Shane McIntosh

Curriculum Vitae

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: shane.mcintosh@mcgill.ca : http://shanemcintosh.org/

SUMMARY OF ACCOMPLISHMENTS

- Recipient of the Governor General's Academic Gold Medal—one of Canada's most prestigious awards for PhD graduates (see AWARDS & RECOGNITION).
- My early papers on build systems laid the groundwork for a rapidly-growing research community that has piqued industrial interest (see ICSE'11, EMSE'12, and MSR'10).
- Broad network of collaborators, including industrial researchers from institutions in Germany and USA, as well as academics from institutions in Japan, Brazil, and Canada.

PAPERS IN REFEREED INTERNATIONAL JOURNALS

TSE'16a D. A. da Costa, S. McIntosh, W. Shang, U. Kulesza, R. Coelho, A. E. Hassan. A Framework for Evaluating the Results of the SZZ Approach for Identifying Bug-Introducing Changes. *Transactions on Software Engineering* (IEEE), Accepted (Oct. 2016), 18 pages.

EMSE'16a P. Thongtanunam, S. McIntosh, A. E. Hassan, H. Iida. Review Participation in Modern Code Review: An Empirical Study of the Android, Qt, and OpenStack Projects. *Empirical Software Engineering* (Springer), Accepted (Aug. 2016), 40 pages.

TSE'16b F. Zhang, A. E. Hassan, S. McIntosh, Ying Zou. The Use of Summation to Aggregate Software Metrics Hinders the Performance of Defect Prediction Models. *Transactions on Software Engineering* (IEEE), In press (Aug. 2016), 16 pages.

TSE'16c C. Tantithamthavorn, S. McIntosh, A. E. Hassan, K. Matsumoto. An Empirical Comparison of Model Validation Techniques for Defect Prediction Models. *Transactions on Software Engineering* (IEEE), In press (Jun. 2016), 21 pages.

TSE'16d C. Tantithamthavorn, S. McIntosh, A. E. Hassan, K. Matsumoto. Comments on "Researcher Bias: The Use of Machine Learning in Software Defect Prediction" *Transactions on Software Engineering* (IEEE), In press (Apr. 2016), 5 pages.

AUSE'16 S. McIntosh, B. Adams, M. Nagappan, A. E. Hassan. Identifying and Understanding Header File Hotspots in C/C++ Build Processes. *Automated Software Engineering* (Springer), 23(4):619–647, Dec. 2016.

EMSE'16b Y. Kamei, T. Fukushima, S. McIntosh, K. Yamashita, N. Ubayashi, A. E. Hassan. Studying Just-In-Time Defect Prediction using Cross-Project Models. *Empirical Software Engineering* (Springer), 21(5):2072–2106, Oct. 2016.

EMSE'16c S. McIntosh, Y. Kamei, B. Adams, A. E. Hassan. An Empirical Study of the Impact of Modern Code Review Practices on Software Quality. *Empirical Software Engineering* (Springer), 21(5):2146–2189, Oct. 2016.

EMSE'15 S. McIntosh, M. Nagappan, B. Adams, A. Mockus, A. E. Hassan. A Large-Scale Empirical Study of the Relationship between Build Technology and Build Maintenance. *Empirical Software Engineering* (Springer), 20(6):1587–1633, Dec. 2015.

EMSE'12 S. McIntosh, B. Adams, A. E. Hassan. The evolution of Java build systems. *Empirical Software Engineering* (Springer), 17(4-5):578–608, Aug. 2012.

FULL PAPERS IN REFEREED INTERNATIONAL CONFERENCE PROCEEDINGS

ICSME'16 J. Shimagaki, Y. Kamei, S. McIntosh, D. Pursehouse, N. Ubayashi. Why are Commits being Reverted? A Comparative Study of Industrial and Open Source Projects. *In proc. of the 32nd Int'l Conf. on Software Maintenance and Evolution* (IEEE), In press (Aug. 2016), 11 pages. Acceptance rate: 35/127 or 29%.

ESEM'16 K. Miura, S. McIntosh, Y. Kamei, A. E. Hassan, N. Ubayashi. The Impact of Task Granularity on Co-evolution Analyses. *In proc. of the 10th Int'l Symposium on Empirical Software Engineering and Measurement* (ACM/IEEE), pp. 47:1–47:10, Sep. 2016. Acceptance rate: 27/122 or 22%.

