

PADMAVATHI V. MUNDUR

University of Maryland Institute for Advanced Computer Studies (UMIACS)
University of Maryland, College Park
A. V. Williams Building
College Park, Maryland 20742
Email: pmundur@umiacs.umd.edu
Tel: (301) 405-1652
Fax: (301) 314-9658
Office: Room 4451, A. V. Williams Building

CITIZENSHIP: UNITED STATES

BRIEF BIO: Padma Mundur is a research scientist at UMIACS. She is the PI for a project that involves building a laboratory-based scalable wireless testbed used for evaluating Delay Tolerant Network (DTN) protocols and applications. This project is funded by the Laboratory for Telecommunications Sciences (LTS). She supervises 3 GRAs working on the project. During her tenure at University of Maryland, Baltimore County (UMBC), she was research adviser to 12 graduate/under-graduate students, five of whom produced M.S. Thesis and one graduated with a Ph.D. While at UMBC, she taught graduate and undergraduate courses in Computer Networks, Databases, and Multimedia systems. She has authored over 30 refereed publications and has served on the editorial board of IEEE Communications Surveys and Tutorials Journal since 2005. Her combined research funding at UMBC and UMD stands at more than \$1 million.

RESEARCH INTERESTS:

Delay/Disruption Tolerant Networks, Wireless and Ad Hoc Networks, Mobile Technologies and Social Networking, Multimedia Systems and Web Technologies, Distributed Systems, Analytical and Simulation Performance Modeling

EDUCATION:

Ph.D.	2000	George Mason University, Fairfax, VA, Information Technology
M.E.	1990	University of Virginia, Charlottesville, VA, Systems Engineering
PG-Diploma	1986	Indian Institute of Science, India, Industrial Management
B.E.	1985	Bangalore University, India, Industrial Engineering

WORK EXPERIENCE:

2006 – Present	Research Scientist, Institute for Advanced Computer Studies (UMIACS), University of Maryland, College Park, MD
2000 - 2006	Assistant Professor, University of Maryland Baltimore County (UMBC), Department of Computer Science and Electrical Engineering, Baltimore, MD

1998 - 1999	GRA, Center for Image Analysis, Computer Science Department, George Mason University, Fairfax, VA
1995 - 1998	UNIX Systems Administrator, Computer Science Department and Center for New Engineer, George Mason University, Fairfax, VA
1996 Fall	Intern, Georgetown University Medical Center, Imaging Science and Information Systems (ISIS) Research Center, Georgetown, Washington, D.C.
1993 - 1995	GTA, Computer Science Department, George Mason University, Fairfax, VA
1991 - 1992	Management Engineer, Georgetown University Hospital, Georgetown, Washington, D.C.

RESEARCH FUNDING:

2006 – 2012	UMIACS -- Delay Tolerant Networks Research – Testbed, Traces, and Applications, Single PI, Funding support for full salary plus 3 GRAs, Laboratory for Telecommunications Sciences (LTS) (more than \$1 million at the end of FY2011)
2005 – 2006	UMBC -- Delay Tolerant Networks Research -- Routing Algorithms and Protocols, Single PI, \$108,000, Laboratory for Telecommunications Sciences (LTS), total proposed amount: \$351,145 for three years
2004 – 2005	UMBC -- NASA GSFC Cyberinfrastructure Initiative, \$79,075, NASA, Co-PI (PI: Milton Halem, other Co-PIs: Ray Chen, Yelena Yesha)
2001	UMBC -- Mobile Multimedia and Streaming Technologies: A State of the Art Survey, \$25,170, AetherSystems Inc. PI (Co-PI: Anupam Joshi)

TEACHING AT UMBC:

Graduate and Undergraduate courses taught (Course load: 3 courses per academic year)

- Multimedia Networking and Data Management (CMSC691M - Graduate) Class Size: around 10
- Computer Networks (CMSC481 - UG) Class Size: around 40
- Modeling and Simulation of Computer Systems (CMSC625 - Graduate) Class Size: around 10
- Distributed Multimedia Systems (CMSC491/691M – UG/G) Class Size: around 25
- Principles of Database Systems (CMSC661 - Graduate) Class Size: around 40
- Database Management Systems (CMSC461 - UG) Class Size: around 40

