Joshua A. C. Behler

Graduate Research/Teaching Assistant

Department of Computer Science
Kent State University
Kent, Ohio, USA 44242

jbehler1@kent.edu
https://joshua2000b.github.io/
ORCID: 0009-0006-3104-7743

Education

Ph.D.	Computer Science	Kent State University	August 2026 (expected)
M.S.	Computer Science	Kent State University	Fall 2023
B.S.	Computer Science with Honors	Kent State University	Fall 2021

Academic Experience

- *Graduate Teaching Assistantship.* Department of Computer Science, Kent State University, Kent, Ohio. 08/2024 – present.
- *Graduate Research Assistantship*. Department of Computer Science, Kent State University, Kent, Ohio. 01/2022 – 08/2024.
- *Computer Science Tutor.* Department of Computer Science, Kent State University, Kent, Ohio. 08/2019 – 12/2021.

Advisor

Prof. Jonathan I. Maletic (2021 – present)

Research Statement

Interests: Program comprehension, eye-tracking, human-computer interaction, software engineering, evolution, and maintenance.

I have primarily contributed to the srcML and iTrace research projects, where I have developed tools to allow for easier analysis and visualization of eye-tracking data and written XML formats of various programming languages' grammars for parsing and eventual addition to the srcML Toolkit.

Projects

srcML

- *srcML Markup Specifications:* Currently oversees the creation of srcML Markup Specifications, an XML format that contains a laissez-faire markup of a programming language's grammar using srcML tags. The markup specifications will eventually be the input of a parser generator that will allow for the quick and easy addition of new languages to the srcML Toolkit. Languages worked with include but are not limited to Python, JavaScript, Swift, OpenQASM, Kotlin, and CMake.
- *pylibsrcml:* Continued pre-existing work on the Python Module pylibsrcml, a Python binding of the C Library libsrcml. Project emphasizes "Pythonic" mapping, including but not limited to the organization of new classes and support for Python's generator syntax.
- *srcQL:* Created a new implementation of the srcQL language by implementing it into the srcML command-line tool. Input srcQL queries are converted to corresponding XPaths which make use of minimal extension functions to implement the querying language.
- *nameCollector:* Added support for Python in nameCollector, a tool which automatically gathers the user-defined names from source code. Python name collection is a complex problem, due to Python not supporting traditional variable declarations.

iTrace

- *iTrace-Toolkit:* Co-developed and currently maintains the iTrace-Toolkit, a post-processing application within the iTrace Infrastructure that allows researchers to easily and quickly analyze data gathered during an eye-tracking study focused on source code. iTrace-Toolkit implements three existing fixation filters and uses srcML Archive files to accurately map gazes to tokens and syntactic information from the viewed source code.
- *iTrace-Core and iTrace IDE Plugins:* Helps maintain the iTrace-Core application, alongside upgrading and creating new iTrace IDE Plugins for use with iTrace-Core. Has worked on plugins for Visual Studio, Visual Studio Code, the JetBrains family of IDEs, Sublime, and Notepad++, as well as a plugin for the Open Broadcasting Software to support screen recording.
- *iTrace-Visualize:* Develops and oversees the creation of iTrace-Visualize, a post-processing tool that conglomerates data from the entire iTrace Infrastructure to create a video marked with visual indications of eye movement and syntactic information for the easy understanding and sharing of gathered data. The tool also supports the creation of heatmaps and graphs to visualize how tokens and regions of interest from the source code are viewed.

Funding Awards

- ***Kent State University Graduate Student Senate International Travel Award Spring 2025*** – Awarded **$1,500** for the purposes of traveling to Tokyo, Japan to attend ETRA 2025 and conduct a tutorial on the iTrace Infrastructure.
- ***Kent State University Graduate Student Senate Domestic Travel Award Fall 2024*** – Awarded **$300** for the purposes of traveling to Flagstaff, Arizona, United States to attend VISSOFT 2024 and present "Extending iTrace-Visualize to Support Token-based Heatmaps and Region of Interest Scarf Plots for Source Code" [5].
- ***National Science Foundation Student Travel Award*** – Awarded **$890** for the purposes of traveling to Flagstaff, Arizona, United States to attend ICSME 2024.
- ***Kent State University Graduate Student Senate International Travel Award Spring 2023*** – Awarded **$2,000** for the purposes of traveling to Melbourne, Australia to attend ICSE 2023 and present "iTrace-Toolkit: A Pipeline for Analyzing Eye-Tracking Data of Software Engineering Studies" [2].
- ***NSF Research Experience for Undergrads (REU)***. (iTrace) Summer 2020. Funded through NSF grant CNS 17-30181/30307

