Daniel Smullen

Curriculum Vitae

"Don't have good ideas if you aren't willing to be responsible for them."
—Alan Perlis

Education

Est. 2020 **Doctor of Philosophy (Computer Science, Software Engineering)**, *Carnegie Mellon University*, Pittsburgh, Pennsylvania, Doctoral Candidate.
Institute for Software Research, Advisor: Norman Sadeh

2018 **Master of Science (Software Engineering)**, *Carnegie Mellon University*, Pittsburgh, Pennsylvania.
Institute for Software Research

2014 **Bachelor of Engineering (Software Engineering)**, *University of Ontario Institute of Technology*, Oshawa, Ontario, *Honours with Distinction*.

Academic Work Experience

2014 – Present **Graduate Research Assistant**, *Carnegie Mellon University*, Pittsburgh, Pennsylvania, Institute for Software Research.

2017 – Present **Research Advisor**, *Carnegie Mellon University*, Pittsburgh, Pennsylvania, Institute for Software Research.
Mentor for 3 undergraduate student research programmers, 1 masters student.

2016 **Teaching Assistant**, *Carnegie Mellon University*, Pittsburgh, Pennsylvania, Institute for Software Research.
17-655/17-755: Architectures for Software Systems

2013 – 2014 **Research Associate**, *University of Ontario Institute of Technology*, Oshawa, Ontario.

Software Quality Research Lab, Supervisor: Jeremy Bradbury
- o Investigated privacy in meta-data released unknowingly through Internet traffic, in an ethics board approved user study.
- o Investigated the software testing coupling effect using a variety of mutation testing tools and automation.
- o Research funded by NSERC/CRSNG (Canada).

2013 **Undergraduate Researcher**, *University of Ontario Institute of Technology*, Oshawa, Ontario.

Software Engineering Lab, Supervisor: Ramiro Liscano
- o Studied tinyOS-based wireless sensor networks, applying policy-based programming to create a new development environment (Policy IDE).
- o Developed remote development environments for embedded ubiquitous computing on tinyOS using IPv6.
- o Published and presented work at EUSPN 2013.
- o Presented at UOIT Student Research Showcase 2013.
- o Developed TOSServ and Finger2IPv6 projects (available on Github).
- o Research funded by NSERC/CRSNG (Canada) Undergraduate Student Research Award.

Industrial Work Experience

2015 **334F Affiliate (Radar Science and Instrument Engineering)**, *NASA Jet Propulsion Laboratory*, Pasadena, California.

Supervisor: Razi Ahmed
- o Developed a high-performance distributed radar image processing system.
- o Developed an efficient interferometry filtering algorithm; processing time was reduced from weeks to minutes.
- o Developed a portable implementation for heterogeneous computing platforms at NASA Ames high performance compute cluster (Pleiades) and commodity desktop hardware.
- o Deployed interferometry software in production radar applications for UAVSAR program.

2012 **Engineer in Training**, *SNC-Lavalin Global Information Technologies*, Toronto, Ontario.
- o Conducted reliability study on mission-critical data center systems.
- o Established new guidelines for disaster recovery and emergency response planning.
- o Conducted infrastructure improvement planning study.
- o Developed streamlined workstation staging infrastructure; deployment times reduced from hours to minutes.
- o Developed replacement systems for legacy DOS systems infrastructure.

2011 **Support Technician**, *SNC-Lavalin Global Mining and Metallurgy*, Toronto, Ontario.
- o Provided dedicated technical support for high-value clients and senior executive management.
- o Conducted seminars on computer and network security, repair, open source software, and computer forensics.
- o Developed automated data recovery systems.
- o Performed high-risk data forensics and recovery on destroyed hardware.

2009 **Laboratory Systems Administrator**, *DESSAU, LVM-Technisol*, Toronto, Ontario.
- o Managed migration and replacement of legacy laboratory information management systems.
- o Conducted field work in geotechnical engineering, subsurface sampling, concrete and asphalt QA/QC testing.
- o Performed in-situ quality testing on major airport and highway resurfacing projects.
- o Managed migration and integration of networks and computer systems during LVM-JEGEL company merger.

