Laura Marie Feeney

http://www.sonri.org/

Research Interests

My interests are in networking and systems, with a broad mix of industry and academic work. My current research is directed toward decentralized wireless networks such as ad hoc, opportunistic and sensor networks. Topics in which I am active include energy-efficient and battery-aware protocols and systems, performance evaluation, and practical network operations. Much of my work is based on developing new measurement techniques, but I am also active in the open source OMNeT++ simulation community.

Education

- **Uppsala University, Sweden**   2016 *(est.)*
  Industry Doctoral Student. Thesis:*Abstraction and Measurement in Decentralized Wireless Networks: Energy, Communication, and the Operating Environment*
  Advisors: Prof. Per Gunningberg, Dr Bengt Ahlgren (SICS)
- **Massachusetts Institute of Technology, USA**   1988-1992
  Course XVIIIC, Mathematics with Computer Science

Professional background (selected)

- **Swedish Institute of Computer Science, Sweden**   1999-2015
  Researcher – Decisions, Networks & Analytics Lab – Pervasive wireless, ad hoc and sensor networks, IoT.
- **Open Group (OSF) Research Institute, USA**   1994-1998
  Researcher – Real Time Computing Group – Distributed real time communication for the Mach μkernel.
- **Looking Glass Studios, USA**   1994-1995
  Project Lead/Software Engineer – Computer game development startup, *System Shock, Flight Unlimited*.
- **Open Software Foundation, USA**   1992-1994
  Consultant, Software Engineer – Reference implementation, OSF Distributed Management Environment.
- **BBN, Inc. Advanced Simulation Division, USA**   1990-1992
  Software Engineer – SIMNET Distributed Warfighting Simulation Network (DARPA/US Army).

Publications (recent & selected)

- L. M. Feeney and V. Fodor. "Reliability in co-located 802.15.4 personal area networks." in *6th ACM Int'l Workshop on Pervasive Wireless Healthcare (MobiHealth)*, 2016.
- L. M. Feeney, C. Rohner, P. Gunningberg, A. Lindgren, and L. Andersson, "How do the dynamics of battery discharge affect sensor lifetime?" in *11th IEEE/IFIP Conf on Wireless On-demand Network Systems and Services (WONS)*, 2014. Best Paper Award.
- D. V. Foster, M. M. Rorick, T. Gesell, L. M. Feeney, and J. G. Foster, "Dynamic landscapes: A model of context and contingency in evolution," *Journal of Theoretical Biology*, vol. 334, pp. 162 172, 2013.
- L. M. Feeney, "Towards trustworthy simulation of wireless MAC/PHY layers: A comparison framework," in *15th ACM Int'l Conf on Modeling, Analysis & Simulation of Wireless & Mobile Systems (MSWiM)*, 2012.
- L. M. Feeney, C. Rohner, and B. Ahlgren, "The impact of wakeup schedule distribution in asynchronous power save protocols on the performance of multihop wireless networks," in *IEEE Wireless Communications and Networking Conf (WCNC)*, 2007.
- L. M. Feeney, B. Ahlgren, and A. Westerlund. "Spontaneous networking: An application-oriented approach to ad hoc networking". *IEEE Communications Magazine*, 39(6):176-181, 2001.
- L. M. Feeney and M. Nilsson, "Investigating the energy consumption of a wireless network interface in an ad hoc networking environment," in *IEEE Conf on Computer Communications (Infocom)*, 2001.

  20 refereed journal and international conference publications; 19 other refereed abstracts, posters, and demos; 2 invited chapters or papers. >3300 citations, h-index = 13 (google).

Keynotes

- Keynote: Perils of success and some nice open problems in sensor networking. *6th IFIP/IEEE Wireless Days Conference*, 2013.
- Keynote: Synchronization problems in multihop wireless networks. *4th Int'l Conf on Wired/Wireless Internet Communications (WWIC)*, 2006.