STUDENTS SUPERVISED:

At UMD for the DTN Testbed and Other projects on LTS Funding:

1. Jonathan Jesuraj, Summer 2011 - present
2. Keith Taylor, Spring 2011 – present (Unofficial Adviser for MS Thesis)
3. Carson Dunbar, Fall 2010 - present
4. Youngil Kim, Summer 2010 - Spring 2011 (Unofficial Adviser for MS Project)

5. Atul Lunawat, Spring 2010 (part of)
6. Inkeun Cho, Fall 2009
7. Dongwoon Hahn, Summer 2009 - Spring 2010
8. Kun Lin, Summer 2009
9. Ginnah Lee, Jan 2008 - Summer 2010
10. Yi-Jung Lo, Fall 2007

At UMBC:

Ph.D. Students (Chair/Advisor for all):

1. Yong Rao, "Automatic multimedia content analysis and management," Ph.D., Graduated August 2006
2. Sookyong Lee, "Routing algorithms for delay tolerant networks," In progress at the time of my leaving UMBC, August 2006

Master's and Undergraduate Students (Chair/Advisor for all):

1. Ushashree Kaja, "Security solutions for delay tolerant networks – a survey," MS Project 2006
2. Yun Teng, "Performance analysis of delay tolerant networks," MS **Thesis** 2005
3. Poorva Arankalle, "Clustered server architecture for Internet streaming," MS **Thesis** 2004
4. Nikunj Patel, "Music information retrieval and query by humming," MS **Thesis** 2004
5. Amit Mahajan, "QoS issues for multimedia applications in mobile and wireless environment," MS **Thesis** 2003
6. Ashwatha Matthur, "Integrated solutions for streaming applications on the Internet," MS **Thesis** 2003
7. Snehal Manohar, "Information extraction using overlay text in videos," MS Project 2004;
8. Peng Yu Liu, "Internet multicasting for streaming applications," MS Project 2004
9. Kevin Fisher, Undergraduate Research Assistant, NASA Cyberinfrastructure Project 2004-2005
10. Eric Eaton, Undergraduate Research Assistant, Summer 2002 "Multi-tier video conferencing architectures,"– Poster presentation at the Undergraduate Research & Creative Achievement Day

Service on Ph.D. and M.S. Thesis Committees

1. Tom Goff, Ph. D., Graduated 2006, Member, Advisor: D. Phatak
2. Edward Ziegler, Ph. D., In Progress 2005, Member, Advisor: D. Sidhu
3. Kemal Akkaya, Ph.D., Graduated 2005, Member, Advisor: M. Younis
4. Gargi Banerjee, Ph.D., Graduated 2003, Member, Advisor: D. Sidhu
5. Aseem Lalani, MS Thesis 2006, Member, Advisor: M. Younis
6. Kevin Atkinson, MS Thesis 2005, Member, Advisor: C. Nicholas
7. Fang Yan, MS Project 2004, Reader, Advisor: Y. Yesha
8. Gaurav Gupta, MS Thesis 2003, Member, Advisor: M. Younis
9. Kunjan Naik, MS Project 2003, Reader, Advisor: D. Phatak
10. Shamit Patel, MS Thesis 2002, Member, Advisor: K. Kalpakis

PUBLICATIONS:

30 publications of which 8 are journal articles and 22 are in conference/workshop proceedings

Journal Articles (Refereed):

