

Nicholas A. Kraft

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Technical Research Interests

Software maintenance and evolution, program comprehension, software repository mining, and end-user software engineering.

Educational Research Interests

Improving motivation, self-efficacy, and critical thinking using student-centered learning approaches such as guided-discovery learning and experiential learning.

Education

Clemson University, Clemson, South Carolina, USA

PhD Computer Science, May 2007

Dissertation: *An Infrastructure to Support Interoperability in Reverse Engineering*

Advisor: Brian A. Malloy

Indiana University Southeast, New Albany, Indiana, USA

BA Mathematics, May 2002

Professional Experience

ABB Corporate Research, Raleigh, North Carolina, USA

May 2018–

University Relations Program Manager for USCRC

June 2017–

Lead Principal Scientist

June 2014–May 2017

Principal Scientist

Department of Computer Science, The University of Alabama, Tuscaloosa, Alabama, USA

August 2013–May 2014

Associate Professor (with tenure)

August 2007–August 2013

Assistant Professor

School of Computing, Clemson University, Clemson, South Carolina, USA

January 2007–May 2007

Graduate Assistant (Unix Systems Administrator)

August 2006–December 2006

Graduate Instructor

January 2003–August 2006

Graduate Assistant (Unix Systems Administrator)

August 2002–December 2002

Graduate Teaching Assistant

Student Development Center, Indiana University Southeast, New Albany, Indiana, USA

January 2002–May 2002

Supplemental Instructor (SI Leader)

Sponsored Research

Dr. Kraft has served as PI or co-PI on approximately \$2.4M in grants from NSF, DARPA, and ED.

External Awards (9)

DARPA FA8750-16-2-0288

“Mining Developer Communications to Create a Web-Scale Repository of Documented and Analyzable Code Snippets,” *Mining and Understanding Software Enclaves (MUSE)*, 10/01/16–02/28/18, \$535,001 (ABB Share: \$345,001), N.A. Kraft (PI), V. Augustine, K. Damevski (PI at VCU), L. Pollock, D. Shepherd.

NSF 1559593

“REU Site: Science of Software,” *Research Experiences for Undergraduates Sites*, 02/01/16–01/31/19, \$355,365, N.A. Kraft (Unfunded Collaborator¹), C. Parnin (PI), S. Heckman, T. Menzies, E. Murphy-Hill, K. Stolee, L. Williams.

NSF 1305395

“CI-P: Advanced Systematic Literature Review Infrastructure for Software Engineering,” *Computing Research Infrastructure*, 10/01/13–09/30/15, \$100,000, N.A. Kraft (co-PI — 40%), J.C. Carver (PI), D. Hale.

NSF 1156563

“REU Site: Empirical Software Engineering,” *Research Experiences for Undergraduates Sites*, 02/01/12–01/31/15, \$333,000, N.A. Kraft (PI — 67%), J.C. Carver.

ED P200A100182

“Doctoral Fellowships in Computer Science: Next-Generation Science and Practice of Software Engineering,” *Graduate Assistance in Areas of National Need*, 08/16/10–08/15/13, \$525,060, N.A. Kraft (co-PI — 24%), S. Vrbsky (PI), J.C. Carver, D. Cordes, J. Gray, J.C. Lusth, A. Parrish, R.K. Smith.

NSF 0941992

“Text-to-Art,” *EHR/DUE CCLI-Type 1 (Exploratory)*, 07/01/10–06/30/12, \$100,000, N.A. Kraft (PI — 50%), J.C. Lusth.

NSF 0915559 & 0915403

“SHF:Small:Collaborative Research: Improved Code Clone Categorization,” *CISE/CCF Software and Hardware Foundations*, 09/15/09–09/14/12, \$494,054 (UA Share: \$360,812), N.A. Kraft (Overall PI — 50%), L.H. Etzkorn (PI at UAHuntsville), J.C. Carver.

NSF 0851824

“REU Site: Software Language Engineering,” *Research Experiences for Undergraduates Sites*, 08/01/09–07/31/12, \$306,111, N.A. Kraft (PI — 95%), A. Parrish.

¹ Dr. Kraft contributed to the proposal and mentored REU Site participants.

NSF 0837210

“100P: A Guided Discovery Curriculum for Computer Science,” *EHR/DUE CCLI-Phase 1 (Exploratory)*, 05/01/09–04/30/11, \$98,286, N.A. Kraft (co-PI — 33%), J.C. Lusth (PI), X. Hong.

Internal Awards

UA Offices of Academic Affairs and Research

“Postdoctoral Research Fellow in Software Engineering,” *Research Stimulation Program*, 06/01/10–05/31/12, ≈\$90,000, N.A. Kraft (co-PI — 25%), J.C. Carver, J. Gray, R.K. Smith.

Publications

Graduate student authors[◊] and undergraduate student authors[★] are noted.

Refereed Journal Articles (18)

- [1] Z. Yu[◊], N.A. Kraft, T. Menzies, “Finding Better Active Learners for Faster Literature Reviews,” *Empirical Software Engineering*, 2018, doi: 10.1007/s10664-017-9587-0
- [2] K. Damevski, H. Chen, D.C. Shepherd, N.A. Kraft, L. Pollock, “Predicting Future Developer Behavior in the IDE Using Topic Models,” *IEEE Transactions on Software Engineering*, 2017, doi: 10.1109/TSE.2017.2748134
- [3] B.P. Eddy, N.A. Kraft, and J. Gray, “Impact of Structural Weighting on a Latent Dirichlet Allocation Based Feature Location Technique,” *Journal of Software: Evolution and Process*, 2017, doi: 10.1002/smr.1892
- [4] P.W. McBurney, S. Jiang[◊], M. Kessentini, N.A. Kraft, A. Armaly[◊], W. Mkaouer, and C. McMillan, “Towards Prioritizing Documentation Effort,” *IEEE Transactions on Software Engineering*, 2017, doi: 10.1109/TSE.2017.2716950
- [5] D. Chatterji[◊], J.C. Carver, and N.A. Kraft, “Code Clones and Developer Behavior: Results of Two Surveys of the Clone Research Community,” *Empirical Software Engineering*, 2016, doi: 10.1007/s10664-015-9394-4
- [6] L.R. Biggers[◊], C. Bocovich[★], R. Capshaw[★], B.P. Eddy[◊], L.H. Etzkorn, and N.A. Kraft, “Configuring latent Dirichlet allocation based feature location,” *Empirical Software Engineering*, 2014, doi: 10.1007/s10664-012-9224-x
- [7] J.R. Pate[◊], R. Tairas[◊], and N.A. Kraft, “Clone evolution: a systematic review,” *Journal of Software: Evolution and Process*, 25(3): 261–283, March 2013.
- [8] L. Ding[◊], D. Steil, B. Dixon, N.A. Kraft, D.B. Brown, A. Parrish, “FIRST: Framework to Integrate Relationship Search Tools,” *International Journal of Computers and Applications*, 2013, doi: 10.2316/Journal.202.2013.3.202-3609

