CD-ROM) Proc. 8th SIAM Conf. Parallel Processing for Scientific Computing, 1997.
- 14. Ramakrishnan, N., Joshi, Anupam, Houstis, E.N., Rice, J.R. and Weerawarana, S., `Intelligent Networked Scientific Computing', Proc. 15th IMACS World Congress, 1997.
- 15. Drashansky, T., Joshi, Anupam, Rice, J. R., Houstis, E. N., Weerawarana, S., ``MultiAgent Techniques for Simulation of Complex Scientific Systems'', Proc. 15th IMACS World Congress, 1997.
- 16. Graham, S., Pizlo, Z. and Joshi, Anupam, ``Problem Solving in Human Beings and Computers'', presented at Annual Math. Psych. Meeting, Irvine, 1995.
- 17. Guerra, C, Houstis, E.N. and Joshi, Anupam , ``Reconstruction of rectangles from projections: an application to surface mounted device placement", SPIE Intelligent Robots and Computer Vision XIII, 1994, pp. 145-150.

#### Non-Peer-Reviewed Works.

- 1. Pranam Kolari, Akshay Java, Tim Finin, James Mayfield, *Anupam Joshi*, and Justin Martineau, *Blog Track Open Task: Spam Blog Classification, TREC 2006 Blog Track Notebook*. November 2006
- 2. Tim Finin, Li Ding and **Anupam Joshi**, Information Integration and the Semantic Web, *Notes from the Information Integration Workshop*, October 2006,
- 3. Joshi, Anupam, Weerasinghe, R., Mcdemott, S., Tan, B., Bernhardt, G. and Weerawarana, S., Mowser: Mobile Platforms and Web Browsers', Bulletin of the TCOS, IEEE Computer Society, 1996
- 4. Houstis, E. and Joshi, Anupam, SciencePad: An Environment for the Electronic Classroom and Laboratory, presented at Invited Minisymposium on Electronic Textbooks, Classrooms and Laboratories for Education in Computational Sciences, SIAM Annual meeting 1995

#### Students:

I have served on the committee of several students at both the MS and PhD level. I indicate below only those students whose committees I chaired. I've also been the external examiner for PhD theses from Monash University (Australia), IIT-Delhi (India), IISc (India) and IIT-Guwahati (India).

#### Ph.D.

Sandeep Narayanan, May 2019, Chair
Prajit Das, Aug 2017, Chair
David Mountain, May 2017, Chair (part time student)
Clare Grasso, May 2017, Chair
M. Lisa Matthews, May 2017, Chair (SFS Fellowship)
Randy Schauer, PhD Summer 2014, Chair (part time student)
Wenjia Li, Aug 2011, Chair.
Palanivel Kodeswaran, May 2011, Chair
Sethuram Balaji Kodeswaran, Aug 2008, Chair (part time student)
Jim Parker, Dec 2008, Chair (part time student)
Anand Patwardhan, May 2007, Chair
Sasikanth Avancha, Aug 2005, Chair (MS, December 2001)
Filip Perich, May 2004, Chair
Dipanjan Chakraborty, June 2004, Chair

Vladimir Korolev, PhD Expected 2021, Chair (part time student)

Aritran Piplai, PhD Expected 2023, Chair Sai Sree Laya Chukkapalli Oyesh Mann Singh PhD Expected 2023, Chair PhD Expected 2023, Chair PhD Expected 2024, Chair PhD Expected 2024, Chair

#### Master's

Sandesh Timilsina, May 2020, Chair Sowmya Ramapatruni, May 2019, Chair Aditya Pingle, May 2019, Chair Nitika Khurana, May 2018, Chair Vishal Rathod, Summer 2018, Chair Alejandra Diaz, Summer 2018, Co-Chair Lauren Mazolli, December 2016, Chair Piyush Nimbalkar, Summer 2015, Chair Primal Pappachan, Summer 2014, Chair Morgan Madeira, Summer 2014, Chair Satvaiit Padalkar, Summer 2014, Chair Sandhya Krishnan, Summer 2013, Chair Deepal Shah, Summer 2013, Chair Puneet Sharma, Summer 2013, Chair Dibyajyoti Ghosh, Oct 2012, Chair Sumit More, May 2012, Chair Pramod Jagtap, Summer 2011, Chair Audumbar Chormale, Summer 2009, Chair Kishor Datar, Summer 2009, Chair Sheetal Gupta, Summer 2008, Chair Onkar Valawalkar, Summer 2007, Chair Amit Karandikar, May 2007, Chair Sandor Dornbush, Aug 2007, Chair Nimish Vartak, Summer 2006, Chair Sheetal Agarwal, Summer 2006, Chair Sachee Tripathi, Summer 2005, Chair