ICSE'16a P. Thongtanunam, S. McIntosh, A. E. Hassan, H. Iida. Revisiting Code Ownership and its Relationship with Software Quality in the Scope of Modern Code Review. *In proc. of the 38th Int'l Conf. on Software Engineering* (ACM/IEEE), pp. 1039–1050, May 2016. Acceptance rate: 101/530 or 19%.

ICSE'16b C. Tantithamthavorn, S. McIntosh, A. E. Hassan, K. Matsumoto. Automated Parameter Optimization of Classification Techniques for Defect Prediction Models. *In proc. of the 38th Int'l Conf. on Software Engineering* (ACM/IEEE), pp. 321–332, May 2016. Acceptance rate: 101/530 or 19%.

ICSE'16 SEIP J. Shimagaki, Y. Kamei, S. McIntosh, A. E. Hassan, N. Ubayashi. A Study of the Quality-Impacting Practices of Modern Code Review at Sony Mobile. *In proc. of the Software Engineering in Practice (SEIP) track of the 38th Int'l Conf. on Software Engineering* (ACM/IEEE), pp. 212–221, May 2016. Acceptance rate: 28/108 or 26%.

MSR'16a D. A. da Costa, S. McIntosh, U. Kulesza, A. E. Hassan. Studying the Impact of Switching to a Rapid Release Cycle on Integration Delay of Addressed Issues: An Empirical Study of the Mozilla Firefox Project. *In proc. of the 13th Int'l Conf. on Mining Software Repositories* (ACM/IEEE), pp. 374–385, May 2016. Acceptance rate: 36/103 or 35%.
🏆 *ACM SIGSOFT distinguished paper* 🏆

SANER'16a M. Beller, R. Bholanath, S. McIntosh, A. Zaidman. Analyzing the State of Static Analysis: A Large-Scale Evaluation in Open Source Software. *In proc. of the 23rd Int'l Conf. on Software Analysis, Evolution, and Reengineering* (IEEE), pp. 470–481, Mar. 2016. Acceptance rate: 52/140 or 37%.

SANER'16b C. Macho, S. McIntosh, M. Pinzger. Predicting Build Co-Changes with Source Code Change and Commit Categories. *In proc. of the 23rd Int'l Conf. on Software Analysis, Evolution, and Reengineering* (IEEE), pp. 541–551, Mar. 2016. Acceptance rate: 52/140 or 37%.
🏆 *Nominated for best paper* 🏆

ESEC/FSE'15 M. Nagappan, R. Robbes, Y. Kamei, É. Tanter, S. McIntosh, A. Mockus, A. E. Hassan. An Empirical Study of goto in C Code from GitHub Repositories. *In proc. of the 10th joint meeting of the European Software Engineering Conference and the Symposium on the Foundations of Software Engineering* (ACM/IEEE), pp. 404–414, Sep. 2015. Acceptance rate: 74/291 or 25%.

ICSE'15a C. Tantithamthavorn, S. McIntosh, A. E. Hassan, A. Ihara, K. Matsumoto. The Impact of Mislabelling on the Performance and Interpretation of Defect Prediction Models *In proc. of the 37th Int'l Conf. on Software Engineering* (ACM/IEEE), pp. 812–823, May 2015. Acceptance rate: 84/452 or 19%.

ICSE'15b B. Ghotra, S. McIntosh, A. E. Hassan. Revisiting the Impact of Classification Techniques on the Performance of Defect Prediction Models. *In proc. of the 37th Int'l Conf. on Software Engineering* (ACM/IEEE), pp. 789–800, May 2015. Acceptance rate: 84/452 or 19%.

MSR'15 P. Thongtanunam, S. McIntosh, A. E. Hassan, H. Iida. Investigating Code Review Practices in Defective Files. *In proc. of the 12th Working Conf. on Mining Software Repositories* (ACM/IEEE), pp. 168–179, May 2015. Acceptance rate: 32/106 or 30%.