2009 **Laboratory Systems Administrator**, *John Emery Geotechnical Engineering Limited*, Toronto, Ontario.
- Liaison for City of Toronto special projects.
- Responsible for 2009 Trans-Canada Highway Rehabilitation geoinformatics.
- Responsible for 2009 Toronto Capital Works Program utility location and geotechnical subsurface sampling program.
- Developed ISO 9001 certified laboratory information management software.
- Performed debugging and repair of legacy pavement analysis embedded system software.
- Engineering design and construction of a file storage and database systems data center.

Funded Research Projects

2018 **Internet of Things Privacy Infrastructure (Patent Pending)**, *Carnegie Mellon University*, Pittsburgh, Pennsylvania, Advisor: Norman Sadeh.
Funded by: Defence Advanced Research Projects Agency, National Science Foundation

2017 **A Privacy Assistant for the Internet of Things**, *Carnegie Mellon University*, Pittsburgh, Pennsylvania, Advisor: Norman Sadeh.
Funded by: Defence Advanced Research Projects Agency, National Science Foundation

2017 **Mobile App Privacy Compliance System (Patent Pending)**, *Carnegie Mellon University*, Pittsburgh, Pennsylvania, Advisor: Norman Sadeh.
Funded by: National Science Foundation

2017 **The Usable Privacy Policy Project**, *Carnegie Mellon University*, Pittsburgh, Pennsylvania, Advisor: Norman Sadeh.
Funded by: National Science Foundation

2016 **Eddy: A Privacy Requirements Specification Language**, *Carnegie Mellon University*, Pittsburgh, Pennsylvania, Advisor: Travis Breaux.
Funded by: United States Office of Naval Research, United States Navy Postgraduate School

2015 **Non-local Interferometric Synthetic Aperture Radar Parameter Estimator**, *NASA Jet Propulsion Laboratory*, Pasadena, California, Advisor: Razi Ahmed.
Funded by: National Aeronautics and Space Administration

2014 **Incident Recognition and Intelligence System (IRIS)**, *University of Ontario Institute of Technology*, Oshawa, Ontario, Advisor: Shahryar Rahnamayan.
Funded by: University of Toronto Intelligent Transportation Systems Laboratory, University of Ontario Institute of Technology, NSERC/CRSNG (Canada)

2014 **Automated Marking System (AMS)**, *University of Ontario Institute of Technology*, Oshawa, Ontario, Advisor: Kamran Sartipi.
Funded by: University of Ontario Institute of Technology

2013 **Policy IDE**, *University of Ontario Institute of Technology*, Oshawa, Ontario, Advisor: Ramiro Liscano.
Funded by: NSERC/CRSNG (Canada)

2013 **TOSServ**, *University of Ontario Institute of Technology*, Oshawa, Ontario, Advisor: Ramiro Liscano.
Funded by: NSERC/CRSNG (Canada)

2013 **Finger2IPv6**, *University of Ontario Institute of Technology*, Oshawa, Ontario, Advisor: Ramiro Liscano.
Funded by: NSERC/CRSNG (Canada)

2013 **Military Logistics Management System (MLMS)**, *University of Ontario Institute of Technology*, Oshawa, Ontario, Advisor: Eyhab Al-Masri.
Funded by: University of Ontario Institute of Technology

2012 **sneakyFS File System**, *University of Ontario Institute of Technology*, Oshawa, Ontario, Advisor: Kamran Sartipi.
Funded by: University of Ontario Institute of Technology

2012 **Datacenter Utilization Research Study**, *SNC-Lavalin Global Information Technologies*, Toronto, Ontario, Advisor: Marc Ross.
Funded by: SNC-Lavalin

Refereed Publications

S. Zimmeck, P. Story, D. Smullen, A. Ravichander, Z. Wang, J. Reidenberg, N. C. Russell, and N. Sadeh, "MAPS: Scaling privacy compliance analysis to a million apps," in *PETS '19*, 2019.

P. Story, S. Zimmeck, A. Ravichander, D. Smullen, Z. Wang, J. Reidenberg, N. C. Russell, and N. Sadeh, "Natural language processing for mobile app privacy compliance," *AAAI Spring Symposium on Privacy-Enhancing Artificial Intelligence and Language Technologies*, Mar. 2019.