- [9] F. Jacob[◊], S. Yue[◊], J. Gray, and N.A. Kraft, “Modulo-F: A Modularization Language for FORTRAN Programs,” *Journal of Convergence Information Technology*, 7(12): 256–263, 2012.
- [10] P. Shao[◊], T. Atkison, N.A. Kraft, and R.K. Smith, “Combining lexical and structural information for static bug localization,” *International Journal of Computer Applications in Technology*, 44(1): 61–71, 2012.
- [11] J. Durand[◊], J. Flores[◊], T. Atkison, N.A. Kraft, and R.K. Smith, “Using Executable Slicing to Improve Rogue Software Detection Algorithms,” *International Journal of Secure Software Engineering*, 2(2): 53–64, April–June 2011.
- [12] D.A. Steil[◊], J.R. Pate[◊], N.A. Kraft, R.K. Smith, B. Dixon, L. Ding[◊], and A. Parrish, “Patrol Routing Expression, Execution, Evaluation, and Engagement,” *IEEE Transactions on Intelligent Transportation Systems*, 12(1): 58–72, March 2011.
- [13] S.K. Lukins[◊], N.A. Kraft, and L.H. Etzkorn, “Bug localization using latent Dirichlet allocation,” *Information and Software Technology*, 52(9): 972–990, September 2010.
- [14] N.A. Kraft, E.B. Duffy[◊], and B.A. Malloy, “Grammar Recovery from Parse Trees and Metrics-Guided Grammar Refactoring,” *IEEE Transactions on Software Engineering*, 35(6): 780–794, November / December 2009.
- [15] G. Jay[◊], J. Hale, R.K. Smith, D. Hale, N.A. Kraft, and C. Ward[◊], “Cyclomatic Complexity and Lines of Code: Empirical Evidence of a Stable Linear Relationship,” *Journal of Software Engineering and Applications*, 2(3): 137–143, October 2009.
- [16] N.A. Kraft, B.A. Malloy, and J.F. Power, “A tool chain for reverse engineering C++ applications,” *Science of Computer Programming (Special Issue on Experimental Software and Toolkits)*, 69(1–3): 3–13, December 2007.
- [17] N.A. Kraft, B.A. Malloy, and J.F. Power, “An infrastructure to support interoperability in reverse engineering,” *Information and Software Technology*, 49(3): 292–307, March 2007.
Special issue containing the best papers from the 12th Working Conf. on Reverse Engineering (WCRE’05). Extensive revision and expansion of the conference paper.
- [18] N.A. Kraft, E.L. Lloyd, B.A. Malloy, and P.J. Clarke, “The implementation of an extensible system for comparison and visualization of class ordering methodologies,” *Journal of Systems and Software*, 79(8): 1092–1109, August 2006.

Refereed Conference and Workshop Proceedings (52)

- [1] M.J. Decker, C.D. Newman, N. Dragan, M.L. Collard, J.I. Maletic, and N.A. Kraft, “Which Method Stereotype Changes are Indicators of Code Smells?,” *Proc. 18th IEEE Int’l Working Conference on Source Code Analysis and Manipulation (SCAM’18)*, Madrid, Spain, 10 pp., September 2018.

- [2] A. Ciborowska[⊙], N.A. Kraft, and K. Damevski, "Detecting and Characterizing Developer Behavior Following Opportunistic Reuse of Code Snippets from the Web," *Proc. 15th Int'l Conference on Mining Software Repositories (MSR'18) — Mining Challenge*, Gothenburg, Sweden, 4 pp., May 2018. **Winner, Best Mining Challenge.**
- [3] J. Smith[⊙], J.A. Middleton[⊙], and N.A. Kraft, "Spreadsheet Practices and Challenges in a Large Multinational Conglomerate," *Proc. IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC'17)*, Raleigh, NC, USA, 10 pp., October 2017 [acceptance rate: 29%].
- [4] Z. Coker[⊙], K. Damevski, C. LeGoues, N.A. Kraft, D. Shepherd, and L. Pollock, "Behavior Metrics for Prioritizing Investigations of Exceptions," *Proc. 33rd IEEE Int'l Conference on Software Maintenance and Evolution (ICSME'17) — Industry Track*, Shanghai, China, 10 pp., September 2017.
- [5] M. Zuger[⊙], C.S. Corley[⊙], A.N. Meyer[⊙], B. Li[⊙], T. Fritz, D. Shepherd, V. Augustine, P. Francis, N.A. Kraft, W. Snipes, "Reducing Interruptions at Work: A Large-Scale Field Study of FlowLight," *Proc. 35th ACM CHI Conference on Human Factors in Computing Systems (CHI'17)*, Denver, CO, USA, 12 pp., May 2017. **Honorable Mention Award (top 5% of all submissions).**
- [6] P. Chatterjee[⊙], M.A. Nishi[⊙], K. Damevski, V. Augustine, L. Pollock, N.A. Kraft, "What Information about Code Snippets Is Available in Different Software-Related Documents? An Exploratory Study," *Proc. 24th IEEE Int'l Conf. on Software Analysis, Evolution, and Reengineering (SANER'17)*, Klagenfurt, Austria, 5 pp., February 2017 [acceptance rate: 37%].
- [7] J. Carver, O. Dieste, N.A. Kraft, D. Lo, and T. Zimmermann, "How Practitioners Perceive the Relevance of ESEM Research," *Proc. 10th ACM/IEEE Int'l Sym. on Empirical Software Engineering and Measurement (ESEM'16)*, Ciudad Real, Spain, pp. 56:1–56:10, September 2016 [acceptance rate: 22%].
- [8] V. Singh[⊙], L. Pollock, W. Snipes, and N.A. Kraft, "A Case Study of Program Comprehension Effort and Technical Debt Estimations," *Proc. 24th IEEE Int'l Conf. on Program Comprehension (ICPC'16)*, Austin, TX, USA, pp. 1–9, May 2016 [acceptance rate: 30%].
- [9] M. Acharya, C. Parnin, N.A. Kraft, A. Dagnino, X. Qu, "Code Drones," *Proc. 38th ACM/IEEE International Conference on Software Engineering (ICSE'16)*, Austin, TX, USA, pp. 785–788, May 2016. **Second Prize, Visions of 2025 and Beyond.**
- [10] B. Li[⊙], C. Vendome[⊙], M. Linares-Vasquez[⊙], D. Poshyvanyk, and N.A. Kraft, "Automatically Documenting Unit Test Cases," *Proc. 9th IEEE Int'l Conf. on Software Testing, Verification, and Validation (ICST'16)*, Chicago, IL, USA, pp. 341–352, April 2016 [acceptance rate: 27%].
- [11] C.S. Corley[⊙], K.L. Kashuda[★], and N.A. Kraft, "Modeling Changeset Topics for Feature Location," *Proc. 31st IEEE Int'l Conf. on Software Maintenance and Evolution (ICSME'15)*, Bremen, Germany, pp. 71–80, September/October 2015 [acceptance rate: 21%].

