

Victoria Manfredi

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Research interests

Computer Networks, Communication Protocols, Network Science, Applications of Machine Learning to Network Data, Network Privacy

Education

Ph.D. Computer Science, University of Massachusetts Amherst **September 2009**
Advisor: Jim Kurose. Title: Sensor Control and Scheduling Strategies for Sensor Networks.
M.S. Computer Science, University of Massachusetts Amherst **May 2005**
B.A. Computer Science, Neuroscience, Smith College **May 2002**
magna cum laude with highest honors in computer science.

Professional Experience

Assistant Professor of Computer Science **July 2016 to Present**
Wesleyan University, Middletown, Connecticut, USA
Scientist II **October 2015 to May 2016**
Raytheon BBN Technologies, Cambridge, Massachusetts, USA
Scientist I **October 2011 to October 2015**
Raytheon BBN Technologies, Cambridge, Massachusetts, USA
Computing Innovation Fellow **September 2009 to September 2011**
Boston University, Boston, Massachusetts, USA. Mentor: Mark Crovella
Visiting Researcher **January 2007 to June 2007**
École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland

Refereed Conference Publications

- [13] **SHARE: Scalable Hybrid Adaptive Routing for dynamic multi-hop Environments**
V. Manfredi, Will Tetteh, Ram Ramanathan, Regina Hain, Dorene Ryder
In Proc. of *IEEE Conference on Ubiquitous Intelligence and Computing (UIC)*, 2017, 8 pages
Awarded Best Industry Paper
- [12] **Rebound: Decoy Routing on Asymmetric Routes Via Error Messages**
Daniel Ellard, Christine Jones, V. Manfredi, W. Timothy Strayer, Bishal Thapa, Megan Van Welie, Alden Jackson
In Proc. of *IEEE Local Computer Networks Conference (LCN)*, 2015, pp. 91-99
- [11] **Scalability Analysis of Grid-Based Multi-Hop Wireless Networks**
Rahul Uргаonkar, V. Manfredi, Ram Ramanathan
In Proc. of *International Conference on COMmunication Systems and NETworkS (COMSNETS)*, 2013, 10 pages

- [10] **Understanding Stateful vs. Stateless Communication Strategies for Ad hoc Networks**
V. Manfredi, Mark Crovella, Jim Kurose
 In Proc. of *International Conference on Mobile Computing and Networking (MobiCom)*, 2011, pp. 313-324

- [9] **Separation of Sensor Control and Data in Closed-Loop Sensor Networks**
V. Manfredi, Jim Kurose, Naceur Malouch, Chun Zhang, Michael Zink
 In Proc. of *IEEE Conference on Sensor, Mesh and Ad hoc Communications and Networks (SECON)*, 2009, 9 pages

- [8] **Robust Routing in Dynamic MANETS**
V. Manfredi, Robert Hancock, Jim Kurose
 In Proc. of *Annual Conference of the International Technology Alliance (ACITA)*, 2008, 8 pages

- [7] **Scan Strategies for Adaptive Meteorological Radars**
V. Manfredi, Jim Kurose
 In Proc. of *Neural Information Processing Systems (NIPS)*, 2007, pp. 993-1000

- [6] **Switching Kalman Filters for Prediction and Tracking in an Adaptive Meteorological Sensing Network**
V. Manfredi, Sridhar Mahadevan, Jim Kurose
 In Proc. of *IEEE Conference on Sensor, Mesh and Ad hoc Communications and Networks (SECON)*, 2005, pp. 197-206

- [5] **Learning Hierarchical Models of Activity**
 Sarah Osentoski, **V. Manfredi**, Sridhar Mahadevan
 In Proc. of *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2004, pp. 891-896

Refereed Workshop Publications

- [4] **MultiFlow: Cross-Connection Decoy Routing using TLS 1.3 Session Resumption**
V. Manfredi, Pi Songkuntham
 In Proc. of *8th USENIX Workshop on Free and Open Communications on the Internet (FOCI)*, 2018, 7 pages

- [3] **Hierarchical Reinforcement Learning Using Graphical Models**
V. Manfredi, Sridhar Mahadevan
 In Proc. of *ICML Workshop on Rich Representations for Reinforcement Learning*, 2005, pp. 39-44

- [2] **Meteorological Command and Control: An End-to-end Architecture for a Hazardous Weather Detection Sensor Network**
 Michael Zink, David Westbrook, Sherief Abdallah, Bryan Horling, Vijay Lakamraju, Eric Lyons, **V. Manfredi**, Jim Kurose, Kurt Hondl
 In Proc. of *MobiSys Workshop on End-to-End, Sense-and-Respond Systems, Applications, and Services*, 2005, pp. 37-42

- [1] **Nonlinear Credit Assignment for Musical Sequences**
 Judy Franklin, **V. Manfredi**
 In Proc. of *International Workshop on Intelligent Systems Design and Applications (ISDA)*, 2002,

pp. 245-250

Awarded Grants and Contracts

Office of Naval Research (ONR) contract: Probe-Observe-Knowledge-Engine (POKE), \$680k. Technical lead for modeling engine. PI: Karen Haigh. August 2015 to March 2016.

