Christian Newman

ASSISTANT PROFESSOR

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Education

PhD.	Computer Science	Kent State University	Summer 2017
M.S.	Computer Science	Kent State University	Fall 2013
B.S.	Computer Science	Kent State University	Fall 2010

Academic Experience

- **Assistant Professor**, Department of Software Engineering, Rochester, NY
  08/17 - Present
- **Graduate Research Assistantship,** Department of Computer Science, Kent State University, Kent, Ohio.
  01/16 – 08/17, Funded by the National Science Foundation, CNS 13-05292/05217.
- **Graduate Research Assistantship,** Department of Computer Science, Kent State University, Kent, Ohio.
  05/15 – 08/15, Funded by the National Science Foundation, CNS 13-05292/05217.
- **Teaching Assistantship**, Department of Computer Science, Kent State University, Kent, Ohio. (08/12-05/15).
- **Graduate Research Assistantship**, Department of Computer Science, Kent State University, Kent, Ohio.
  05/12 – 08/12, Funded by ABB inc.
- **Graduate Research Assistantship**, Department of Computer Science, Kent State University, Kent, Ohio.
  07/10 – 05/12, Funded by the National Science Foundation MRI-R2 CNS 09-59924.

Non-Academic Experience

- ABB Engineering and Research intern; wrote a wrapper around the srcML framework in C#. The project can be found here: https://github.com/abb-iss/SrcML.NET. Additionally, I wrote a web-based query builder for communicating between arbitrary database REST APIs and a UI. Employment dates: Aug 17th 2015 – Feb 17th 2016
- Kent State University IS as a Student Technician. Computer hardware and software end-user support, group policy management, software distribution. Employment dates: Aug. 2008 - Jun 2010

Advisor

Dr. Jonathan I. Maletic (2010 – 2017)

Research Interests & Statement

Software engineering, maintenance and evolution; specifically, program transformation, static analysis, program slicing, and program comprehension

Program Transformation

My interest in program transformation seeks to ease the burden of applying transformation and refactorings techniques automatically. Recently, there is an increased interest and reliance on systems that can support their own

evolution. It is important to ensure these techniques are safe, customizable, and easily integrated with today's software development processes.

Program Comprehension and Textual Analysis

I am interested in what direct analysis of source code can tell us about the mental model created by developers during development tasks. Specifically, I want to study how natural language used in source code is related to the behavior of source code itself. My work in this area attempts to model this this relationship with a goal of supporting stronger, developer-centric tools and techniques to improve comprehension and development.

Static Source Code Analysis

Static analysis techniques are the basis of a lot of my research, and most frequently I make use of the srcML Framework to normalize, transform, and analyze source code. On the whole, one of my favorite things to do is explore code; searching for patterns that can be used to improve and support software development using automated tools, visualization, and high-quality, code-centric models.

Funding

Proposals Submitted & Pending

Title	Investigator(s)	Agency/Source	Amount	Period
SHF:MEDIUM:Collaborative Research: Supporting Automated Evolution of Large-Scale Software ***Submitted September 2017 - declined***	Newman, C.D (RIT) Decker, M.J(BGSU) Maletic, J.I. (KSU)	National Science Foundation CCF: Core Programs	1.1M	4 years
SHF:SMALL:RUI:Collaborative Research: Enhancing Name Appraisal and Synthesis Using a Source Code-Natural Language Model ***Submitted November 2017 -declined***	Newman, C.D. (RIT) Hill, Emily (Drew)	National Science Foundation CCF: Core Programs	500k	3 years
CRII:SHF:Towards the Construction of a Model for Natural Language and Source Code ***Submitted August 2018 - Funded***	Newman, C.D. (RIT)	National Science Foundation CCF: Core Programs	174k	2 years
Sloan Foundation Grant ***Submitted August 2018 - Declined***	Newman, C.D (RIT)	Sloan Foundation	75k	2 years
SHF:SMALL:RUI:Collaborative Research: On-Demand Program Comprehension Using a Source Code-Natural Language Model ***Submitted November 2018 - declined***	Newman, C.D. (RIT) Hill, Emily (Drew)	National Science Foundation CCF: Core Programs	499k	3 years
SHF:SMALL:Designing a Domain Specifi Language to Support Software Refactoring ***Submitted November 2018 - declined***	Newman, C.D. (RIT) Mohamed Wiem Mkaouer (RIT)	National Science Foundation CCF: Core Programs	453k	3 years