- [12] C.S. Corley[⊙], K. Damevski, and N.A. Kraft, "Exploring the Use of Deep Learning for Feature Location," *Proc. 31st IEEE Int'l Conf. on Software Maintenance and Evolution (ICSME'15)*, Bremen, Germany, pp. 556–560, September/October 2015 [acceptance rate: 35%].
- [13] L. Liu, J. Zhang, N.A. Kraft, "Using Domain Specific Language for Large Screen Game Interaction," *Proc. 6th IEEE Games, Entertainment, and Media Conference (GEM'14)*, Toronto, ON, Canada, pp. 1–6, October 2014.
- [14] B.P. Eddy[⊙] and N.A. Kraft, "Using Structured Queries for Source Code Search," *Proc. 30th IEEE Int'l Conf. on Software Maintenance and Evolution (ICSME'14)*, Victoria, BC, Canada, pp. 431–435, September 2014 [acceptance rate: 36%].
- [15] C.S. Corley[⊙], K.L. Kashuda[★], D.S. May[★], and N.A. Kraft, "Modeling Changeset Topics," *Proc. 4th IEEE Wksp. on Mining Unstructured Data (MUD'14)*, Victoria, BC, Canada, pp. 6–10, September 2014.
- [16] V. Singh[⊙], W.B. Snipes, and N.A. Kraft, "A Framework for Estimating Interest on Technical Debt by Monitoring Developer Activity Related to Code Comprehension," *Proc. 6th IEEE Int'l Wksp. on Managing Technical Debt (MTD'14)*, Victoria, BC, Canada, pp. 27–30, Sep 2014.
- [17] N. Klein[★], C.S. Corley[⊙], and N.A. Kraft, "New Features for Duplicate Bug Report Detection," *Proc. 11th Working Conf. on Mining Software Repositories (MSR'14)*, Hyderabad, India, pp. 324–327, May/June 2014 [acceptance rate: 37%].
- [18] E. Hassler[⊙], J.C. Carver, N.A. Kraft, and D.P. Hale, "Outcomes of a Community Workshop to Identify and Rank Barriers to the Systematic Literature Review Process," *Proc. 18th Int'l Conf. on Evaluation and Assessment in Software Engineering (EASE'14)*, London, UK, May 2014.
- [19] D. Chatterji[⊙], J.C. Carver, N.A. Kraft, and J. Harder, "Effects of Cloned Code on Software Maintainability: A Replicated Developer Study," *Proc. 20th Working Conf. on Reverse Engineering (WCRE'13)*, Koblenz, Germany, pp. 112–121, October 2013 [acceptance rate: 39%].
- [20] J.C. Carver, E. Hassler[⊙], E. Hernandez[⊙], and N.A. Kraft, "Identifying Barriers to the Systematic Literature Review Process," *Proc. 7th ACM/IEEE Int'l Sym. on Empirical Software Engineering and Measurement (ESEM'13)*, Baltimore, MD, USA, pp. 203–212, October 2013 [acceptance rate: 28%].
- [21] B.P. Eddy[⊙], J.A. Robinson[⊙], N.A. Kraft, and J.C. Carver, "Evaluating Source Code Summarization Techniques: Replication and Expansion," *Proc. 21st IEEE Int'l Conf. on Program Comprehension (ICPC'13)*, San Francisco, CA, USA, pp. 13–22, May 2013 [acceptance rate: 30%].
- [22] B. Bassett[⊙] and N.A. Kraft, "Structural Information Based Term Weighting in Text Retrieval for Feature Location," *Proc. 21st IEEE Int'l Conf. on Program Comprehension (ICPC'13)*, San Francisco, CA, USA, pp. 133–141, May 2013 [acceptance rate: 30%].