S. Wilson, N. Sadeh, N. A. Smith, F. Schaub, F. Liu, K. Mysore Sathyendra, D. Smullen, S. Zimmeck, R. Ramanath, P. Story, and F. Liu, "Analyzing privacy policies at scale: From crowdsourcing to automated annotations," *ACM Transactions on the Web*, vol. 13, pp. 1–29, 12 2018.

A. Das, M. Degeling, D. Smullen, and N. M. Sadeh, "Personalized privacy assistants for the internet of things: Providing users with notice and choice," *IEEE Pervasive Computing*, vol. 17, no. 3, pp. 35–46, 2018. [Online]. Available: https://doi.org/10.1109/MPRV.2018.03367733

D. Smullen and T. Breaux, "Improving security in software acquisition with data retention specifications," 2017. [Online]. Available: https://calhoun.nps.edu/handle/10945/58892

J. Bhatia, T. D. Breaux, L. Friedberg, H. Hibshi, and D. Smullen, "Privacy risk in cybersecurity data sharing," in *Proceedings of the 2016 ACM on Workshop on Information Sharing and Collaborative Security, WISCS 2016, Vienna, Austria, October 24 - 28, 2016*, 2016, pp. 57–64. [Online]. Available: http://dl.acm.org/citation.cfm?id=2994541

D. Smullen and T. D. Breaux, "Modeling, analyzing, and consistency checking privacy requirements using eddy," in *Proceedings of the Symposium and Bootcamp on the Science of Security, Pittsburgh, PA, USA, April 19-21, 2016*, 2016, pp. 118–120. [Online]. Available: https://doi.org/10.1145/2898375.2898381

D. Smullen and T. Breaux, "Towards rapid re-certification using formal analysis," 2015. [Online]. Available: https://calhoun.nps.edu/handle/10945/53561

T. D. Breaux, D. Smullen, and H. Hibshi, "Detecting repurposing and over-collection in multi-party privacy requirements specifications," in *23rd IEEE International Requirements Engineering Conference, RE 2015, Ottawa, ON, Canada, August 24-28, 2015*, 2015, pp. 166–175. [Online]. Available: https://doi.org/10.1109/RE.2015.7320419

D. Smullen, J. Gillett, J. Heron, and S. Rahnamayan, "Genetic algorithm with self-adaptive mutation controlled by chromosome similarity," in *Proceedings of the IEEE Congress on Evolutionary Computation, CEC 2014, Beijing, China, July 6-11, 2014*, 2014, pp. 504–511. [Online]. Available: https://doi.org/10.1109/CEC.2014.6900591

N. Qwasmi, D. Smullen, and R. Liscano, "Integrated development environment for debugging policy-based applications in wireless sensor networks," in *The 4th International Conference on Emerging Ubiquitous Systems and Pervasive Networks (EUSPN-2013) and the 3rd International Conference on Current and Future Trends of Information and Communication Technologies in Healthcare (ICTH), Niagara Falls, Ontario, Canada, October 21-24, 2013*, 2013, pp. 225–233. [Online]. Available: https://doi.org/10.1016/j.procs.2013.09.030

Speaking and Professional Service

2018 **Personalized Privacy Assistant Project**, *US Federal Trade Commission PrivacyCon*, Washington D.C., Conference.
o Poster presentation, participated in panel discussions.

2017 **Assisting Users in a World Full of Cameras: A Privacy-aware Infrastructure for Computer Vision Applications**, *US Federal Trade Commission PrivacyCon*, Washington D.C., Conference.
o Poster presentation, participated in panel discussions.

2017 **A Privacy Assistant for the Internet of Things**, *13th Symposium On Usable Privacy and Security (SOUPS 2017)*, San Jose, California, Conference.
o Poster presentation, participated in panel discussions.

2016 **Toward a Semantics for Data Retention in Eddy**, *National Institute of Standards and Technology*, Gaithersburg, Maryland.
o Invited research talk, hosted by NIST Applied Cybersecurity Division.

2015 **Privacy Engineering Tool Clinic**, *Computing Community Consortium Catalyst, Privacy by Design Workshop*, Pittsburgh, Pennsylvania.
o Invited talk, with tool demonstration and discussion panel session.