SANER'15a R. Morales, S. McIntosh, F. Khomh. Do Code Review Practices Impact Design Quality? A Case Study of the Qt, VTK, and ITK Projects. *In proc. of the 22nd Int'l Conf. on Software Analysis, Evolution, and Reengineering* (IEEE), pp. 171–180, Mar. 2015. Acceptance rate: 46/144 or 32%.

SANER'15b X. Xia, D. Lo, S. McIntosh, E. Shihab, A. E. Hassan. Cross-Project Build Co-change Prediction. *In proc. of the 22nd Int'l Conf. on Software Analysis, Evolution, and Reengineering* (IEEE), pp. 311–320, Mar. 2015. Acceptance rate: 46/144 or 32%.

ICSME'14a S. McIntosh, B. Adams, M. Nagappan, A. E. Hassan. Mining Co-Change Information to Understand when Build Changes are Necessary. *In proc. of the 30th Int'l Conf. on Software Maintenance and Evolution* (IEEE), pp. 241–250, Oct. 2014. Acceptance rate: 40/210 or 19%.

ICSME'14b D. A. da Costa, S. L. Abebe, S. McIntosh, Uirá Kulesza, A. E. Hassan. An Empirical Study of Delays in the Integration of Addressed Issues *In proc. of the 30th Int'l Conf. on Software Maintenance and Evolution* (IEEE), pp. 281–290, Oct. 2014. Acceptance rate: 40/210 or 19%.
🏆 *Nominated for best paper* 🏆

ASE'14 S. van der Burg, E. Dolstra, S. McIntosh, J. Davies, D. M. Germán, A. Hemel. Tracing Software Build Processes to Uncover License Compliance Inconsistencies. *In proc. of the 29th Int'l Conf. on Automated Software Engineering* (ACM/IEEE), pp. 731–741, Sep. 2014. Acceptance rate: 55/276 or 20%.

ICSE'14 SEIP S. McIntosh, M. Poehlmann, E. Juergens, A. Mockus, B. Adams, A. E. Hassan, B. Haupt, C. Wagner. Collecting and Leveraging a Benchmark of Build System Clones to Aid in Quality Assessments. *In proc. of the Software Engineering in Practice (SEIP) track of the 36th Int'l Conf. on Software Engineering* (ACM/IEEE), pp. 145–154, Jun. 2014. Acceptance rate: 25/117 or 21%.

MSR'14a S. McIntosh, Y. Kamei, B. Adams, A. E. Hassan. The Impact of Code Review Coverage and Code Review Participation on Software Quality: A Case Study of the Qt, VTK, and ITK Projects. *In proc. of the 11th Working Conf. on Mining Software Repositories* (ACM/IEEE), pp. 192–201, May 2014. Acceptance rate: 29/85 or 34%.
🏆 *Distinguished paper award* 🏆

MSR'14b T. Fukushima, Y. Kamei, S. McIntosh, K. Yamashita, N. Ubayashi. An Empirical Study of Just-In-Time Defect Prediction Using Cross-Project Models. *In proc. of the 11th Working Conf. on Mining Software Repositories* (ACM/IEEE), pp. 172–181, May 2014. Acceptance rate: 29/85 or 34%.
🏆 *Nominated for distinguished paper award* 🏆

WSE'11 S. McIntosh, B. Adams, A. E. Hassan, Ying Zou. Using Indexed Sequence Diagrams to Uncover the Behaviour of AJAX Applications. *In proc. of the 13th Int'l Symposium on Web Systems Evolution* (IEEE), pp. 1–10, Sep. 2011. Acceptance rate: 8/24 or 33%.

ICSE'11 S. McIntosh, B. Adams, T. H. D. Nguyen, Y. Kamei, A. E. Hassan. An Empirical Study of Build Maintenance Effort. *In proc. of the 33rd Int'l Conf. on Software Engineering* (ACM/IEEE), pp. 141–150, May 2011. Acceptance rate: 62/441 or 14%.