- [23] A. Bosu[°], C.S. Corley[°], D. Heaton[°], D. Chatterji[°], J.C. Carver, and N.A. Kraft, "Building Reputation in StackOverflow: An Empirical Investigation," *Proc. 10th Working Conf. on Mining Software Repositories (MSR'13) — Mining Challenge*, San Francisco, CA, USA, pp. 89–92, May 2013 [acceptance rate: 41%].
- [24] D. Chatterji[°], J.C. Carver, and N.A. Kraft, "Cloning: The Need to Understand Developer Intent," *Proc. 7th Int'l Wksp. on Software Clones (IWSC'13)*, San Francisco, CA, USA, pp. 14–15, May 2013.
- [25] M.D. Beard[°], N.A. Kraft, and L.H. Etzkorn, "Code Clones in Rhino: A Case Study," *Proc. 16th IASTED Int'l Conf. on Software Engineering and Applications (SEA'12)*, Las Vegas, NV, USA, 10 pages, November 2012.
- [26] C.S. Corley[°], E.A. Kammer[°], and N.A. Kraft, "Modeling the Ownership of Source Code Topics," *Proc. 20th IEEE Int'l Conf. on Program Comprehension (ICPC'12)*, Passau, Germany, pp. 173–182, June 2012 [acceptance rate: 41%].
- [27] D. Chatterji[°], J.C. Carver, and N.A. Kraft, "Claims and Beliefs about Code Clones: Do We Agree as a Community? A Survey," *Proc. 6th Int'l Wksp. on Software Clones (IWSC'12)*, Zurich, Switzerland, pp. 15–21, June 2012. **Winner, People's Choice Award for Best Technical Paper.**
- [28] R. Delamare and N.A. Kraft, "A Genetic Algorithm for Computing Class Integration Test Orders for Aspect-Oriented Systems," *Proc. 5th IEEE Int'l Conf. on Software Testing, Verification, and Validation (ICST'12)*, Montreal, Quebec, Canada, pp. 804–813, April 2012.
- [29] X. Hong, J.C. Lusth, N.A. Kraft, and D.M. McCallum, "Evolution of the 100 Problems Curriculum of Computer Science," *Proc. ASEE Southeastern Section Conf. (ASEE-SE'12)*, Starkville, MS, USA, 10 pages, April 2012.
- [30] M.D. Beard[°], N.A. Kraft, L.H. Etzkorn, and S.K. Lukins, "Measuring the Accuracy of Information Retrieval based Bug Localization Techniques," *Proc. 18th Working Conf. on Reverse Engineering (WCRE'11)*, Lero, Ireland, pp. 124–128, October 2011 [acceptance rate: 48%].
- [31] N.A. Kraft, X. Hong, J.C. Lusth, and D. McCallum, "Experiences with CS2 and Data Structures in the 100 Problems Format," *Proc. 41st ASEE/IEEE Frontiers in Education Conf. (FIE'11)*, Rapid City, SD, USA, pp. F4G-1–F4G-7, October 2011.
- [32] L.R. Biggers[°], B.P. Eddy[°], N.A. Kraft, and L.H. Etzkorn, "Toward a Metrics Suite for Source Code Lexicons," *Proc. 27th IEEE Int'l Conf. on Software Maintenance (ICSM'11)*, Williamsburg, VA, USA, pp. 492–495, September 2011 [acceptance rate: 38%].
- [33] D. Chatterji[°], J.C. Carver, B. Massengill^{*}, J. Oslin[°], and N.A. Kraft, "Measuring the Efficacy of Code Clone Information in a Bug Localization Task: An Empirical Study," *Proc. 5th ACM/IEEE Int'l Sym. on Empirical Software Engineering and Measurement (ESEM'11)*, Banff, Alberta, Canada, pp. 20–29, September 2011 [acceptance rate: 31%].
- [34] C.S. Corley^{*}, N.A. Kraft, L.H. Etzkorn, and S.K. Lukins, "Recovering Traceability Links between Source Code and Fixed Bugs via Patch Analysis," *Proc. 6th Int'l Wksp. On Traceability in Emerging Forms of Software Engineering (TEFSE'11)*, Honolulu, HI, USA, pp. 31–37, May 2011 [acceptance rate: 44%].

- [35] J.C. Carver, D. Chatterji[⊙], and N.A. Kraft, "On the Need for Human-based Empirical Validation of Techniques and Tools for Code Clone Analysis," *Proc. 5th Int'l Wksp. on Software Clones (IWSC'11)*, Honolulu, HI, USA, pp. 61–62, May 2011.
- [36] J.C. Carver and N.A. Kraft, "Evaluating the Testing Ability of Senior-level Computer Science Students," *Proc. 24th IEEE-CS Conf. on Software Engineering Education and Training (CSEE&T'11)*, Honolulu, HI, USA, pp. 169–178, May 2011 [acceptance rate 40%].
- [37] B.P. Eddy[⊙] and N.A. Kraft, "Toward an understanding of the relationship between the identifier and comment lexicons," *Proc. 49th ACM Southeast Conf. (ACM-SE'11)*, Kennesaw, GA, USA, pp. 342–343, March 2011. **Winner, Best Poster award.**
- [38] L.R. Biggers[⊙] and N.A. Kraft, "Quantifying the Similarities between Source Code Lexicons," *Proc. 49th ACM Southeast Conf. (ACM-SE'11)*, Kennesaw, GA, USA, pp. 80–85, March 2011 [acceptance rate: 54%].
- [39] D. Chatterji[⊙], B. Massengill[★], J. Oslin[⊙], J.C. Carver, and N.A. Kraft, "Measuring the Efficacy of Code Clone Information: An Empirical Study," *Proc. Evaluation and Usability of Programming Languages and Tools (PLATEAU'10)*, Reno, NV, USA, 6 pages, October 2010.
- [40] C. Patterson[★], N.A. Kraft, and S. Burkett, "AVS: Science and Technology Virtual Museum," *Proc. ASEE Annual Conf. & Expo (ASEE'10)*, Louisville, KY, USA, 4 pages, June 2010.
- [41] M. Brown, X. Hong, N.A. Kraft, and J.C. Lusth, "100P: A Guided Discovery Curriculum for Computer Science," *Proc. 41st ACM Technical Sym. on Computer Science Education (SIGCSE'10)*, Milwaukee, WI, USA, pp. 580, March 2010.
- [42] P. Shao[⊙], R.K. Smith, and N.A. Kraft, "Combining Latent Semantic Indexing and Call Graphs to Improve Feature Location," *Proc. IASTED Int'l Conf. on Software Engineering and Applications (SEA'09)*, Cambridge, MA, USA, 6 pages, November 2009.
- [43] J.C. Lusth, N.A. Kraft, and J. Tacey[★], "Language Subsetting via Reflection and Overloading," *Proc. 39th ASEE/IEEE Frontiers in Education Conf. (FIE'09)*, San Antonio, TX, USA, 6 pages, October 2009.
- [44] Y. Liang[⊙], N.A. Kraft, and R.K. Smith, "Automatic Class Matching to Compare Extracted Class Diagrams: Approach and Case Study," *Proc. 21st Int'l Conf. on Software Engineering and Knowledge Engineering (SEKE'09)*, Boston, MA, USA, 5 pp., July 2009 [acceptance rate: 38%].
- [45] S.K. Lukins[⊙], N.A. Kraft, and L.H. Etzkorn, "Source Code Retrieval for Bug Localization using Latent Dirichlet Allocation," *Proc. 15th Working Conf. on Reverse Engineering (WCRE'08)*, Antwerp, Belgium, pp. 155–164, October 2008 [acceptance rate: 29%].
- [46] N.A. Kraft and K.S. Webb[⊙], "Evaluating the Accuracy of Call Graphs Extracted with the Eclipse CDT," *Proc. 20th Int'l Conf. on Software Engineering and Knowledge Engineering (SEKE'08)*, San Francisco, CA, USA, pp. 85–90, July 2008 [acceptance rate: 48%].