Awards, Honors, and Recognitions

- ***Best Tool Demo Award*** – Awarded for the lightning talk and tool demonstration for the paper [5] published at the IEEE Workshop on Visualizing Software for Understanding and Analysis (VISSOFT) 2024.
- ***LaunchNet + Enventys Mentoryship Award for Most Market/Venture Potential*** – Awarded at the KSU Fashion Tech Hackathon 2020, for the BackTrac project.
- ***Kent State Dean's List*** for Academic Excellence. Fall 2018 – Fall 2021

Publications and Scholarly Work

Citation counts are taken from Google Scholar (see Behler) and last retrieved on 17th November, 2025

Bibliometrics

- *h-index*: **4**
- *i10-index*: **1**
- Total: **43**

Works Under Review or Near Submission

- Rohrs, E., Behler, J.A.C., Park, K., Kozak, Z., Decker, M.J., Maletic, J.I., Sharif, B., "iTrace-Chrome: Enabling Eye Tracking in the Browser for Software Engineering Research", submitted to ICPC 2026 Tool Demonstrations Track.
- Behler, J.A.C., Al-Ramadan, F., Rossi, K., DeLozier, G.S., Decker, M.J., Collard, M.L., Maletic, J.I., "Constructing High-Quality Python Bindings for C Libraries", to be submitted Fall 2025 to the *Science of Computer Programming Journal.*
- Behler, J.A.C., Testa, S., Decker, M.J., Collard, M.L., Maletic, J.I., "nameCollector: A Tool to Collect All User-Defined Identifiers Within Source Code", to be submitted Spring 2026 to ICSME 2026 Demonstrations Track.

- Al-Ramadan, F., Behler, J.A.C., Sipahioglu, J.A., Dragan, N., Decker, M.J., Collard, M.L., Maletic, J.I., "Should this Method be Static? Automatic Identification of Static Method Candidates", to be submitted Fall 2025 to TSE.

Works Accepted and to Appear

- N/A

Publications (refereed)

11 Behler, J.A.C., Al-Ramadan, A.F., Baheri, B., Collard, M.L., Guan, Q., Maletic, J.I., "Analysis and Transformation for Quantum Programming Languages", in *IEEE Software*, vol. 42, no. 05, pp. 58-65, September-October, 2025, 7 pages.

10. Behler, J.A.C., "Evaluating the Effects on Comprehension in Python Code from Idiomatic Development", in the Proceedings of the 16th ACM Symposium on Eye Tracking Research and Applications (ETRA) Doctoral Consortium Track, Tokyo, Japan, May 26-29th, 2025, 4 pages.

9. Guarnera, D.T., Behler, J.A.C., Sharif, B., Maletic, J.I., "Automated Fixation Error Correction to Support Eye Tracking Studies on Source Code", in the Proceedings of the ACM on Human - Computer Interaction (PACM HCI), special issue on the 16th ACM Symposium on Eye tracking Research & Applications (ETRA), Tokyo, Japan, May 26-29th, 2025, 17 pages. (*Cited by **2***)

8. Behler, J.A.C., Kozak, Z., Park, K., Sharif, B., Maletic, J.I., "Extending Support for Analyzing Eye Tracking Studies on Python Source Code in iTrace", in the Proceedings of the 13th ACM International Workshop on Eye Movements in Programming (EMIP), Tokyo, Japan, May 26th, 2025, 6 pages.

7. Newman, C.D., Scholten, B., Testa, S., Behler, J.A.C., Banabilah, S., Collard, M.L., Decker, M.J., Mkaouer, M.W., Zampieri, M., AlOmar, E.A., Alsuhaibani, R., Peruma, A., Maletic, J.I., "SCALAR: A Part-of-speech Tagger for Identifiers", in the Proceedings of the 33rd IEEE/ACM International Conference on Program Comprehension (ICPC) Tool Demonstrations Track, Ottawa, Ontario, Canada, April 27-28th, 2025, 5 pages. (Received ***Honorable Mention***) (*Cited by **1***)

6. Al-Ramadan, A.F., Behler, J.A.C., Decker, M.J., Dragan, N., Collard, M.L., Maletic, J.I., "Stereocode: A Tool for Automatic Identification of Method and Class Stereotypes for Software Systems", in the Proceedings of the 40th IEEE International Conference of Software Maintenance and Evolution (ICSME) Tool Demo Track, Flagstaff, Arizona, United States, October 6-11th, 2024, 5 pages.