Defense Advanced Research Programs (DARPA) contract: Scalable Heterogeneous Adaptive Routing in contested Environments (SHARE), \$1.8M. Technical lead for routing. PI: Ram Ramanathan. August 2014 to 2016.

National Science Foundation (NSF) grant: #CNS-1117039, NeTS: Small: Understanding Communication Strategies for Ad hoc Networks, \$390,853. Primary author of proposal. Would have provided 3 years of postdoctoral funding for me. PI: Mark Crovella. August 2011 to July 2014.

Patents

Destination address rewriting to block peer-to-peer communications

Inventors: Daniel Ellard, Alden Jackson, Christine Jones, Josh Karlin, **V. Manfredi**, David Mankins, Tim Strayer
United States 9,723,023. Issued August 2017

Destination address control to limit unauthorized communications

Inventors: Daniel Ellard, Alden Jackson, Christine Jones, Josh Karlin, **V. Manfredi**, David Mankins, Tim Strayer
United States 9,237,027. Issued January 2016

Honors

2017	Best Industry Paper at UIC 2017
2012-2016	Raytheon BBN Business Development Awards
2013	Part of 1st place team in Raytheon BBN-wide Business Development Initiative
2011-2012	Tomlinson Fellowship for Postdoctoral Research at McGill University (declined)
2009-2011	CCC/CRA Computing Innovation Fellowship for Postdoctoral Research
2006	NSF International Research and Education in Engineering Supplement
2003-2006	NSF Graduate Research Fellowship
2002	Smith College Alumnae Scholarship (for graduate study)
2002	Bert Mendelson Prize for Excellence in Computer Science , Smith College
2002	Phi Beta Kappa Honor Society inductee
2002	Sigma Xi Honor Society inductee
2000	Schultz Foundation Undergraduate Research Fellowship , Smith College
1998-2002	First Group Scholar (top 10% of class), Smith College

Invited Talks

Decoy Routing on Asymmetric Routes Via Error Messages

University of Connecticut, Storrs, Connecticut, March 31, 2017. Host: Bing Wang.

Decoy Routing on Asymmetric Routes Via Error Messages

McGill University, Montréal, Québec, January 13, 2017. Host: Mark Coates.

A Brief Tour of Network Science

REU Data Science Lunch Seminar, University of Massachusetts Amherst. July 9, 2015.

Raytheon BBN Technologies and Life After Grad School

Computer Science Women's Group, University of Massachusetts Amherst. April 22, 2015.

Rethinking Communication in Ad hoc Networks

University of Massachusetts Boston, Boston, Massachusetts. February 2014. Host: Duc Tran.

Understanding Communication Strategies for Dynamic Networks

INRIA, Sophia Antipolis, France. Host: Giovanni Neglia, May 2011.

Choosing a Network Formation Strategy

Deutsche Telekom Laboratories, Berlin, Germany. Host: Ruben Merz, October 2010.

Robust Routing in Dynamic Networks

ETHZ, Zurich, Switzerland. Host: Bernhard Plattner, July 2009.

Robust Routing in Dynamic Networks

Boston University, Boston, Massachusetts. Host: Mark Crovella, June 2009.

Conference and Workshop Talks

MultiFlow: Cross-Connection Decoy Routing using TLS 1.3 Session Resumption

FOCI, Baltimore, Maryland. August, 2018.

SHARE: Scalable Hybrid Adaptive Routing for dynamic multi-hop Environments

UIC, Fremont, California. August, 2017.

Rebound: Decoy Routing on Asymmetric Routes Via Error Messages

New England Networking and Systems Day, Boston, Massachusetts. October 19, 2015.

Understanding Stateful vs Stateless Communication Strategies for Ad hoc Networks

MobiCom, Las Vegas, Nevada, September 2011.

Separation of Sensor Control and Data in Closed-Loop Sensor Networks

SECON, Rome Italy, June 2009.

Robust Routing in Dynamic MANETs

ACITA, London, United Kingdom, September 2008.

Switching Kalman Filters for Prediction and Tracking in an Adaptive Meteorological Sensing Network

SECON, Santa Clara, California, September 2005.