MSR'10 S. McIntosh, B. Adams, A. E. Hassan. The Evolution of ANT Build Systems. *In proc. of the 7th Working Conf. on Mining Software Repositories* (ACM/IEEE), pp. 42–51, May 2010. Acceptance rate: 16/51 or 31%.
🏆 *Nominated for best paper award* 🏆

SHORT PAPERS IN REFEREED INTERNATIONAL CONFERENCE PROCEEDINGS

MSR'16a Challenge J. G. Barnett, C. K. Gathuru, L. S. Soldano, S. McIntosh. The Relationship between Commit Message Detail and Defect Proneness in Java Projects on GitHub. *In proc. of the Mining Challenge track of the 13th Working Conf. on Mining Software Repositories* (ACM/IEEE), pp. 496–499, May 2016. Acceptance rate: 10/24 or 42%.
🏆 *Mining challenge runner-up* 🏆

MSR'16b Challenge C. Désarmeaux, A. Pecatikov, S. McIntosh. The Dispersion of Build Maintenance Activity across Maven Lifecycle Phases. *In proc. of the Mining Challenge track of the 13th Working Conf. on Mining Software Repositories* (ACM/IEEE), pp. 492–495, May 2016. Acceptance rate: 10/24 or 42%.

MSR'14 Challenge K. Yamashita, S. McIntosh, Y. Kamei, N. Ubayashi. Magnet or Sticky? An OSS Project-by-Project Typology. *In proc. of the Mining Challenge track of the 11th Working Conf. on Mining Software Repositories* (ACM/IEEE), pp. 344–347, May 2014. Acceptance rate: 9/19 or 47%.

CSMR-WCRE'14 ERA S. McIntosh, K. Legere, A. E. Hassan. Orchestrating Change: An Artistic Representation of Software Evolution. *In proc. of the Early Research Achievements (ERA) track of the 1st joint meeting of the Conf. on Software Maintenance and Reengineering and the Working Conf. on Reverse Engineering* (IEEE), pp. 353–357, Mar. 2014. Acceptance rate: 12/33 or 36%.

NOTABLE INVITED PAPERS AND TALKS

SANER'16 FOSE B. Adams, S. McIntosh. Modern Release Engineering in a Nutshell: Why Researchers should Care. *In proc. of the Future of Software Engineering (FOSE) track of the 23rd Int'l Conf. on Software Analysis, Evolution, and Reengineering* (IEEE), pp. 78–90, May 2016. *Invited paper*.

COW'15 S. McIntosh. Building on an Unsound Foundation: How Release Pipelines can Impact our Predictive Models. *44th CREST Open Workshop, Predictive Modelling for Software Engineering*, UCL, London, UK, Nov. 2015.

GERRIT'15 S. McIntosh. Mining Gerrit Repositories to Study the Impact of Modern Code Review Practices *Gerrit User Summit*, Mountain View, USA, Nov. 2015.

FOSDEM'14 S. McIntosh, B. Adams, M. Nagappan, A. E. Hassan. Identifying Hotspots in Software Build Processes. *Free and Open Source Developers European Meeting*, Belgium, Feb. 2014.

AWARDS & RECOGNITION

- **Peter Silvester Faculty Research Award**. October 2016.
  Dept. of Electrical and Computer Engineering, McGill University.
- **Governor General's Academic Gold Medal**. June 2016.
  `https://www.gg.ca/document.aspx?id=15008`
- **Vanier Canada Graduate Scholarship**. Sep. 2012–Aug. 2015.
  `http://vanier.gc.ca/`

ACADEMIC SERVICE

Program Committee Chair

- Int'l Workshop on Release Engineering (RELENG'16)
- Int'l Workshop on Empirical Software Engineering in Practice (IWESEP'16)

Program Committee

- Int'l Conf. on Software Maintenance and Evolution (ICSME'17)
- Int'l Conf. on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA'17)
- Int'l Conf. on Mining Software Repositories (MSR'17)
- Int'l Conf. on Evaluation and Assessment in Software Engineering (EASE'17)
- Int'l Workshop on Empirical Software Engineering in Practice (IWESEP'17)
- Int'l Workshop on SoftWare ANalytics (SWAN'16)
- Int'l Conf. on Data Science and Advanced Analytics (DSAA'16)
- Int'l Conf. on Software Maintenance and Evolution (ICSME'16)
- Working Conf. on Mining Software Repositories (MSR'16)
- Int'l Workshop on Empirical Software Engineering in Practice (IWESEP'14)