Talks and Panels (selected)

- "Inter-network interactions in the internet of things". University of Bremen, 2016.
- Panel moderator: "Simulating power consumption in OMNeT++" OMNeT++ Summit, 2015.
- "Inter-network interactions in the internet of things". Freie Universität Berlin, 2015.
- Participating scientist, Uppsala University AIM Day ICT, 2014.
- Panelist, N2Women panel ACM Mobisys, 2014.
- "Sensor lifetime from a battery perspective". KTH eWin Seminar Series, 2013.

Professional Service / Outreach (selected)

- OMNeT++ Workshop/OMNeT++ Community Summit
  Steering Committee, 2013-date; *Panel coordinator*, 2015; *General co-chair*, 2012; *Publicity co-chair*, 2011
- ACM Conf on Modeling, Analysis & Simulation of Wireless & Mobile Systems (MSWiM)
  Demo/Tools Chair, 2013-2015
- ACM SIGMOBILE N2Women: *Panelist* ACM Mobisys, 2014; *Mentor program* IEEE Infocom, 2013
- IFIP Networking: *TPC co-chair*, 2010
- Over fifty technical program committees and over thirty journal reviews.

Programming and Software (selected)

- **OMNeT++/INET Component Advisor**   2014–date
  Evaluation and advising for power consumption and IEEE 802.15.4 models for OMNeT++/INET network simulator.
- **OMNeT++ Energy Framework version 0.9**   2010
  Subsystem for modeling battery consumption of wireless devices in the OMNeT++/mobility-framework simuator. Subsequently adopted in several OMNeT++-based simulators.
- Primarily **C** programmer, **FreeBSD**. Also C++, Python. OMNeT++ simulation environment.

Teaching

- Uppsala University: Project advisor – Computer Communication Project Course, 2016.
- Uppsala University: Guest lecturer – Computer Communication II.
  "Energy aware communication", 2011 - 2015.
- Uppsala University: Guest lecturer – Computer Communication III.
  "Ad Hoc Routing", 2006.
- KTH: Guest lecturer – IP Routing (2D1490).
  "Ad Hoc Routing", 2003-2005.

Supervision

- Oriol Ros Fornells, *Coexisting wireless sensor networks*. M.Sc. Thesis. KTH, in progress (external advisor).
- Ting Shi, *Inter-network interaction in IEEE 802.15.4 PANs*. M.Sc. Thesis. EIT/KTH, in progress.
- Bilge Cetin, *Design and implementation of relying protocol for multi-rate networks*. M.Sc. Thesis. KTH, 2006.
- Cecilia Jondring and Katerina Stefanidis, *MANETv6 - Mobile Ad hoc Networks with IPv6*. M.Sc. Thesis. KTH, 2000 (external advisor)

Awards

- Best Paper Award. 11th IEEE/IFIP Conf on Wireless On-demand Network Systems and Services (WONS), 2014.
- Scholarship - Santa Fe Institute, Complex Systems Summer School. Funded via US NSF, 2008.
- Research exchange, University of Rome, La Sapienza. Funded via WISENT Coordination Action mobility grant (European Commission), 2006.

Contact: Laura Marie Feeney (lmfeeney@gmail.com)

Publications (full list)

Edited proceedings

- Mark Crovella, Laura Marie Feeney, Dan Rubenstein, and S V Raghavan, editors. *Networking 2010: 9th International IFIP-TC6 Networking Conference. Chennai, India. May 11-15, 2010*, volume 6091 of *LNCS Proceedings Subseries: Computer Communication Networks and Telecommunications*. Springer, 2010.

Invited papers

- Laura Marie Feeney. The technical program for IFIP Networking. *Computer Society of India Communications*, 34(3):6–8, 2010.

- Adam Dunkels, Laura Marie Feeney, Björn Grönvall, and Thiemo Voigt. An integrated approach to developing sensor network solutions. In *2nd Int'l Workshop on Sensor and Actor Network Protocols and Applications (SANPA)*, 2004. Invited paper.

Book chapters

- Laura Marie Feeney. Energy efficient communication in ad hoc wireless networks. In Stefano Basagni, Marco Conti, Silvia Giordano, and Ivan Stojmenovic, editors, *Mobile Ad Hoc Networking*. Wiley, 2004.