Hierarchical Reinforcement Learning Using Graphical Models

ICML Workshop on Rich Representations for Reinforcement Learning, Bonn, Germany, August 2005.

Conference Organization

Publication Co-Chair, *IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, Washington, DC, 2019.

Publication Co-Chair, *IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, Chania, Greece, 2018.

Publication Co-Chair, *IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, Macau, China, June 12 to June 15, 2017.

Publication Chair, *IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, Coimbra, Portugal, June 21 to June 24, 2016.

Publication Chair, *IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, Boston, Massachusetts, June 14 to June 17, 2015.

Technical Program Committee Chair, *International Workshop on Wireless Mesh and Ad-hoc Networking (WiMAN)*, Shanghai, China, August 7, 2014.

Technical Program Committees

Technical Program Committee Member, *IFIP Networking*, Warsaw, Poland on May 20-22, 2019.

Technical Program Committee Member, *IFIP Networking*, Zurich, Switzerland, May 14-16, 2018.

Technical Program Committee Member, Session Chair, *IEEE International Conference on Ubiquitous Intelligence and Computing (UIC)*, San Francisco, August 4-8, 2017.

Technical Program Committee Member, *Workshop on Multimedia Streaming in Information-/Content-Centric Networks (MuSIC)*, Hong Kong, July, 2017.

Technical Program Committee Member, *IEEE International Workshop on Wireless Mesh and Ad Hoc Networks (WiMAN)*, Waikolo, Hawaii, August 4, 2016.

Technical Program Committee Member, *IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS), Algorithms and Performance Analysis Track*, Washington, DC, May 26 to May 28, 2016.

Technical Program Committee Member, *IEEE International Performance Computing and Communications Conference (IPCCC)*, Las Vegas, Nevada, December 9 to December 11, 2016.

Technical Program Committee Member, *IEEE International Conference on Sustainable Computing and Communications (SustainCom)*, Atlanta, GA, October 8 to October 10, 2016.

Technical Program Committee Member, *Workshop on Multimedia Streaming in Information-/Content-Centric Networks (MuSIC)*, San Francisco, CA, April, 2016.

Technical Program Committee Member, *MASS Workshop on Content-Centric Networking (CCN)*, Dallas, Texas, October 19, 2015.

Technical Program Committee Member, *IEEE Vehicular Technology Conference (VTC) - Fall, Track on Ad hoc and Sensor Networks*, Boston, Massachusetts, September 6 to September 9, 2015.

Technical Program Committee Member, *IEEE International Military Communications Conference (MILCOM), Track 2*, Tampa, Florida, October 26 to October 28, 2015.

Technical Program Committee Member, *IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, Boston, Massachusetts, June 14 to June 17, 2015.

Technical Program Committee Member, *IEEE International Military Communications Conference (MILCOM), Track 3*, Baltimore, Maryland, October 6 to October 8, 2014

Technical Program Committee Member, *International Conference on Computer Communication Networks (ICCCN), Track on Wireless LAN, Ad Hoc and Mesh Networks (WAM)*, Shanghai, China, August 4 to August 7, 2014.

Technical Program Committee Member, Session Chair, *Internet Measurement Conference (IMC)*, Barcelona, Spain, October 23 to October 24, 2013.

Technical Program Committee Member, *ICCCN, Track on Wireless LAN, Ad Hoc and Mesh Networks (LAMN)*, Munich, Germany, July 30 to August 2, 2012.

Technical Program Committee Member, *ICCCN, Network Algorithms and Performance Evaluation (NAPE)*, Maui, Hawaii, July 31 to August 4, 2011.

Funding Panels

Participant on panel to review grants for *NSF CISE*, 2014.

Participant on panel to review grants for *NSF CISE*, 2013.

Editorial Boards

December 2016 to Present. Executive Editor, *Wiley Transactions on Emerging Telecommunications Technologies (ETT)*.

External Reviewer

Conferences. *INFOCOM 2017, INFOCOM 2018*.

Journals. *Journal on Selected Areas in Communication, Wireless Networks, Transactions on Mobile Computing*.

Teaching Experience

Spring 2018, Fall 2018. Instructor, COMP 332: Computer Networks, Wesleyan University. This is a an undergraduate course providing an introduction to the field of computer networking, with 34 students.

Fall 2017. Instructor, COMP 211: Principles of Imperative Computation, Wesleyan University. This is a an undergraduate course that is the first core course required for the computer science major, with 45 students. We've chosen to use the C programming language, and the course involves weekly homework assignments and laboratories, plus a midterm and final exam.