Awards and Other Support

- **ABB Stipend** – Travel support to ICSME 2015 (~1600$)
- **Best Presentation Award** - 30th Annual Graduate Research Symposium 2015
- **NSF Travel Grant** - Travel support to ICSM ’11 (750$)
- **NSF REU** - Research Experience for Undergraduates (5000$)
- **NSF S-Stem Scholarship** – Undergrad scholarship for science, technology, engineering and mathematics (5000$) – 2009-2010

Publications and Scholarly Work (Also see: Google Scholar)

Research Publications

1. Christian Newman, Michael J. Decker, Reem Alsuhaibani, Dishant Kaushik, Anthony Peruma and Emily Hill. "**An Empirical Study of Abbreviations and Expansions in Software Artifacts",** in the Proceedings of the 35th IEEE International Conference on Software Maintenance and Evolution (ICSME 2019). Cleveland, OH, USA, Sept 30th -Oct 4th, 2019, 12 pages, IEEE.
2. Zyrianov, V., Newman, C, D., Guarnera, D., Collard, M.L., Maletic, J.I. "**srcPtr: A Framework for Implementing Static Pointer Analysis Approaches**", in the Proceedings of *The 27th IEEE/ACM International Conference on Program Comprehension (ICPC 2019)*. Montreal, QC, Canada, May 25th – 26th, 2019, 5 pages, IEEE.
3. Newman, C,D., Dragan, N., Collard, M.L., Maletic, J.I, Decker, M.J., Guarnera, D., Abid, N. "**Automatically Generating Natural Language Documentation for Methods**", in the *Third International Workshop on Dynamic Software Documentation (DySDoc3)*. Madrid, Spain, September 25th, 2018, 2 pages, IEEE.
4. Guarnera, D., Collard, M.L., Dragan, N., Maletic, J.I, Newman, C. D., Decker, M.J. "**Automatically Redocumenting Source Code with Method and Class Stereotypes**", in the *Third International Workshop on Dynamic Software Documentation (DySDoc3)*. Madrid, Spain, September 25th, 2018, 2 pages, IEEE.
5. Decker, M.J., Newman, C,D., Collard, M.L., Guarnera, D., Maletic, J.I, (2018), "**A Timeline Summariation of Code Changes**", in the *Third International Workshop on Dynamic Software Documentation (DySDoc3)*. Madrid, Spain, September 25th, 2018, 2 pages, IEEE.
6. Peruma, A., Mkaouer, M. W., Decker, M. J., and Newman, C. D., (2018), "**An Empirical Investigation of How and Why Developers Rename Identifiers**", in *International Workshop on Refactoring*. Montpellier, France, September 4th, 2018, 8 pages, IEEE.
7. Newman, C.D., Mkaouer, M. W., Collard, M.L., Maletic, J.I., "**A Study on Developer Perception of Transformation Languages for Refactoring**", in *International Workshop on Refactoring*. Montpellier, France, September 4th, 2018, 8 pages, IEEE.
8. Decker, M., Newman, C., Dragan, N., Collard, M.L., Kraft, N.A., Maletic, J.I., "**Which Method-Stereotype Changes are Indicators of Code Smells**", in the Proceedings of the 18th IEEE International Working Conference on Source Code Analysis and Manipulation, Madrid, Spain, Sept 23-24, 2018, 11 pages.
9. Delozier, G., Decker, M.J., Newman, C.D., Maletic, J.I, "**Leveraging the Agile Development Process for Selecting Invoking/Excluding tests to Support Feature Location**", in the *Proceedings of The 26th IEEE International Conference on Program Comprehension (ICPC '18) Industry Track*, Gothenburg, Sweden, May 27th-28th, 2018, 10 pages.
10. Decker, M.J., Newman C.D., Dragan N., Collard, M.L., Maletic, J.I., N.A., Kraft, **"Poster: A taxonomy of how Method Stereotypes Change**", *Poster Proceedings of the 40th International Conference on Software Engineering (ICSE '18)*, Gothenburg, Sweden, May 27th – June 3rd, 2018, 2 pages.
11. Bartman, B., Newman, C. D., Collard, M.L., Maletic, J.I. " **srcQL: A Syntax-Aware Query Language for Source Code**", in the *Proceedings of 24th IEEE International Conference on Software Analysis, Evolution, and Reengineering* (SANER '17) Tool Demonstrations Track, Klagenfurt, Austria, Feb. 20-24, 2017, 5 pages.
12. Newman, C.D., Bartman, B., Collard, M.L., Maletic, J.I., "**Simplifying the Construction of Source Code Transformations via Automatic Syntactic Restructurings**", *Journal of Software Evolution and Process*, Vol. 29, No.4, April 2017, 28 pages, DOI 10.1002/smr.1831.
13. Newman, C. D., Newman, Alsuhaibani, R., Collard, M.L., Maletic, J.I., **"Lexical Categories for Source Code Identifiers**", *in the Proceedings of the 24th IEEE International Conference on Software Analysis, Evolution, and Reengineering* (SANER'17), Klagenfurt, Austria, Feb. 20-24, 2017, 12 pages
14. Newman, C.D., Michael L. Collard, and Jonathan I. Maletic. 2016. "**srcType: A Tool for Efficient Static Type Resolution**", in *Proceedings of the 32nd International Conference on Software Maintenance and Evolution* (ICSME '16). IEEE, Raleigh, NC, USA. 2 pages.
15. Newman, C.D., Tessandra Sage, Michael L. Collard, Hakam W. Alomari, and Jonathan I. Maletic. 2016. "**srcSlice: a tool for efficient static forward slicing**", in *Proceedings of the 38th International Conference on Software Engineering Companion* (ICSE '16). ACM, New York, NY, USA, 621-624.
16. R. S. Alsuhaibani, C. D. Newman, M. L. Collard and J. I. Maletic, "**Heuristic-based part-of-speech tagging of source code identifiers and comments",** *Mining Unstructured Data (MUD), 2015 IEEE 5th Workshop on*, Bremen, 2015, pp. 1-6.