5. Behler, J.A.C., Villalobos, G., Pangonis, J., Sharif, B., Maletic, J.I., "Extending iTrace-Visualize to Support Token-based Heatmaps and Region of Interest Scarf Plots for Source Code", in the Proceedings of the 12th IEEE Working Conference on Software Visualization (VISSOFT) Tools Track, Flagstaff, Arizona, United States, October 6-7, 2024, 5 pages. (Received ***Best Tool Demo Award***) (*Cited by **4***)

4. Behler, J.A.C., Al-Ramadan, A.F., Baheri, B., Guan, Q., Maletic, J.I., "Supporting Static Program Analysis and Transformation of Quantum-Based Languages", in the Proceedings of the IEEE International Conference on Quantum Computing and Engineering (QCE) New Ideas and Emergent Results Track, Montréal, Québec, Canada, September 15-20, 2024, 7 pages. (*Cited by **1***)

3. Behler, J., Chiudioni, G., Ely, A., Pangonis, J., Sharif, B., Maletic, J.I., "iTrace-Visualize: Visualizing Eye-Tracking Data for Software Engineering Studies", in the Proceedings of the 11th IEEE Working Conference on Software Visualization (VISSOFT) NIER/TD Track, Bogota, Colombia, October 2-3, 2023, 6 pages. (*Cited by **9***)

2. Behler, J., Weston, P., Guarnera, D.T., Sharif, B., Maletic, J.I., "iTrace-Toolkit: A Pipeline for Analyzing Eye-Tracking Data of Software Engineering Studies", in the Proceedings of the 45th IEEE/ACM International Conference on Software Engineering (ICSE) Demonstrations Track, Melbourne, Australia, May 14-20, 2023, 4 pages. (*Cited by **17***)

1. Vlas Zyrianov, Cole S. Peterson, Drew T. Guarnera, Joshua Behler, Praxis Weston, Bonita Sharif, Jonathan I. Maletic, "Deja Vu: Semantics-Aware Recording and Replay of High-Speed Eye Tracking and Interaction Data to Support Cognitive Studies of Software Engineering Tasks - Methodology and Analyses", Journal of Empirical Software Engineering, Special Issue on Best Papers from ICSME 2020, 46 pages, accepted July 13, 2022. DOI 10.1007/s10664-022-10209-3. (*Cited by **9***)

Theses

- Behler, J., *Assessing Python Bindings of C Libraries with Respect to Python Idiomatic Conformance*, M.S. Thesis, Kent State University, Department of Computer Science, December 2023.

Presentations at Conferences, Symposia, and Workshops

- "Extending Support for Analyzing Eye Tracking Studies on Python Source Code in iTrace", at the 13th ACM International Workshop on Eye Movements in Programming (EMIP), Tokyo, Japan, May 26th, 2025.
- "Evaluating the Effects on Comprehension in Python Code from Idiomatic Development", at the 16th ACM Symposium on Eye Tracking Research and Applications (ETRA) Doctoral Consortium Track, Tokyo, Japan, May 26-29th, 2025.
- "Extending iTrace-Visualize to Support Token-based Heatmaps and Region of Interest Scarf Plots for Source Code", at the 12th IEEE Working Conference on Software Visualization (VISSOFT), Flagstaff, Arizona, United States, October 6th-7th, 2024
- "iTrace-Toolkit: A Pipeline for Analyzing Eye-Tracking Data of Software Engineering Studies" at the 2024 Kent State Graduate Student Symposium, Kent, Ohio, United States, April 1st-2nd, 2024.
- "iTrace-Toolkit: A Pipeline for Analyzing Eye-Tracking Data of Software Engineering Studies" at the 45th IEEE/ACM International Conference on Software Engineering (ICSE), Melbourne, Australia, May 14th-20th, 2023.

Scholarly Acknowledgements

- Guarnera, D.T., *SrcGaze: Automated Fixation Error Correction to Support Eye Tracking Studies on Source Code*, Ph.D. Dissertation, Kent State University, Department of Computer Science, December 2024.
- Al-Ramadan, A.F., *An Empirical Investigation of Method and Class Stereotype Distributions Across Software Systems in C++, C#, and Java*, M.S. Thesis, Kent State University, Department of Computer Science. May 2024.
- Park, K., Weill-Tesseri, P., Brown, N.C.C., Sharif, B., Jensen, N., Kölling, M., "An eye tracking study assessing the impact of background styling in code editors on novice programmers' code understanding", in the Proceedings of the 2023 ACM Conference on International Computing Education Research – Volume 1 (ICER), Chicago, Illinois, United States, August 8-10, 2023, 20 pages.