Spring 2017. Co-instructor (with Norman Danner), COMP 211: Principles of Imperative Computation, Wesleyan University. This is a an undergraduate course that is the first core course required for the computer science major, with 50 students. We've chosen to use the C programming language, and the course involves weekly homework assignments and laboratories, plus a midterm and final exam.

Fall 2016. Instructor, COMP 360: Special Topics in Computer Science (Computer Networks), Section 1, Wesleyan University. This is a an undergraduate course providing an introduction to the field of computer networking, with 25 students.

Student Tutorials

Spring 2018. Aqila Putri, Wesleyan University. Supervised 1 credit graded tutorial on the topic of security protocols used on the Internet.

Spring 2018. Caroline Liu, Wesleyan University. Supervised 0.5 credit ungraded reading tutorial on routing protocols in mobile (and flying) ad hoc networks.

Spring 2018. Celine Tao, Wesleyan University. Supervised 1.0 credit graded tutorial on topics in computer networks.

Spring 2018. Tomas Tucek, Wesleyan University. Supervised 1 credit graded tutorial looking at measures of anonymous communication.

Fall 2017 Caroline Liu, Wesleyan University. Supervised 0.5 credit ungraded reading tutorial on routing protocols in mobile (and flying) ad hoc networks. Caroline read related papers and experimented with Raspberry Pis.

Fall 2017. Fabien Bessez and Victoria Davids, Wesleyan University. Supervised reading tutorial for Fabien (1 credit graded) and Victoria (0.5 credit ungraded) on the topic of security protocols used on the Internet such as Transport Layer Security (TLS). Fabien and Victoria produced a code repository, containing scripts to test out different protocols.

Fall 2017. Samantha Ong, Wesleyan University. Supervised 1 credit graded reading tutorial for this student on the topic of machine learning methods with a particular emphasis on deep learning. Sam worked through machine learning exercises online and wrote a final paper on the topics discussed.

Spring 2017. Francesca Peña, Wesleyan University. Supervised 1 credit graded reading tutorial for this student on the topic of artificial intelligence, decision-making and how to eliminate algorithmic bias. Francesca wrote a final paper on the topics discussed.

Spring 2017. Pi Songkuntham, Wesleyan University. Supervised 1 credit graded reading tutorial for this student on the topic of privacy and anonymity on the Internet. Pi wrote reviews of the papers read during the tutorial and a final paper on the topics discussed.

Research Advisees

Summer 2018. Tomas Tucek, Wesleyan University graduate. Just graduated student working on measures to quantify anonymous communication.

Summer 2017 to May 2018. Pi Songkuntham, Wesleyan University. Undergraduate working on developing and implementing protocols for anti-censorship on the Internet. Over the summer, Pi was funded by a Wesleyan Research in the Summer Sciences fellowship. Pi has continued working with me (as time permits) on this project since Summer 2017.

Summer 2017. Kathleen McLaughlin, Smith College graduate. Just graduated student who worked on setting up a drone emulation as well as with Raspberry Pi processors in the context of a larger peer-to-peer drone communication project.

External Reviewer for PhD Thesis

June 2017. Shohreh Shaghaghian, McGill University. Adviser: Mark Coates.

Reader for Undergraduate Theses

April 2018. Samantha Ong, Wesleyan University. Adviser: Dan Licata.

April 2017. Emily Black, Wesleyan University. Adviser: Dan Licata.

April 2017. Sam Stern, Wesleyan University. Adviser: Danny Krizanc.

Wesleyan and Departmental Service

March 2018 to Present. Wesleyan University, Wesfiles Working Group.

September 2016 to Present. Wesleyan University, Department of Mathematics and Computer Science, Departmental Advisory Committee (DADCOM/CADCOM).

Wesleyan Outreach

Spring 2018. Natural Sciences and Mathematics (NSM) lunch talk, Wesleyan University.
Title: Fighting Anti-Censorship on the Internet, March 30, 2018.

Fall 2016 to Present. Faculty mentor to Wesleyan Track & Field team via Athletics Partnering Program.

Fall 2016. Guest lecture, CIS 221: Research Frontiers in the Sciences, College of Integrative Sciences, Wesleyan University. Lecture title: A Brief Tour of Network Science, November 4, 2016.

Other Service

March 2017 to Present. Networking Networking Women (N2Women) Membership co-chair.

December 2014 to December 2015. Raytheon BBN Technologies, organization of Science Development Program Social Networks Seminar bringing in external speakers.

December 2012 to December 2014. Raytheon BBN Technologies, organization of Tech Talks seminar series for internal speakers in networking department.

Citizenship

American, Canadian