Refereed journal articles and conference papers

- Laura Marie Feeney. Toward a better battery model for INET. In *3rd OMNeT++ Community Summit*, 2016. Accepted for publication.

- Laura Marie Feeney and Viktoria Fodor. Reliability in co-located 802.15.4 personal area networks. In *6th ACM Int'l Workshop on Pervasive Wireless Healthcare*, MobiHealth '16, 2016.

- Laura Marie Feeney, Michael Frey, Viktoria Fodor, and Mesut Günes. Modes of inter-network interaction in beacon-enabled IEEE 802.15.4 networks. In *14th IFIP Annual Mediterranean Ad Hoc Networking Workshop (MedHocNet)*, 2015.

- Laura Marie Feeney, Christian Rohner, Per Gunningberg, Anders Lindgren, and Lars Andersson. How do the dynamics of battery discharge affect sensor lifetime? In *11th IEEE/IFIP Conf on Wireless On-demand Network Systems and Services (WONS)*, 2014. Best Paper Award.

- David V. Foster, Mary M. Rorick, Tanja Gesell, Laura M. Feeney, and Jacob G. Foster. Dynamic landscapes: A model of context and contingency in evolution. *Journal of Theoretical Biology*, 334:162 – 172, 2013.

- Christian Rohner, Laura Marie Feeney, and Per Gunningberg. Evaluating battery models in wireless sensor networks. In *11th Int'l Conf. on Wired/Wireless Internet Communications (WWIC)*, 2013.

- Laura Marie Feeney. Towards trustworthy simulation of wireless MAC/PHY layers: A comparison framework. In *15th ACM Int'l Conf. on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM)*, 2012.

- Laura Marie Feeney and Daniel Willkomm. Energy framework: An extensible framework for simulating battery consumption in wireless networks. In *3rd Int'l Workshop on OMNeT++ in conjunction with 3rd Int'l Conf on Simulation Tools and Techniques (Simutools)*, 2010.

- Laura Marie Feeney. Exploring semantic interference in heterogeneous sensor networks. In *1st ACM Workshop on Heterogeneous Sensor and Actor Networks, in conjunction with 9th ACM Int'l Symp. on Mobile Ad Hoc Networking and Computing (MobiHoc)*, 2008.

- Laura Marie Feeney, Bilge Cetin, Daniel Hollos, Holger Karl, Martin Kubisch, and Seble Mengesha. Multirate relaying for performance improvement in IEEE 802.11 WLANs. In *5th Int'l Conf on Wired/Wireless Internet Communications (WWIC)*, 2007.

- Laura Marie Feeney, Christian Rohner, and Bengt Ahlgren. Mobicom poster abstract: Leveraging a power save protocol to improve performance in ad hoc networks. *SIGMOBILE Mob. Comput. Commun. Rev.*, 11(2):51–52, 2007.

- Laura Marie Feeney, Christian Rohner, and Bengt Ahlgren. The impact of wakeup schedule distribution in asynchronous power save protocols on the performance of multihop wireless networks. In *IEEE Wireless Communications and Networking Conf (WCNC)*, 2007.

- Philipp Hurni, Torsten Braun, and Laura Marie Feeney. Simulation and evaluation of unsynchronized power saving mechanisms in wireless ad hoc networks. In *4th Int'l Conf on Wired/Wireless Internet Communications (WWIC)*, 2006.

- Laura Marie Feeney, Daniel Hollos, Holger Karl, Martin Kubisch, and Seble Mengesha. A geometric derivation of the probability of finding a relay in multi-rate networks. In *3rd IFIP Conf on Networking (Networking)*, 2004.

- Laura Marie Feeney, Bengt Ahlgren, Assar Westerlund, and Adam Dunkels. Spontnet: Experiences in configuring and securing small ad hoc networks. In *5th Int'l Workshop on Networked Appliances(IWNA5)*, 2002.

- Laura Marie Feeney. A QoS aware power save protocol for wireless ad hoc networks. In *1st Mediterranean Workshop on Ad Hoc Networks(Med-Hoc Net)*, 2002.