17. Alali, A., Bartman, B., Newman, C.D., Maletic, J.I., "**A Preliminary Investigation of Using Age and Distance Measures in the Detection of Evolutionary Couplings**" in the Proceedings of the ACM International Working Conference on Mining Software Repositories (MSR'13), San Francisco, California, May 18-19, 2013, pp. 169-172.
18. Maletic, J.I., Mosora, D.J., Newman, C.D., Collard, M.L., Sutton, A., Robinson, B.P., (2011), "**MosaiCode: Visualizing Large Scale Software: A Tool Demonstration**", in the Proceedings of the IEEE International Workshop on Visualizing Software for Understanding and Analysis (VISSOFT'11), Williamsburg, VA, USA, Sept 31 – Oct 1, pp.

Online Publications

1. C.D Newman., M.J.Decker. Feb. 12th, 2013. srcML (Wikipedia Page) [Online]. http://en.wikipedia.org/wiki/SrcML

Software Systems Developed

- srcSlice – A program slicer https://github.com/srcML/srcSlice
- srctype – A tool for static type resolution https://github.com/srcML/srcType
- srcTL – A domain-specific language for program transformation (currently under development)
- Static analysis tool which tags identifiers with lexical category as described in *Lexical Categories for Source Code Identifiers* (not yet open-sourced)
- Event-Driven dispatcher framework to assist in the construction of srcML tools -- https://github.com/srcML/srcSAXEventDispatch

Teaching & Mentoring

Course Title/Duties	Terms/Dates	Institution
Foundations of Software Engineering	Fall 2019	Rochester Institute of Technology
Personal Software Engineering	Spring 2019	Rochester Institute of Technology
Foundations of Software Engineering	Fall 2018	Rochester Institute of Technology
Personal Software Engineering	Spring 2018	Rochester Institute of Technology
Software Quality Engineering	Fall 2017	Rochester Institute of Technology
Computer Science 2 (data structures) Laboratory instructor	Fall 2012 – Spring 2015	Kent State University
Intro to Databases Grader	Spring 2014	Kent State University

Graduate Students

- Dishant Kaushik – Aug 2017 – Present
- Anthony Peruma – April 2018 – Present
- Satyajit Mohapatra – August 2018 – December 2018 (graduated, Microsoft)
- Shimon Johnson – August 2018 – Present
- Tejal Vishoi – January 2019 – May 2019

Undergraduate Mentoring

- Tessandra Sage, Kent State University, Fall 2014.
- David Carlyn, Kent State University, Fall 2016
- Patricia Jordan, Kent State University, Spring 2017
- Vlas Zyrianov, Kent State University, Fall 2016 and Spring 2017