- [47] N.A. Kraft, B.W. Bonds[◊], and R.K. Smith, “Cross-Language Clone Detection,” *Proc. 20th Int’l Conf. on Software Engineering and Knowledge Engineering (SEKE’08)*, San Francisco, CA, USA, pp. 54–59, July 2008 [acceptance rate: 48%].
- [48] B.N. Hoipkemier, N.A. Kraft, and B.A. Malloy, “3D Visualization of Class Template Diagrams for Deployed Open Source Applications,” *Proc. 18th Int’l Conf. on Software Engineering and Knowledge Engineering (SEKE’06)*, 4 pages, July 2006.
- [49] N.A. Kraft, B.A. Malloy, and J.F. Power, “Toward an Infrastructure to Support Interoperability in Reverse Engineering,” *Proc. 12th Working Conf. on Reverse Engineering (WCRE’05)*, Pittsburgh, PA, USA, pp. 196–205, November 2005 [acceptance rate: 36%].
- [50] A.C. Jamieson, N.A. Kraft, J.O. Hallstrom, and B.A. Malloy, “A Metric Evaluation of Game Application Software,” *Proc. Future Play: The Int’l Academic Conf. on the Future of Game Design and Technology*, East Lansing, MI, USA, 6 pages, October 2005.
- [51] N.A. Kraft, B.A. Malloy, and J.F. Power, “g4re: Harnessing GCC to Reverse Engineer C++ Applications,” *Dagstuhl Seminar Proc. 05161: Transformation Techniques in Software Engineering*, Dagstuhl, Germany, 11 pages, April 2005.
- [52] R.B. Finkbine and N.A. Kraft, “Introducing the Test Harness: Automating the Test Suite,” *Proc. Information Systems Education Conf. (ISECON’02)*, San Antonio, TX, USA, 3 pages, November 2002.

Invited/Editorially Reviewed Journal Articles

- [1] C.J. Hayes[★], B.D. Nichols[◊], N.A. Kraft, and M.D. Anderson, “Improving LSI-based Bug Localization using Historical Patch Data,” *The University of Alabama McNair Journal*, 10(1): 51–60, Spring 2010.
- [2] B.A. Malloy, N.A. Kraft, J.O. Hallstrom, and J.M. Voas, “Improving the Predictable Assembly of Service-Oriented Architectures,” *IEEE Software*, 23(2): 12–15, March 2006.

Refereed Conference and Workshop Proceedings (Advisees as Sole-Authors)

- [1] L.R. Biggers[◊], “The effects of identifier retention and stop word removal on a latent Dirichlet allocation based feature location technique,” *Proc. 50th ACM Southeast Conf. (ACM-SE’12)*, Tuscaloosa, AL, USA, pp. 164–169, April 2012.
- [2] B.D. Nichols[◊], “Augmented Bug Localization using Past Bug Information,” *Proc. 48th ACM Southeast Conf. (ACM-SE’10)*, Oxford, MS, USA, 6 pages, April 2010.

Other Conference and Workshop Presentations

- [1] Z. Yu[◊], N.A. Kraft, T. Menzies, “Finding Better Active Learners for Faster Literature Reviews,” *Journal-First Presentation at the ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE’18)*, Lake Buena Vista, FL, USA, November 2018.

- [2] B.P. Eddy, N.A. Kraft, and J. Gray, "Impact of Structural Weighting on a Latent Dirichlet Allocation Based Feature Location Technique," *Journal-First Presentation at the 34th IEEE Int'l Conference on Software Maintenance and Evolution (ICSME'18)*, Madrid, Spain, September 2018.
- [3] K. Damevski, H. Chen, D.C. Shepherd, N.A. Kraft, L. Pollock, "Predicting Future Developer Behavior in the IDE Using Topic Models," *Journal-First Presentation at the 40th Int'l Conference on Software Engineering (ICSE'18)*, Gothenburg, Sweden, June 2018.
- [4] M.J. Decker, C.D. Newman, N. Dragan, M. Collard, J.I. Maletic, N.A. Kraft, "Poster F1: A Taxonomy of How Method Stereotypes Change," *Proc. 40th International Conference on Software Engineering (ICSE'18)*, Gothenburg, Sweden, June 2018.
- [5] P.W. McBurney, S. Jiang, M. Kessentini, N.A. Kraft, A. Armaly, W. Mkaouer, and C. McMillan, "Towards Prioritizing Documentation Effort," *Journal-First Presentation at the Joint Meeting of the European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering (ESEC/FSE'17)*, Paderborn, Germany, September 2017.
- [6] K. Damevski, D. Shepherd, N.A. Kraft, and L. Pollock, "Supporting Developers in Porting Software via Combined Textual and Structural Analysis of Software Artifacts," *Poster Presentation at the Computational Science & Engineering Software Sustainability and Productivity (CSESSP) Challenges Workshop*, Washington, DC, USA, October 2015.
- [7] B.P. Eddy[©] and N.A. Kraft, "Toward an understanding of the relationship between the identifier and comment lexicons," *Poster Presentation at the 49th ACM Southeast Conf. (ACM-SE'11)*, Kennesaw, GA, USA, March 2011.
- [8] M. Brown, X. Hong, N.A. Kraft, and J.C. Lusth, "100P: A Guided Discovery Curriculum for Computer Science," *Poster Presentation at the 41st ACM Technical Sym. on Computer Science Education (SIGCSE'10)*, Milwaukee, WI, USA, March 2010.
- [9] N.A. Kraft, B.A. Malloy, and J.F. Power, "g4re: A Tool Chain for Reverse Engineering C++," *Tool Demonstration at the 12th Working Conf. on Reverse Engineering (WCRE'05)*, Pittsburgh, PA, USA, November 2005.