1. P. Mundur, S. Lee, and M. Seligman, "Routing in Intermittent Networks using Storage Domain," Accepted for Publication in *Journal on Wireless Communications & Mobile Computing*, Wiley InterScience August 2009, early view online publication, October 2009 (will be published in a regular issue in 2011).
2. M. Seligman, K. Fall, and P. Mundur, "Storage Routing for DTN Congestion Control," *Journal on Wireless Communications & Mobile Computing*, Wiley InterScience, Vol. 7, Issue 10, pp 1183-1196, December 2007.
3. P. Mundur and P. Arankalle, "Optimal Server Allocations for Streaming Multimedia Applications on the Internet," *Computer Networks Journal*, Elsevier, Vol. 50, Issue 18, pp 3608-3621, December 2006.
4. P. Mundur, Y. Rao, and Y. Yesha, "Keyframe-based Video Summarization using Delaunay Clustering," *International Journal on Digital Libraries*, Springer Berlin/Heidelberg, Vol. 6, No. 2, pp 219-232, April 2006.
5. P. Mundur, A. Sood, and R. Simon, "Class-based Access Control for Distributed Video-on-Demand Systems," *IEEE Transactions on Circuits and Systems on Video Technology*, Vol. 15, No. 7, pp 844-853, July 2005.
6. P. Mundur, R. Simon, and A. Sood, "End-to-end Analysis of Distributed Video-on-Demand Systems," *IEEE Transactions on Multimedia*, Vol. 6, No. 1, pp 129-141, February 2004. (Journal Impact Factor 6 – among top 20 journals in Telecommunications, source: www.ieee.org).
7. P. Mundur, R. Simon, and A. Sood, "The Analysis and Performance of Multi-rate Service in Distributed Video-on-Demand Systems," *Journal of Multimedia Tools and Applications*, Vol. 17, No. 1, pp 51-75, May 2002.
8. R. Simon, P. Mundur, and A. Sood, "Access Policies for Distributed Video-on-Demand Systems," *Journal of the Washington Academy of Sciences*, Special Issue on Communications, Vol. 85, No. 2, pp 155-176, December 1998.

Conference Proceedings (All Refereed):

1. Y. Kim, K. Taylor, C. Dunbar, B. Walker, and P. Mundur, "Reality vs. Emulation: Running Real Mobility Traces on a Mobile Wireless Testbed," Proc. of *HotPlanet Workshop* (in conjunction with ACM Mobisys 2011), Bethesda, MD.
2. D. Hahn, G. Lee, B. Walker, M. Beecher, and P. Mundur, "Using Virtualization and Live Migration in a Scalable Mobile Wireless Testbed," Proc. of *HotMetrics Workshop* (in conjunction with ACM SIGMETRICS 2010), June 20, New York, NY.
3. D. Hahn, G. Lee, I. Cho, B. Walker, M. Beecher, and P. Mundur, "Scalable Mobile Wireless Testbed using Virtualization," Demo at *HotMobile Conference* 2010, February 21, Annapolis, MD.
4. B. Walker, P. Mundur, G. Lee, and K. Lin, "A Plan for Performing Large Scale DTN Experiments on the MeshTest Wireless Testbed," Proc. of *ExtremeCom* 2009, August Sweden.