Masters Thesis Committee Member

- Rebaz Saleh, Rochester Institute of Technology, Graduated 12/2017
- Anthony Peruma, Rochester Institute of Technology, Graduated 5/2018
- Mazen Alotaibi, Rochester Institute of Technology, Graduated 5/2018
- Eman Abdullah Alomar, Rochester Institute of Technology, Graduated 5/2018
- Adriana Sejfia, Rochester Institute of Technology, Graduated 5/2018
- Kevin Hannigan, Rochester Institute of Technology, Graduated 8/2018
- Khalid Almalki, Rochester Institute of Technology, Graduated 12/2018
- Ahmed Aljohani, Rochester Institute of Technology, Graduated 5/2019
- Andrew Di Stassi, Rochester Institute of Technology, Graduated 5/2019

Professional Service (external)

Workshop Co-Chair

- Exploring the Shifting Sands: Accounting for Evolution in Analyzing Data from Social Media Platforms 2018, co-located with AOIR 2018.

Program Committee

- IEEE 34th International Conference on Software Maintenance and Evolution (ICSME'19) – Industry Track
- IEEE 34th International Conference on Software Maintenance and Evolution (ICSME'19) – Technical Track
- IEEE 27th International Conference on Program Comprehension (ICPC '19) – Technical Track
- IEEE 25th International Conference on Software Analysis, Evolution, and Reengineering (SANER'18) – ERA Track

Organizing Committee

- IEEE 34th International Conference on Software Maintenance and Evolution (ICSME'19) – Student Volunteer Chair

Journal Reviewer

- Journal of Systems and Software – Spring 2019

Workshop Attendance

- SEI Software Engineering Educators Workshop 2017

Professional Activities

Conferences Attended

- International Conference on Software Maintenance (ICSM '11)
- Working Conference on Software Visualization (VISSOFT '11)
- International Conference on Software Maintenance and Evolution (ICSME '15)
- Mining Unstructured Documents (MUD '15)
- International Conference on Software Maintenance and Evolution (ICSME '16)
- International Conference on Software Analysis, Evolution, and Reengineering (SANER '17)
- SEI Software Engineering Workshop for Educators 2017
- International Conference on Software Maintenance and Evolution (ICSME '18)
- International Conference on Software Engineering (ICSE'18)
- International Workshop on Refactoring (IWOR'18)
- Association of Internet Researchers (AOIR'19)

- International Conference on Software Engineering (ICSE‘19)
- International Conference on Program Comprehension (ICPC‘19)
- International Conference on Software Maintenance and Evolution (ICSME ’19)

Additional Reviewer

- IEEE 22nd International Conference on Software Analysis, Evolution, and Reengineering (SANER’16)
- IEEE 31st International Conference on Software Maintenance & Evolution (ICSME’15) – *ERA Track*
- ACM/IEEE 37th International Conference on Software Engineering (ICSE’15)
- IEEE 23rd International Conference on Program Comprehension (ICPC’15)
- ACM 8th International Symposium on Software and Systems Traceability (SST’15)
- IEEE International Working Conference on Software Visualization (VISSOFT’15)
- ACM/IEEE 36th International Conference on Software Engineering (ICSE’14)
- IEEE International Working Conference on Software Visualization (VISSOFT’14)
- IEEE 30th International Conference on Software Maintenance & Evolution (ICSME’14) – *ERA Track*
- IEEE CSMR-WCRE 2014, the European Conference on Software Maintenance (CSMR’14)
- IEEE 21st International Working Conference on Reverse Engineering (WCRE’14)
- IEEE 29th International Conference on Software Maintenance (ICSM’13)
- IEEE 21st International Conference on Program Comprehension (ICPC’13)
- ACM International Workshop on Traceability in Emerging Forms of Software Engineering (TEFSE’13)
- IEEE International Working Conference on Software Visualization (VISSOFT’13)
- IEEE 20th Working Conference on Reverse Engineering (WCRE’13)
- IEEE Transactions on Software Engineering (TSE)
- Journal of Software: Evolution and Process (Formerly Journal of Software: Maintenance and Evolution) (JSEP)

Programming Languages

Primary languages include C++, C, C#, and Python. I have some previous experience with Javascript, Haskell, and Java.