- Laura Marie Feeney, Bengt Ahlgren, and Assar Westerlund. Spontaneous networking: An application-oriented approach to ad hoc networking. *IEEE Communications Magazine*, 39(6):176–181, 2001.

- Laura Marie Feeney. An energy-consumption model for performance analysis of routing protocols for mobile ad hoc networks. *Mobile Networks and Applications Journal*, 6(3):239–250, 2001.

- Laura Marie Feeney and Martin Nilsson. Investigating the energy consumption of a wireless network interface in an ad hoc networking environment. In *IEEE Conf on Computer Communications (Infocom)*, 2001.

- Franco Travostino, Laura Feeney, Philippe Bernadat, and Franklin Reynolds. Building middleware for real-time dependable distributed services. In *1st IEEE Symposium on Object-oriented Real-time Distributed Computing*, 1998.

Posters, demos, and work-in-progress reports (refereed)

- Laura Marie Feeney. Poster abstract: Motivating an inter-networking architecture for WSN/IoT. In *12th Int'l Conf on Mobile Systems, Applications, and Services (MobiSys)*, 2014.

- Laura Marie Feeney, Lars Andersson, Anders Lindgren, Stina Starborg, and Annika Ahlberg Tidblad. Poster abstract: Using batteries wisely. In *ACM Conf. on Embedded Networked Sensor Systems (SenSys)*, 2012.

- Laura Marie Feeney, Lars Andersson, Anders Lindgren, Stina Starborg, and Annika Ahlberg Tidblad. Poster abstract: A testbed for measuring battery discharge behavior. In *7th ACM Int'l Workshop on Wireless Network Testbeds, Experimental Evaluation and Characterization (WiNTECH)*, 2012.

- Laura Marie Feeney. Poster abstract: Self-organizing TDMA for multihop networks. In *19th IEEE Int'l Conf. on Network Protocols (ICNP)*, 2011.

- Laura Marie Feeney. Two simple tools for testing wireless communication modules in OMNeT++. In *4th Int'l Workshop on OMNeT++ in conjunction with 4th Int'l Conf on Simulation Tools and Techniques (Simutools)*, 2011.

- Laura Marie Feeney, Christian Rohner, and Bengt Ahlgren. Mobicom poster abstract: Leveraging a power save protocol to improve performance in ad hoc networks. In *12th Int'l Conf on Mobile Computing and Networking (MobiCom)*, 2006. Also appeared in *ACM* Mobile Computing and Communications Review, April 2007.

- Laura Marie Feeney, Christian Rohner, and Bengt Ahlgren. Poster abstract: Modeling capacity in ad hoc networks. In *9th ACM/IEEE Int'l Symp on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM)*, 2006.

- Laura Marie Feeney, Bengt Ahlgren, Assar Westerlund, and Adam Dunkels. Spontaneous networking for secure collaborative applications in an infrastructureless environment. In *Demonstration Session: Int'l Conf on Pervasive Computing (Pervasive)*, 2002.

- Laura Marie Feeney, Bengt Ahlgren, and Assar Westerlund. Spontaneous and ad hoc networks: Issues and applications. In *Work-in-progress session: 3rd IEEE Workshop on Mobile Computing Systems and Applications (WMCSA)*, 2000.

- Laura Marie Feeney, Franco Travostino, and Philippe Bernadat. Characterizing group communication middleware for real-time dependable distributed systems. In *Work-in-progress session: 18th IEEE Real-time Systems Symposium (RTSS)*, 1997.

- Franco Travostino, Laura Feeney, and Doug Wells. Demonstration of a real-time fault-tolerant distributed application. In *6th IEEE Symposium on High-Performance Distributed Computing (HPDC)*, 1997. Invited demonstration.

National workshops

- Laura Marie Feeney. Inter-network interactions in the internet-of-things: protocol and architecture challenges. In *11th Swedish Nat'l Computer Networking Workshop (SNCNW)*, 2015.

- Laura Marie Feeney. On the consistency of simulation results. In *10th Scandinavian Workshop on Wireless Ad-hocNetworks (AdHoc)*, 2011.