5. P. Mundur, M. Seligman, and G. Lee, "Epidemic Routing with Immunity in Delay Tolerant Networks," Proc. of *IEEE MILCOM*, November 17-19, 2008, San Diego, CA.
6. P. Mundur, M. Seligman, and G. Lee, "Immunity-based Epidemic Routing in Intermittent Networks," Proc. of *IEEE SECON* (Poster), June 16-20, 2008, San Francisco, CA.
7. P. Mundur and M. Seligman, "Delay Tolerant Network Routing: Beyond Epidemic Routing," Proc. of *ISWPC*, May 7-9, 2008, Santorini, Greece.
8. P. Mundur, S. Lee, and M. Seligman, "Routing for Data Delivery in Dynamic Networks," Proc. of *MILCOM*, October 2006, San Diego CA.
9. P. Mundur, S. Lee, and M. Seligman, "Routing in Intermittent Network Topologies," Proc. of *MSWiM*, October 2006, Malaga, Spain.
10. M. Seligman, K. Fall, and P. Mundur, "Alternative Custodians for Congestion Control in Delay Tolerant Networks," *SIGCOMM Workshop CHANTS*, September 2006.
11. Y. Rao, P. Mundur, and Y. Yesha, "Fuzzy SVM Ensembles for Relevance Feedback in Image Retrieval," Proc. of *Conference on Image and Video Retrieval (CIVR)*, May 2006.
12. N. Patel and P. Mundur, "An n -gram-based Approach for Finding Repeating Patterns in Musical Compositions," Proc. of *European Internet and Multimedia Systems and Applications Conference, EuroIMSA, Sponsored by LASTED*, Switzerland, February 2005.
13. Y. Rao, P. Mundur, and Y. Yesha, "Automatic Video Summarization for Wireless and Mobile Environment," Proc. of *IEEE International Conference on Communications (ICC)*, Paris, France, June 20-24, 2004. (about 30% acceptance rate)
14. A. Matthur and P. Mundur, "Dynamic Load Balancing across Mirrored Multimedia Servers," Proc. of *IEEE Conference on Multimedia Expo (ICME)*, Baltimore, MD, July 6-9, 2003. (about 25% acceptance rate)
15. A. Matthur and P. Mundur, "Congestion Adaptive Streaming: An Integrated Approach," Proc. of *Distributed Multimedia Systems (DMS)*, Miami, FL, September 24-26, 2003.
16. A. Mahajan, P. Mundur, and A. Joshi, "Adaptive Multimedia System Architecture for Improving QoS in Wireless Networks," Proc. of *3rd IEEE Pacific -Rim Conference on Multimedia (PCM)*, Taipei, Taiwan, December 16-18, 2002.
17. P. Mundur, A. Sood, and R. Simon, "A Multi-rate Service Model for Distributed Video-on-Demand Systems," Proc. of *Conference on Internet and Multimedia Systems and Applications (IMSA'00)*, Las Vegas, Nevada, November 20-23, 2000.
18. R. Simon, A. Sood, and P. Mundur, "Network Service Selection for Distributed Multimedia Applications," Proc. of *International Conference on Computational Intelligence and Multimedia Applications (ICCIMA '99)*, New Delhi, India, September 23-26, 1999.
19. P. Mundur, R. Simon, and A. Sood, "Integrated Admission Control in Hierarchical Video-on-Demand Systems," Proc. of *IEEE International Conference on Multimedia Computing and Systems (ICMCS '99)*, pp 220-225, Florence, Italy, June 7-11, 1999. (about 25 % acceptance rate)
20. P. Mundur, R. Simon, and A. Sood, "End-to-End Request Handling in Distributed Video-on-Demand Systems," Proc. of *Conference on Communication Networks and Distributed Systems Modeling and Simulation Conference, CNDS (The Society for Computer Simulation)*, pp 151-156, San Francisco CA, January 17-20, 1999.
21. P. Mundur, A. Sood, and R. Simon, "Threshold-based Admission Control for Multi-class Video-on-Demand Systems," Proc. of *IEEE International Performance, Computing, and Communications Conference (IPCCC'98)*, pp 154-160, Phoenix AZ, February 1998. (about 30% acceptance rate)

22. K. R. Cleary, B. A. Levine, G. S. Norton, and P. V. Mundur, "Challenges in Sending Large Radiology Images over Military Communications Channels," Proc. of *SPIE Conference on PACS Design and Evaluation*, Vol. 3035, pp 230-236, February 1997.

Other

P. Mundur, "An Integrated Approach to End-to-End Analysis of Distributed Video-on-Demand Systems," *Ph.D. Dissertation*, Spring 2000.

Non-Peer-Reviewed Works

1. P. Mundur, M. Seligman, and S. Lee, "Routing in Delay Tolerant Networks using Storage Domains," UMIACS-TR-2007-01, <http://hdl.handle.net/1903/4024>, November 2006.
2. P. Mundur, "Quickest Delivery using Modified Breadth First Search in Delay Tolerant Networks," Technical Report TR-CS-05-04, University of Maryland Baltimore County, July 2005.
3. Peng Yu Liu and P. Mundur, "Multimedia Multicast over the Internet – A Survey," Technical Report TR-CS-05-03, University of Maryland Baltimore County, May 2004.
4. A. Mahajan, P. Mundur, and A. Joshi, "Mobile multimedia and streaming technologies: a survey," Technical Report TR-CS-05-02, University of Maryland Baltimore County, August 2002.
5. P. Mundur, A. Sood, and R. Simon, "Effects of Traffic Reshaping on Distributed Video-on-Demand Systems," Technical Report TR99-04, George Mason University, May 1999.