Abhishek Gujar, December 2005, Chair G.K. Shashidhara, Summer 2005, Chair Vladimir Korolev, Aug 2004, Chair Pranam Kolari, May 2004, Chair Amit Choudhri, September 2003, Chair Avinash Shenoi, September 2003, Chair Hiren Shah, Aug 2003, Chair Vipul Hingne, May 2003, Chair Kejian Hu, August 2002, Chair Bhagyalakshmi Bethala, August 2002, Chair Sovrin Tolia, August 2002, Chair Dhiraj Bhandari, May 2002, Chair Purnima Chandrashekharan, Aug 2001, Chair Tapan Kamdar, May 2001, Chair Chaitanya Pullela, August 2000, Chair Liang Xu, May 2000, Chair Scott Jiang, May 2000, Chair

The Following Students graduated from the University of Missouri Vineeth Subramanium, Summer 1999, Chair Sunil Tripathy, Feb 1999, Chair Sanjay Mellacheruvu, Feb 1999, Chair Harini Bharadwaj, Summer 1998, Chair Scott Drummond, Summer 1998, Chair Pramod Karnam, Summer 1997, Chair

## **Honors Received:**

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	2018	Test of Time Award for 2008 Paper, EDBT conference
	2018	10 Year Best Paper Award for 2008 paper, ACM SACMAT
	2014	IEEE Fellow
	1999-2003	NSF CAREER Award
	2003 - date	IBM Toronto Center for Advanced Studies Fellow
	1997-1999,	IBM Faculty Award / UPP
	2002-2003,	IBM Faculty Award / UPP
	2006- 2007	IBM Faculty Award / UPP
	1994-1996	NSF Research Associate Award.
		Member, Upsillon Pi Epsilon.
		Member, IEEE, IEEE-CS, ACM. Elected Senior Member of IEEE
		in 2003.
	1984	Prefect, Academics, Modern School (India).
	1983	National Talent Scholarship (India)
	1980	Junior Science Talent Scholarship (India)

#### **Selected Professional services**

I have served on the PC for many conferences, some of which are outlined below. In addition, I routinely review papers for several prominent journals in my field. Recent examples include Trans. Knowledge and Data Engineering, IEEE Trans. Computers, IEEE Trans Mobile Computing, IEEE Computer, IEEE Internet Computing, IEEE Trans. SMC, IEEE Trans. Neural Networks, Comm. ACM, VLDB Journal, ACM/Kluwer MONET, J. Distr. and

Parallel Databases. I have also served as a panelist for NSF on several occasions for different programs such as IIS, EIA and DUE. Due to confidentiality reasons, exact dates and panels cannot be revealed.

2018 IEEE CS Fellows Evaluation Committee 2017 IEEE CS Fellows Evaluation Committee 2015 IEEE CS Fellows Evaluation Committee 2020 - date 2006 - date Editorial Board Member, Communications of the ACM 2006 - date Editorial Board Member International Journal on Semantic Web and			
Information S 1999 – 2003 2003	Associate Editor Guest Editor	IEEE Transactions on Fuzzy Systems VLDB Journal Special issue on the Semantic Web (with Y. Yesha and V. Atluri)	
2002	Guest Editor Special	Journal of Very High Speed Networks	
	Mundur)	Issue on Multimedia Networks (with P.	
2001 Guest	•	al of Very High Speed Networks Special	
		Issue on Broadband Wireless Networks.( with A.	
Jun 1000	Guest Editor	Krishna)	
Jun 1999	Guest Editor	Journal of Distributed and Parallel Databases	
	Management and	Special Issue on Mobile Data	
	aageee	Applications (with J. Jing)	
Mar 1999	Guest Editor	CACM Theme section on MultiAgent systems on	
		the Network (with M. Singh)	
Oct 1998	Guest Editor	IEEE Personal Communications Magazine Special	
		Issue on Mobile Systems and the Web (with A. Krishna)	
2021	General Chair	ACM CODASPY	
2005 -	Steering Committee	IEEE MDM	
2018	General Chair	IEEE MDM	
2015	General Chair	IEEE ISI	
2012	General Chair	IEEE MDM	
2010	PC Chair	IEEE SRDS	
2008	Program Committee	IEEE MDM	
2007	Program Committee		
2006	Program Committee		
2006 2006	Program Committee		
2006	Program Committee Program Committee		
2006	Program Committee	·	
2006	Program Committee		
2005	Program Committee		
2005	Program Committee		
2005	PC Chair	Mobiquitous05	
2005	Organizing Committ	ee Chair ACM SIGMOD	