- Laura Marie Feeney. Managing cross layer information in ONNeT++ simulations. In *6th Swedish Nat'l Computer Networking Workshop(SNCNW)*, 2009.

- Laura Marie Feeney. Exploring semantic interference in heterogeneous sensor networks. In *6th Scandinavian Workshop on Wireless Ad Hoc Networks (AdHoc)*, 2008.

- Laura Marie Feeney and Christian Rohner. A model for evaluating asynchronous protocols in ad hoc networks. In *6th Scandinavian Workshop on Wireless Ad Hoc Networks (AdHoc)*, 2006.

- Laura Marie Feeney, Bengt Ahlgren, and Per Gunningberg. Enabling limited traffic scheduling in asynchronous ad hoc networks. In *3rd Swedish Nat'l Computer Networking Workshop (SNCNW)*, 2005.

- Torsten Braun and Laura Marie Feeney. Power saving in wireless ad hoc networks without synchronization. In *5th Scandinavian Workshop on Wireless Ad Hoc Networks (AdHoc)*, 2005.

- Laura Marie Feeney, Daniel Hollos, Holger Karl, Martin Kubisch, and Seble Mengesha. Analysis and protocol design for rate adaptation for simple relay networks. In *4th Scandinavian Workshop on Wireless Ad-hoc Networks (AdHoc)*, 2004.

Technical reports, other

- Laura Feeney, David V Foster, Jacob G Foster, Tanja Gessel, Antony Millner, and Molly Rorick. Dynamic landscapes: a model of context and contingency in evolution. Santa Fe Institute Complex Systems Summer School Project Report (unpublished), 2008.

- Adam Campbell, Laura Feeney, Orion Penner, and Meritxell Vinyalis. Exploring modularity and hierarchy in the NK-landscape. Santa Fe Institute Complex Systems Summer School Project Report (unpublished), 2008.

- Laura Marie Feeney, editor and Can Basaran and others. Critical evaluation of platforms commonly used in embedded wireless sensor networks research. Public report, Embedded Wisents Project FP6-004400, 2006.

- Laura Marie Feeney. Impact of phase distribution in asynchronous communication protocols. Technical Report T2005:15, Swedish Insititute of Computer Science, 2005.

- Rui Campos and others. Scenarios for network composition in ambient networks: a new paradigm for internetworking. In *Wireless World Research Forum (WWRF11)*, 2004.

- Laura Marie Feeney. An asynchronous power save protocol for wireless ad hoc networks. Technical Report T2002:09, SICS – Swedish Institute of Computer Science, 2002. revised February, 2003.

- Laura Marie Feeney. Measuring the energy consumption of an 802.11 network interface. Technical Report T1999:11, SICS – Swedish Institute of Computer Science, 1999.

- Laura Marie Feeney. A taxonomy for routing protocols in mobile ad hoc networks. Technical Report T1999:07, SICS – Swedish Institute of Computer Science, 1999.

Professional Service (full list)

Organizing committees

OMNeT++ Workshop/OMNeT++ Summit: Steering Committee, 2013-date
ACM Conf on Modeling, Analysis & Simulation of Wireless and Mobile Systems (MSWiM):
        Demo/Tools Chair, 2013-2015
OMNeT++ Workshop: Panel co-ordinator, 2015; General co-chair, 2012; Publicity co-chair, 2011
IFIP Networking: TPC co-chair, 2010
WICON Workshop on Wireless Mesh Networks (MeshNets): Executive Committee/Publicity co-chair 2005
IFIP Networking: Publicity co-chair, 2002