2015 **Detecting Repurposing and Over-Collection in Multi-party Privacy Requirements Specifications**, *23rd IEEE International Requirements Engineering Conference*, Ottawa, Ontario, Conference.
o Presented conference talk for peer reviewed publication, participated in panel discussions.

2015 **Towards Rapid Re-Certification Using Formal Analysis**, *United States Navy Postgraduate School 12th Annual Acquisition Research Symposium*, Monterey, California, Conference.
o Presented conference talk for peer reviewed publication, participated in panel discussions.

2015 **Web Chair**, *International Conference on Multicore Software Engineering, Performance, and Tools (MUSEPAT 2014)*, Hong Kong, China, Conference.

2014 **Genetic Algorithm with Self-Adaptive Mutation Controlled by Chromosome Similarity**, *IEEE World Congress on Computational Intelligence (WCCI 2014), Evolutionary Computation Conference (CEC 2014)*, Beijing, China, Conference.
o Presented conference talk for peer reviewed publication, participated in panel discussions.

2013 **How Much Do We Reveal Through Metadata? An Assessment of Online Privacy**, *IBM Consortium for Software Engineering Research (CSER 2013)*, Toronto, Ontario, Conference.
o Poster presentation, participated in panel discussions.

2013 **Policy IDE... and lessons learned since**, *The 4th International Conference on Emerging Ubiquitous Systems and Pervasive Networks (EUSPN 2013)*, Niagara Falls, Ontario, Conference.
o Presented conference talk for peer reviewed publication, participated in panel discussions.

2013 **Facilitating the Internet of Things with Policy Programming**, *UOIT Undergraduate Research Showcase*, Oshawa, Ontario, Conference.
o Poster presentation, participated in panel discussions.

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Awards

2017 **Distinguished Poster Award**, *13th Symposium On Usable Privacy and Security (SOUPS 2017)*, San Jose, California.

2017 **Hima and Jive Fellowship in Computer Science for International Students**, *Carnegie Mellon University*, Pittsburgh, Pennsylvania.

2015 **Ready-Set-Transfer Award**, *23rd IEEE International Requirements Engineering Conference*, Ottawa, Ontario, *"Eddy: A privacy requirements specification language"*.
  - Award for 1st place in competitive industrial panel talks.

2014 **Winner, EECS Undergraduate Capstone Design Challenge**, *University of Ontario Institute of Technology*, Oshawa, Ontario, *"Incident Recognition and Intelligence System (IRIS)"*.
  - Capstone research project evaluated by a panel of academic and industrial experts.

2012–2014 **President's Honors List**, *University of Ontario Institute of Technology*, Oshawa, Ontario.
  - Award for exceptional academic achievement, with greater than 3.7 GPA.

2013 **National Science and Engineering Research Council (NSERC) Undergraduate Research Award**, Oshawa, Ontario.
  - Federally funded research award with competitive review process, funding 1 year of undergraduate research in engineering.

2011 **Dean's Honors List**, *University of Ontario Institute of Technology*, Oshawa, Ontario.
  - Award for exceptional academic achievement, with greater than 3.5 GPA.

2008 **Winner, Engineers Without Borders Design Challenge**, *McMaster University*, Hamilton, Ontario.
  - Award for 1st place in competitive software requirements specification competition for distribution of AIDS medication in rural Africa.

2007 **Winner, DaVinci Engineering Design Challenge**, *University of Toronto*, Toronto, Ontario.
  - Award for 1st place in competitive engineering design challenge for remote controlled electric motorized aquatic vehicle design, Electrical Engineering and Fluid Dynamics competition stream.

Languages

English Native Proficiency
French Verbal, Written Proficiency
German Verbal, Written Proficiency

Professional Memberships

2014 **The Corporation of the Seven Wardens**, *Order of the Calling of the Engineer*, Camp 1, Toronto, Ontario.

2013 **Institute of Electrical and Electronics Engineers**, *Student Member*.
  - IEEE Communications Society
  - IEEE Internet of Things
  - IEEE Sensors Council
  - IEEE Software Defined Networks

2011 **International Red Cross**, *Class C Emergency First Aid, CPR and Defibrillator Certification*.

2009 **Burlington Rifle and Revolver Club**, *Range Officer and Instructor*.