2005 2005 2005 2004 2004 2004 2004 2004	Program Committee Program Committee Program Committee Local Arrangements Chair Program Committee Panels Co-Chair Co-General Chair Program Committee Cocal Arrangements Chair Program Committee	IEEE ICDE IEEE PERCOM ISWC SWPW Workshop ACM SenSys IEEE SECON Mobiquitous04 IEEE MDM ISWC IEEE ICDE IEEE ICDCS IEEE PERCOM IEEE MDM IEEE MDM IEEE MDM IEEE MDM IEEE MDM IEEE ICDE ISWC ACM CIKM AAMAS Workshop on Ubiquitous Agents on embedded, wearable,
2002 Mobile	Program Committee	and mobile devices, ACM Mobicom Workshop on
2002 2002 2002	Program Committee Program Committee Co-Organizer	Commerce ACM SIGMOD Conference IEEE ICDCS NSF Workshop on Context Aware Mobile Data Management,.
2001 2001 2001 Mobile	Program Committee Program Committee Program Co-Chair	ATAL IPCCC ACM Mobicom Workshop on
2001	Program Committee	Commerce 3rd IEEE Intl. Conf. Mobile and Wireless Communication Networks
2001	Program Committee	Intl. Conf. Parallel and Distributed Systems
2001	Program Committee	2nd International Workshop on Wireless Networks and Mobile Computing (held with IEEE Intl Conf. Distributed Computing Systems),
2001	Program Committee Member	2nd International Conference on Mobile Data Management
2000 2000	Local Arrangements CoChair Tutorial on Mobile E-Commerce	ACM CIKM 2nd ACM SigECOM Conference EC00.
2000 2000	Tutorial: Mobile Data Management Program Co-Chair	
2000 2000	Program Committee Member Co-Organizer	IPCCC. HICSS33 Minitrack on Multi-Agent
1999	Program Committee	systems, Internet, & Applications. Electronic Commerce and Web (EC-WEB) Conference

1999 Electronic,	Co-Organizer, Panel on Mobilit	ty First ACM Conference of
1999 1999 1998	and Electronic Commerce, Program Committee Member Program Committee Member Program Committee Member	Commerce Fifth Annual ACM/IEEE MobiCom WIDM Workshop, ACM CIKM. Fourth Annual ACM/IEEE International Conference on
Mobile		Computing and Networking
1998	Program Committee Member	AAAI 98 Workshop on Software Tools for Developing Agents.
1998	Moderator & Organizer	Panel on Security in Mobile Systems, ACM/IEEE Mobicom '98
1998	Presented a tutorial on at Computational Intelligence	IEEE WCCI
1998	& Data Mining Session chair (mobile databases session)	IEEE ICDE'98
1997	Organizer, Panel Cooperative MultiAgent systems for the W	CoopIS'97.
1996	Presented a tutorial on Mobile Computing and Web	
1996 Intelligent	Member Program Committee	IASTED/ISMM Intl. Conf.
1996 1996.	Member Program Committee	Information Management Systems IEEE Intl. Conf. Tools wih AI,
1995	Co-Organizer and panelist, minisymposium on Electronic Textbooks, Classrooms and La for Education in Computations Sciences	
1995		EEE First International Conference on Software Testing,
Re	liability and	_
1995	Panelist, AI Tools in Human- Computer Interaction: Perspectives, Issues, and Dire	Quality Assurance IEEE Intl. Conf. Tools with AI. ections

# **University Service**

Chair	CSEE Department
Director	Cyberscholars Program
Director	UMBC Center for Cybersecurity
Member	Research Park Advisor Committee
Member	Dean CoEIT Search Committee
Chair	Dean CoEIT Search Committee
Chair	Vice President for Research Search Committee
Chair	CMSC Faculty Search Committee
	Director Director Member Member Chair Chair

Aug 2010 - Aug 2012 Aug 2010 - date Aug 2010-Oct 2010 March 07 - Summer 07 Aug 06 - Aug 08	GPD Member Interim Chair Member Member	CMSC Program CSEE Executive Committee CSEE Department Faculty Senate Executive Committee University Research Council
Sep 2006 – Aug 2008 Fall 04	Chair Member	CS Promotion and Tenure Committee Search Committee for the Assistant/Associate Vice Provost for Research Administration
Aug 2002 - date Sep 2004 - date April 2004 - date	Member Chair Member	UMBC Computer Policy Committee UMBC Computer Policy Committee Internal Advisory board for Alex Brown
Center. Aug 1998 - date Aug 1999 - date Aug 1999 - 2001	Member Member Chair	CS Graduate Committee CS Graduate Admissions Committee CS Graduate Admissions Committee
Aug 1999 - May 2002 Aug 2003 - date Aug 1998 - date	Member Chair Member	CS Faculty Search Committee CS Equipment Committee CS Equipment Committee
(at Univ of Missouri) Jan 1997- Aug98 Jan 1997 - Aug98 Aug 1997 - Aug 98 Jan 1997 - Aug1997 1997	Coordinator Member Member Member Member	Internet Information Services Library Committee Graduate Committee Course & Curriculum Committee Faculty Search Committee