Invited Talks

Demonstrating Leadership in a Matrix Organization

North Carolina State University, Raleigh, NC, USA (August 2, 2018)

Supporting Comprehension of Rapidly Evolving Software

University of Notre Dame, Notre Dame, IN, USA (March 2, 2017)

Industrial Software Engineering Research at ABB

William & Mary, Williamsburg, VA, USA (December 7, 2017)

East Carolina University, Greenville, NC, USA (July 13, 2016)

Virginia Commonwealth University, Richmond, VA, USA (February 5, 2016)

Topic Modeling for Program Comprehension

Clemson University, Clemson, SC, USA (April 25, 2012)

Recovering Traceability Links between Source Code and Issue Reports

The University of Alabama in Huntsville, Huntsville, AL, USA (March 4, 2011)

Improved Code Clone Categorization

Alabama A&M University, Normal, AL, USA (November 24, 2010)

Google Tech Talk, Atlanta, GA, USA (June 24, 2010) — **Available on YouTube**

Recovery and Metrics-Guided Refactoring of a Grammar from a Hard-Coded Parser

Alabama IEEE Computer Society, Birmingham, AL, USA (November 24, 2008)

The University of Mississippi, University, MS, USA (November 19, 2008)

Innovations in Computer Science Education at The University of Alabama

Duke University, Durham, NC, USA (February 27, 2009)

NetApp, Research Triangle Park, NC, USA (February 26, 2009)

Teaching

New courses (★) and 100P² courses (∞) are noted.

Graduate Courses

- CS 600 Foundations of Software Engineering (Fall 2008)
- CS 603 Organization of Programming Languages (Spring 2011, Spring 2010, Spring 2009)
- ★ CS 631 Software Maintenance and Evolution (Spring 2012, Fall 2009)
- ★ CS 691 Analysis, Testing, and Maintenance of Object-Oriented Software (Fall 2007)

Undergraduate Courses (The University of Alabama)

- ★ CS 250 Programming II (Spring 2014, Fall 2013, Spring 2013, Fall 2012, Fall 2010, Fall 2009)
- ∞ CS 260 Foundations of Computer Science (Fall 2010, Spring 2010, Fall 2009)
- ∞ CS 315 Software Engineering (Spring 2013, Fall 2010)
- ∞ CS 357 Data Structures (Spring 2010)
- ∞ CS 360 Data Structures & Algorithm Analysis (Spring 2011, Fall 2010)
- ∞ CS 403 Programming Languages (Spring 2011, Fall 2010)
- CS 403/503 Programming Languages (Spring 2014, Fall 2008)
- CS 415/515 Software Design and Development (Fall 2012, Fall 2011, Spring 2008)
- ★ CS 420/520 Software Maintenance & Evolution (Fall 2013)
- CS 434 Compiler Construction (Summer 2008)

Undergraduate Courses (Clemson University)

- CPSC 111 Elementary Programming in C/C++ (Fall 2006)

² http://www.nsf.gov/awardsearch/showAward?AWD_ID=0837210

Student Supervision

Past Graduate Students — Advisor (12)

- Christopher S. Corley, PhD (May 2018)
First position after graduation: Software Engineer in Chattanooga, Tennessee
- Christopher Hodapp, MS (May 2014)
First position after graduation: Scala/Java Developer at Rocket Lawyer
- Blake Bassett, MS (May 2013)
First position after graduation: PhD Student at University of Illinois at Urbana-Champaign
- Elizabeth A. Kammer, MS (December 2012)
First position after graduation: Software Engineer at SAIC
- Lauren R. Biggers, PhD (August 2012)
First position after graduation: Software Engineer at McKesson Pharmaceutical
- Yan Liang, PhD (December 2011)
Co-advised with Randy K. Smith
First position after graduation: Software Engineer at Tagged
- Peng Shao, PhD (August 2011)
Co-advised with Randy K. Smith
First position after graduation: MBA Student at The University of Alabama
- Michael G. Raines, MS (December 2010)
First position after graduation: Software Engineer at Amazon
- Tom Childress, MS (May 2010)
First position after graduation: Software Engineer at Boeing
- Brent D. Nichols, MS (May 2010)
First position after graduation: Software Engineer at SAIC
- Adam Ferguson, MS (May 2008)
First position after graduation: Assistant Research Engineer at The University of Alabama
- Kevin Webb, MS (May 2008)
First position after graduation: MIS Analyst at Intergraph

Past Graduate Students — Committee Member (11)

- Paige Rodeghero, PhD (2018; University of Notre Dame; advisor: Collin McMillan)
First position after graduation: Assistant Professor at Clemson University
- Boyang Li, PhD (2017; College of William & Mary; advisor: Denys Poshyvanyk)
First position after graduation: Software Engineer at ABB Inc.
- Brian P. Eddy, PhD (2015; advisor: Jeff Gray)
First position after graduation: Assistant Professor at the University of West Florida
- Debarshi Chatterji, PhD (2014; advisor: Jeffrey C. Carver)
First position after graduation: Senior Developer at State of Alabama
- Matthew Beard, PhD (2013; University of Alabama in Huntsville; advisor: Letha H. Etzkorn)
- Feroosh Jacob, PhD (2013; advisor: Jeff Gray)
First position after graduation: Software Engineer at Home Depot
- Madhav Rao, PhD (2012; ECE; advisor: Susan Burkett)
First position after graduation: Faculty at IIIT-Bangalore

- Jason Oslin, MS (May 2010; advisor: Jeffrey C. Carver)
First position after graduation: Software Engineer at Harris
- Robert Tairas, PhD (May 2010; University of Alabama at Birmingham; advisor: Jeff Gray)
First position after graduation: Postdoc at INRIA/EMN
- Graylin Trevor Jay, PhD (Aug 2009; advisor: Randy K. Smith)
First position after graduation: Postdoc at Brown University
- Janet T. Jenkins, PhD (Aug 2008; advisor: Randy K. Smith)
First position after graduation: Faculty at University of North Alabama

Past Undergraduate Students (36)