PROFESSIONAL SERVICE:

Recent and Continuing Professional Activities

- Editorial Board Member, IEEE Communications Surveys and Tutorials Online Journal, since 2005 (Impact Factor 3.692 included in the ISI citation report; ranking in the telecommunications area is 3 out of 80)
- Program Committee Member for IWCMC 2012, HotPlanet 2011

Other Professional Service

Program Committee Member VTC 2008, ICC 2008, GLOBECOM 2008, ICME 2007, GLOBECOM 2007, ICDCS 2006, ICME 2005, ICDCS 2004, ICME 2004, Trusted Internet Workshop 2003

Session Chair and Program Committee member at GLOBECOM 2007, Washington DC;
Session Organizer on Communication Networks Simulations at Winter Simulation Conference, (WSC) 2006, December 3-6 2006, Monterey, CA;

NSF Panel Reviewer, CSR-PDOS, April 6-7, 2006;

NSF Panel Reviewer, CSR - CISE, March 28-29, 2005;

NSF Panel Reviewer, CAREER Distributed Systems - CISE, November, 2003;

NSF Panel Reviewer, ITR Operations Research, April 2001;

Referee for funding applications, Research Council of Norway, September 2002;

Guest Editor, Special Issue on Wired and Wireless Multimedia for Journal of High Speed Networks, Sept-Oct. 2002;

Reviewer for IEEE Transactions on Multimedia, IEEE Multimedia, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on Fuzzy Systems, IEEE Transactions on Parallel and Distributed Systems, Journal of Systems and Software Journal of Information Systems, Journal of High Speed Networks, Journal on Digital Libraries.

Presentations/Demos at Conferences/Workshops:

1. DTN testbed Demo at HotMobile 2010, HotMetrics 2010, CHANTS 2010 and 2011, HotPlanet 2011
2. Epidemic Routing with Immunity in Delay Tolerant Networks, MILCOM Conference, San Diego, CA, November 17-19, 2008.
3. Immunity-based Epidemic Routing in Intermittent Networks, SECON Conference, San Francisco, CA, June 16-20, 2008.
4. Routing in Intermittent Network Topologies, MSWiM Conference, Torremolinos, Malaga, Spain, October 2-6, 2006.
5. Automatic Video Summarization for Wireless and Mobile Environment, IEEE International Conference on Communications (ICC), Paris, France, June 20-24, 2004.
6. Dynamic Load Balancing across Mirrored Multimedia Servers, IEEE Conference on Multimedia Expo (ICME), Baltimore, MD, July 6-9, 2003.
7. Congestion Adaptive Streaming: An Integrated Approach, Distributed Multimedia Systems (DMS), Miami, FL, September 24-26, 2003.
8. Adaptive multimedia system architecture for improving QoS in wireless networks, Pacific-rim Conference on Multimedia (PCM'02) Taipei, Taiwan, December 16-18, 2002.
9. A Multi-rate service model for distributed video-on-demand systems, Internet and Multimedia Systems and Applications (IMSA'00), Las Vegas, Nevada, November 20-23, 2000.
10. Integrated admission control in hierarchical video-on-demand systems, IEEE International Conference on Multimedia Computing and Systems (ICMCS'99), Florence, Italy, June 7-11, 1999.
11. End-to-end request handling in distributed video-on-demand systems, Conference on Communication Networks and Distributed Systems Modeling and Simulation (CNDS'99), The Society for Computer Simulation International, San Francisco, CA, January 17-20, 1999.
12. Threshold-based admission control for multi-class video-on-demand systems, IEEE International Conference on Performance, Computing, and Communications (IPCCC'98), Phoenix, AZ, February 16-18, 1998.

Other Professional Presentations

1. Delay Tolerant Networks, Invited Talk, University of Delaware, April 14, 2007.
2. Research Issues in Multimedia Networking and Data Management, Computer Science Colloquium, Georgetown University, Invited Talk, November 19, 2004.
3. Research Issues in Multimedia Networking and Data Management, Electrical Engineering Seminar, UMBC, November 12, 2004.

4. End-to-end analysis of distributed video-on-demand systems, Graduate Seminar, UMBC, November 10, 2000.

University and Departmental Service at UMBC:

2006	Faculty Affairs Committee for Faculty Senate, University level
2005-2006	Faculty Advisor for Systems Engineering Program, College Level
2003, 2005, 2006	Committee Member, Admissions Committee
2002-2004	Committee Member, Scheduling Committee
Fall 2002	Committee Member, Colloquia Committee
2000-2002	Committee Member, Graduate Committee
Fall 2001	Departmental Seminar Coordinator
2001-2006	Undergraduate Student Adviser
Fall 2001	Instructor on Record (IOR) for an IFSM on-line course on Computer Networks, College level