Formal Tool Demonstrations Committee

- Int'l Symposium on the Foundations of Software Engineering (FSE'17)
- Int'l Conf. on Program Comprehension (ICPC'16)
- Int'l Conf. on Software Analysis, Evolution, and Reengineering (SANER'16)
- Int'l Conf. on Program Comprehension (ICPC'15)
- Int'l Conf. on Software Maintenance and Evolution (ICSME'14)
- Int'l Conf. on Program Comprehension (ICPC'14)

Artifact Evaluation Committee

- Int'l Symposium on the Foundations of Software Engineering (FSE'14)

Mining Challenge Committee

- Working Conf. on Mining Software Repositories (MSR'15)

Data Showcase Committee
- Working Conf. on Mining Software Repositories (MSR'16)
- Working Conf. on Mining Software Repositories (MSR'15)
- Working Conf. on Mining Software Repositories (MSR'13)

Reviewer
- Transactions on Software Engineering (TSE)
- Empirical Software Engineering (EMSE)
- IEEE Software
- Journal of Software and Systems (JSS)
- Journal of Information and Software Technology (IST)
- Public Library of Science ONE Journal (PLOS ONE)

RESEARCH EXPERIENCE

Assistant Professor
- **Dept. of Electrical and Computer Engineering, McGill University, Canada**
  August 2015 - Present

Visiting Researcher
- **Principles Of Software Languages (POSL) Lab, Kyushu University, Fukuoka, Japan**
  Description: Two month-long fully-funded visits to work with a research team in Japan
  October 2013 - November 2013; October 2014 - November 2014

MENTORING & TEACHING EXPERIENCE

Doctoral Students
- K. Gallaba (September 2016 - Present)
- K. Yamashita (September 2013 - Present)
  Co-advised with Y. Kamei
  Co-authored papers: EMSE'15a, IWPSE'15, MSR'14b, MSR'14c
- D. A. da Costa (February 2014 - Present)
  Co-advised with Uirá Kulesza
  Co-authored papers: TSE'16a, MSR'16a, ICSME'14b
- C. Tantithamthavorn (June 2014 - September 2016)
  Co-advised with A. E. Hassan
  Co-authored papers: ICSE'16b, TSE'16c, TSE'16d, ICSE'15a
  Most recent position: Postdoc at Queen's University
- P. Thongtanunam (August 2014 - September 2016)
  Co-advised with A. E. Hassan
  Co-authored papers: ICSE'16a, MSR'15, EMSE'16a
  Most recent position: Postdoc at Queen's University

Master's Students
- R. Wen (September 2016 - Present)
- T. Fukushima (September 2013 - March 2015)
  Co-advised with Y. Kamei
  Co-authored papers: EMSE'16a, MSR'14b
- B. Ghotra (January 2014 - Present)
  Co-advised with A. E. Hassan
  Co-authored papers: ICSE'15b

Course Instructor
- ECSE 611: Software Analytics (Winter 2017)
- ECSE 321: Introduction to Software Engineering (Fall 2015, Fall 2016)

INDUSTRIAL EXPERIENCE

Software Engineer
EMC^2 Corporation, Backup and Recovery Services, Canada
September 2010 - August 2012, January 2009 - August 2009, September 2007 - April 2008

Projects that I led:

- Improved an aging software build system comprised of more than 200,000 lines of build logic, which reduced the time consumed by a typical build by a factor of ten.
- Migration to a modern version control system, which allowed developers to maintain local branches and collaborate more effectively.

EDUCATION

Doctor of Philosophy (PhD)
🏆 *Governor General's Academic Gold Medal* 🏆
Queen's University, Canada
September 2012 - July 2015
Thesis Title: "Studying the Software Development Overhead of Build Systems"
Supervisors: A. E. Hassan and B. Adams

Master of Science (MSc)
🏆 *Distinguished thesis award* 🏆
Queen's University, Canada
September 2009 - January 2011
Thesis Title: "Studying the Evolution of Build Systems"
Supervisors: A. E. Hassan and B. Adams

Bachelor of Applied Computing (BAComp)
University of Guelph, Canada
September 2003 - December 2008
Thesis Title: "Robotic Search in a Partially-Known Physical Environment"
Supervisor: Michael Liu