- Madeline Leaman, REU Participant (2018; Furman University)
- Kimberly Sparks, REU Participant (2018; Northern Kentucky University)
- Brian Hanson, REU Participant (2017; University of Maryland, Baltimore County)
- Cindi Simmons, REU Participant (2017; Kennesaw State University)
- Blake Thrower, REU Participant (2017; Clemson University)
- Anthony Benavente, REU Participant (2016; Western Carolina University)
- Nadeen Saleh, REU Participant (2016; Florida Atlantic University)
- Kelly Kashuda, REU Participant (2014)
- Daniel May, REU Participant (2014; Swarthmore College)
- Melissa J. Jenkins, REU Participant (2013)
First position after graduation: Senior Associate Analytical Consultant at SAS
- Nathan Klein, REU Participant (2013; Oberlin College)
- Stephanie L. Kuhne, REU Participant (2013; Department of Mathematics)
First position after graduation: Edison Engineering Development Program at GE
- Ryan Rachford, REU Participant (2013; College of Charleston)
- Casey Ferris, REU Participant (2012)
First position after graduation: PhD Student at University of Notre Dame
- Colin Hemphill, REU Participant (2012; Belmont University)
- Christopher Hodapp (2012)
- Conor Kirkman, REU Participant (2012; Harding University)
- Paige Rodeghero, REU Participant (2012; Ball State University)
First position after graduation: PhD Student at University of Notre Dame
- Jeff Byrd (2012, 2009)
First position after graduation: Software Engineer at FedEx
- Cecylia Bocovich, REU Participant (2011; Macalester College)
First position after graduation: PhD Student at University of Waterloo
- Riley Capshaw, REU Participant (2011; Hendrix College)
- Adam Cardenas, REU Participant (2011; California State University, Fresno)
First position after graduation: PhD Student at University of Colorado Boulder
- John Cipriano, REU Participant (2011; Fairfield University)
- Anastasia Drebot, REU Participant (2011; James Madison University)
- Juliet Rubin, REU Participant (2011; University of San Francisco)

- Andrew Springall, REU Participant (2011)
First position after graduation: PhD Student at University of Michigan
- Elizabeth A. Williams, REU Participant (2011), Research Assistant (2010)
First position after graduation: PhD Student at The University of Alabama
- Nathan Bishop, Research Assistant (2010)
- Bethany Blackmon, REU Participant (2010; Tennessee State University)
- Rachael Breece, REU Participant (2010; Tennessee Tech University)
First position after graduation: MS Student at Tennessee Tech University
- Christopher S. Corley, REU Participant (2010, 2009; University of North Alabama)
First position after graduation: PhD Student at The University of Alabama
- Anton Dukeman (2009)
First position after graduation: MS Student at The University of Alabama
- Cory J. Hayes, McNair Scholar (2009)
First position after graduation: PhD Student at University of Notre Dame
- Elizabeth A. Kammer, REU Participant (2009; Department of Mathematics)
First position after graduation: MS Student at UA
- Ben Lemmond, REU Participant (2009)
First position after graduation: MS Student at The University of Alabama
- Keith H. Weber, Computer-Based Honors Student (2008)
First position after graduation: MS Student at UA

Professional Activities

Editorial Board Member

- IEEE Software: 2016–
- Journal of Systems and Software (Elsevier): 2017–

Steering Committee Member

- IEEE Int'l Conf. on Software Maintenance & Evolution (ICSME): 2016–2019

Organizing Committee Member

- Industry Track Co-Chair, 35th IEEE Int'l Conf. on Software Maintenance & Evolution (ICSME'19)
- Awards Committee Co-Chair, 33nd IEEE Int'l Conf. on Software Maintenance & Evolution (ICSME'17)
- Artifacts Track Co-Chair, 33nd IEEE Int'l Conf. on Software Maintenance & Evolution (ICSME'17)
- General Chair, 11th Int'l Wksp. on Software Clones (IWSC'17)
- General Co-Chair, 32nd IEEE Int'l Conf. on Software Maintenance & Evolution (ICSME'16)
- Tool Demo Track Co-Chair, 31st IEEE Int'l Conf. on Software Maintenance & Evolution (ICSME'15)
- Workshops Co-Chair, 20th Working Conf. on Reverse Engineering (WCRE'13)
- Student Paper Competition Judge and Web Chair, 50th ACM Southeast Conf. (ACM-SE'12)
- Publicity Co-Chair, 3rd Int'l Conf. on Software Language Engineering (SLE'10)

- Program Co-Chair, 48th ACM Southeast Conf. (ACM-SE'10)
- Publicity Chair, 17th Int'l Conf. on Program Comprehension (ICPC'09)

Program Committee Member

- ACM/IEEE Int'l Conf. on Automated Software Engineering (ASE): 2018
- ACM/IEEE Int'l Conf. on Mining Software Repositories (MSR): 2017, 2018
- ACM/IEEE Int'l Conf. on Software Engineering (ICSE) — J1C2: 2018
- ACM/IEEE Int'l Conf. on Software Engineering (ICSE) — SEIP Track: 2017
- ACM SIGSOFT Sym. on Foundations of Software Engineering (FSE) — Industry Track: 2017
- ACM SIGSOFT Sym. on Foundations of Software Engineering (FSE) — NIER Track: 2018
- IEEE Int'l Conf. on Program Comprehension (ICPC): 2009–2011, 2013–2015
- IEEE Int'l Conf. on Program Comprehension (ICPC) — Industry Track: 2017
- IEEE Int'l Conf. on Software Analysis, Evolution, and Reengineering (SANER): 2017, 2018
- IEEE Int'l Conf. on Software Maintenance & Evolution (ICSME): 2017, 2018
- IEEE Int'l Conf. on Software Maintenance & Evolution (ICSME) — J1C2: 2017, 2018
- IEEE Int'l Conf. on Software Maintenance & Evolution (ICSME) — ERA Track: 2010–2015
- IEEE Int'l Conf. on Software Maintenance & Evolution (ICSME) — Tool Demo Track: 2014
- IEEE Int'l Sym. on High Assurance Systems Engineering (HASE): 2014
- IEEE Int'l Sym. on Software Reliability Engineering (ISSRE) — Student Papers: 2011
- IEEE Wksp. on Mining Unstructured Data (MUD): 2014, 2015
- Working Conf. on Reverse Engineering (WCRE): 2011–2013
- Int'l Conf. on Software Language Engineering (SLE): 2009–2011
- Int'l Conf. on Software Engineering and Knowledge Engineering (SEKE): 2009–2014
- Int'l Conf. on Software Engineering Research, Management and Applications (SERA): 2009
- Int'l Wksp. on Software Clones (IWSC): 2012, 2013, 2015, 2016, 2018
- Int'l Wksp. on Traceability in Emerging Forms of Software Engineering (TEFSE): 2013
- Workshop on Automating Service Quality (WRASQ): 2007