Technical Program Committees

OMNeT++ Community Summit, 2016
IFIP Networking, 2016
Winter Simulation Conference, 2015
IFIP Networking, 2015
IEEE Int'l Conf on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), 2015
ACM Int'l Conf on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM), 2014
Int'l Symp on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), 2014
Int'l Conf on Ad Hoc Networks and Wireless (AdHocNow), 2014
IFIP Networking, 2014
Int'l Conf on Mobile Systems and Pervasive Computing (MobiSPC), 2014
Int'l Conf on Heterogeneous Networking for Quality, Reliability, Security and Robustness (Qshine), 2014
IFIP Networking, 2013
IEEE PerCom Workshop on Pervasive Wireless Networking (PWN), 2012
IFIP Networking, 2012
Swedish Nat'l Conf on Networking (SNCNW), 2012
WiOpt Workshop on Wireless Network Measurements (WinMee), 2012
IEEE Int'l Conf on Network Protocols (ICNP), 2011
IFIP Networking, 2011
IEEE Wireless Communications and Networking Conf (WCNC), 2010
IEEE Int'l Conf on Network Protocols (ICNP), 2010
IEEE PerCom Workshop on Pervasive Wireless Networking (PWN), 2010
WiOpt Workshop on Wireless Network Measurements (WinMee), 2010
IFIP Networking, 2009
IEEE PerCom Workshop on Pervasive Wireless Networking (PWN), 2009
Swedish Nat'l Networking Workshop (SNCNW), 2009
IEEE WoWMoM Workshop on Hot Topics in Mesh Networking (HotMesh), 2009
IEEE Mobile Ad Hoc and Sensor Systems (MASS), 2008
IFIP Networking, 2008
IEEE PerCom Workshop on Pervasive Wireless Networking (PWN), 2008
IEEE Mobile Ad Hoc and Sensor Systems (MASS), 2007
IEEE Wireless Communications and Networking Conf (WCNC), 2007
IFIP Networking, 2007
Int'l Conf on Broadband Communications, Networks, and Systems (Broadnets), 2007
IEEE PerCom Workshop on Pervasive Wireless Networking (PWN), 2007
ACM Workshop on Wireless Mobile Applications and Services in WLAN Hotspots (WMASH), 2006
IFIP Conf on Wireless On-demand Network Systems and Services (WONS), 2006
IFIP Networking, 2006
Int'l Conf on Ad Hoc Networks and Wireless (AdHocNow), 2006
IEEE PerCom Workshop on Pervasive Wireless Networking (PWN), 2006
European Workshop on Wireless Sensor Networks (EWSN), 2005
IFIP Conf on Wireless On-demand Network Systems and Services (WONS) 2005
ACM Workshop on Wireless Mobile Applications and Services in WLAN Hotspots (WMASH), 2005
IFIP Networking, 2005
Int'l Conf on Ad Hoc Networks and Wireless (AdHocNow), 2005
IEEE PerCom Workshop on Pervasive Wireless Networking (PWN), 2005

IFIP-TC6 Int'l Conf on Personal Wireless Communications (PWC), 2004
IEEE Mobile Ad Hoc and Sensor Systems (MASS), 2004
IFIP Networking, 2004
Int'l Workshop on Wireless Ad Hoc Networking (WWAN), 2004
IFIP Networking, 2003
IFIP-TC6 Int'l Conf on Personal Wireless Communications (PWC), 2003
IFIP Networking, 2002

Reviewer for

ACM Mobile Computing and Communication Review (MC2R): 2005
ACM Trans. on Sensor Networks: 2012, 2014, 2015
Ad Hoc Networks: 2004, 2005, 2006, 2007, 2008, 2015
BCS Computer Journal: 2004, 2013
Computer Communications: 2009
IEEE/ACM Trans. on Networking: 2004, 2005
IEEE Communcations Letters: 2005
IEEE Communications Magazine: 2004, 2010, 2012, 2013
IEEE Journal on Selected Areas in Communications: 2004 ,2006, 2011
IEEE Pervasive Computing: 2009
IEEE Trans. on Mobile Computing: 2008, 2010, 2012
IEEE Trans. on Parallel and Distributed Systems: 2010
Mobile Networks and Applications (MONET): 2001, 2002
Wireless Networks: 2006, 2007, 2008, 2009, 2012, 2013

Thesis Reviewer for

B. Gleeson. *Power Saving in IEEE 802.11 Wireless Networks.* M.Eng. Thesis, University of Limerick, 2006.
A. Urpi. *A Game Theoretic Model for Ad-hoc Networks.* Ph.D. Thesis, University of Pisa, 2005.