Panelist

- National Science Foundation (NSF): 2009, 2011

Reviewer

- **Conferences**
 - ACM Technical Sym. on Computer Science Education (SIGCSE): 2009–2014
 - ACM Conf. on Innovation and Technology in Computer Science Education: 2010
 - ASEE/IEEE Frontiers in Education Conf. (FIE): 2009, 2011
- **Journals**
 - ACM Transactions on Software Engineering and Methodology (ACM)
 - Advances in Software Engineering (Hindawi)
 - Empirical Software Engineering (Springer)
 - IEEE Transactions on Reliability (IEEE Reliability Society)
 - IEEE Transactions on Software Engineering (IEEE Computer Society)
 - Int'l Journal of Computers and Applications (Acta Press)
 - Int'l Journal of Software Engineering and Knowledge Engineering (World Scientific)
 - Journal of Computer Science and Technology (Springer)

- Journal of Software Engineering (Science Alert)
 - Journal of Systems and Software (Elsevier)
 - Science of Computer Programming (Elsevier)
 - Software Engineering (Acta Press)
 - Software Practice & Experience (Wiley)
 - WIREs Data Mining and Knowledge Discovery (Wiley)
- **Funding Organizations**
 - National Science Foundation (NSF): 2012

External Reviewer

- Int'l Wksp. on Managing Technical Debt (MTD): 2016
- ACM Sym. on Applied Computing (SAC) — Software Engineering (SE): 2010
- IFIP Working Conf. on Domain Specific Languages (DSL WC): 2009
- Wksp. on Language Descriptions, Tools, and Applications (LDTA): 2006, 2007
- Int'l Conf. on Software Engineering Research, Management, and Applications (SERA): 2007

Member

- ACM SIGCSE Officer Nominating Committee: 2009

Institutional and Public Service

(ABB) U.S. Corporate Research Center Committees/Special Assignments/Service

- Organizer/Instructor, Professional Development Program for Summer Interns: 2015–2018

North Carolina State University Graduate School Committees/Special Assignments/Service

- Speaker (Lunch Leadership Series), Industry Immersion Program: 2018
- Reviewer (Elevator Talks and Resumes), Industry Immersion Program: 2017
- Mock Interviewer, Postdoc Mock Interviews: 2017

(UA) University Committees/Special Assignments/Service

- Information Technology Committee: 2013–2014

(UA) Graduate School Committees/Special Assignments/Service

- Faculty Mentor, Tide Together: 2011–2012, 2012–2013, 2013–2014
- Organizing Committee, Women in STEM Experience (WiSE) Event: 2012, 2013
- Session Panelist, New Faculty Orientation,
 - *Developing as a Teacher/Student Mentor and Researcher/Scholar*: 2013
- Group Facilitator, Tide Together Writing Bootcamp: 2012
- Panelist and Group Facilitator, Tide Together Writing Bootcamp: 2011
- Judge, Graduate Student Association Research and Thesis Conference: 2009
- Mentor, McNair Scholars Program: 2008–2009

(UA) College of Engineering Committees/Special Assignments/Service

- Instructor, Capstone 101 (Catapult Project), [Capstone Scholars Day](#): 2013
- Member, Doctoral Program Study Group: 2010–2011

- Member, Service Learning Program Development Committee: 2009
- Speaker, Alabama School of Math and Science Career Day: 2009

(UA) Department of Computer Science Committees/Special Assignments/Service

- Faculty Advisor, Upsilon Pi Epsilon: 2014
- Co-Founder, Concentration in Software Engineering: 2012
- Member, Faculty Search Committee: 2008–2009, 2009–2010, 2010–2011
- Member, Undergraduate Curriculum Task Force: 2009–2010
- Member, Graduate Program Task Force: 2008
- Faculty Advisor, Competitive Programming Team: 2008

Public Service

- Instructor, *Introduction to Programming*,
 - Roberts Park Community Center, Raleigh, NC: 2018 (40 students for 5 days), 2017 (40 students for 5 days), 2016 (40 students for 5 days), 2015 (20 students for 5 days), 2014 (10 students for 5 days)
- Instructor, *Introduction to Computing*,
 - Cottondale Elementary School, Cottondale, AL: 2011 (6 visits), 2010 (7 visits), 2009 (7 visits)
 - Flatwoods Elementary School, Northport, AL: 2011 (6 visits)
- Instructor, *Green Computing and Robotics*,
 - Francis Marion High School, Marion, AL: 2009 (3 visits)

Honors and Awards

Winner for Best Mining Challenge, 2018

Awarded to the authors of the best mining challenge at the 15th Int'l Conference on Mining Software Repositories (MSR'18).

Honorable Mention Award, 2017

Awarded by the ACM CHI Conference on Human Factors in Computing Systems to the authors of the top 5% of all submissions.

Second Prize for Visions of 2025 and Beyond, 2016

Awarded by the Computing Community Consortium (CCC) and selected by the program committee of Blue Sky Ideas Conference Track at the ACM/IEEE International Conference on Software Engineering (ICSE'16).

People's Choice Award for Best Technical Paper, 2012

Awarded to the authors of the best paper and selected by the attendees of the International Workshop on Software Clones (from eight papers that year).

Outstanding Graduate Student Researcher Award, 2005–2006

Sponsored by the Clemson University Research Foundation and awarded to two graduate students each year, selected from all of Clemson University (over 3,000 graduate students that year). The highest university honor that graduate students engaged in research can receive.

Outstanding Graduate Researcher Award, 2005–2006

Awarded to two graduate students each year, selected from the entire College of Engineering and Science at Clemson University (over 1,000 graduate students that year). The highest College of Engineering and Science honor for excellence in graduate research.

Outstanding PhD Student in Computer Science, 2005–2006

Awarded to one graduate student each year (from 34 PhD students that year). The highest departmental honor for PhD student excellence.

Special Faculty Recognition Award, 2005–2006

Awarded to two graduate students each year, selected from the entire Department of Computer Science at Clemson University (116 graduate students that year). The departmental award for exceptional students who have excelled in ways that cannot always be measured by traditional means.

Upsilon Pi Epsilon, 2004

International honor society for the computing and information disciplines.

Professional Memberships

Senior Member, Institute of Electrical and Electronics Engineers (IEEE)

IEEE Computer Society

IEEE Computer Society Technical Council on Software Engineering (TCSE)

Senior Member, Association for Computing Machinery (ACM)

Special Interest Group on Computer Science Education (SIGCSE)

Special Interest Group on Software Engineering (SIGSOFT)