Professional Activities/Services

Organization

• **Web co-chair**	42nd IEEE International Conference on Software Maintenance and Evolution (ICSME 2026), Benevento, Italy, September 14-18	2026
• **Co-Organizer**	*Tutorial*: "Using the iTrace Pipeline to Conduct and Analyze Eye Tracking Studies in Software Engineering (iTrace Tutorial)" at the 19th ACM Symposium on Eye Tracking Research and Applications (ETRA), May 29th (180 minutes).	2025
• **Co-Organizer**	*Technical Briefing*: "srcML: Exploring, Analyzing, and Manipulating Source Code", at the 40th International Conference on Software Maintenance and Evolution (ICSME), October 9th (90 minutes).	2024
• **Student Facilitator**	*Technical Briefing*: "Conducting Eye Tracking Studies in Software Engineering - Methodology and Pipeline", at the 45th IEEE/ACM International Conference on Software Engineering (ICSE), May 18th (90 minutes).	2023

Journal Reviewer

- IEEE Transactions on Software Engineering, 1 paper, 2024

Conference Reviewer

- 2026 ACM Symposium of Eye Tracking Research & Applications– Reviewer
- 2026 IEEE/ACM International Conference on Program Comprehension – Additional Reviewer
- 2025 IEEE/ACM International Conference on Program Comprehension – Additional Reviewer
- 2025 IEEE International Conference on Software Maintenance and Evolution – Additional Reviewer
- 2025 ACM International Conference on the Foundations of Software Engineering – Additional Reviewer
- 2024 IEEE International Conference on Software Maintenance and Evolution – Additional Reviewer
- 2024 ACM Symposium of Eye Tracking Research & Applications– Additional Reviewer
- 2024 ACM International Conference on the Foundations of Software Engineering – Additional Reviewer
- 2024 IEEE/ACM International Conference on Program Comprehension – Additional Reviewer
- 2023 IEEE International Conference on Software Maintenance and Evolution – Additional Reviewer

- 2023 IEEE/ACM International Conference on Program Comprehension – Additional Reviewer
- 2023 IEEE/ACM International Conference on Software Engineering – Additional Reviewer

University Activities/Services

- *2025 Choose Ohio First Poster Conference.* Participated as a judge for seven Computer Science posters.
- *2025 Graduate Student Senate Graduate Student Research Symposium.* Participated as a judge for the Math, Physics, Aeronautics and Engineering, Computer Science category.
- *Kent Hack Enough 2025.* Participated as a judge for the General Track at the 13th annual Kent Hack Enough.
- *HacKSU – Former Leader and President.* Helped run the coding awareness club, HacKSU, at Kent State University. Responsibilities included teaching lessons each week as well as organizing the yearly Kent Hack Enough (KHE) Hackathon. 08/2019 – 09/2023.
- *Kent Hack Enough 2022.* Planned and organized the 11th annual Kent Hack Enough as the Lead Organizer. This event saw KHE's return to in-person hacking after the effects of the COVID-19 pandemic. Oversaw Sponsorship, Logistics, Management, and Design. Raised and handled over $15,000 in sponsorship funds. 10/15/2022 – 10/16/2022.
- *Kent Hack Enough 2021.* Worked as a Co-Lead Organizer for the 10th annual Kent Hack Enough. Oversaw Sponsorship, Design, Logistics, and worked on Code Development. Raised over $5,000 in sponsorship funds for prizes. 12/04/2021 – 12/05/2021.
- *Kent State Computer Science Department Curriculum Committee.* Joined the CS Curriculum Committee as the Undergraduate Student Representative for the Spring 2021 Semester. 01/2021 – 05/2021.
- *Kent Hack Enough 2020.* Worked as a staff member for the 9th annual Kent Hack Enough. Duties included helping judge submissions, being a mentor for hackers, and maintaining live code during the event. 10/24/2020 – 10/25/2020.

Student Mentoring/Advising

Summer Undergraduate Research Experience (SURE) 3 Minute Presentations

- Sherman, C. 2025. *Deriving Information from Saccades in Eye-Tracking Data.* [Poster]. 14 October, Kent State University.

Choose Ohio First (COF) Posters

- Weber, N., Higgins, P. 2023. *Enhancing Stereocode.* [Poster]. 2023 COF Poster Conference, 15 April, Youngstown State University.
- Ely, A., Pangonis, J., Chiudioni, G. 2023. *iTrace-Visualize.* [Poster]. 2023 COF Poster Conference, 15 April, Youngstown State University.
- Moder, N., Zellner, Z. 2022. *Algorithmic Approaches to Sudoku.* [Poster]. 2022 NE Ohio COF Poster Conference, 10 April, Cleveland State University.

Teaching

Undergraduate Teaching

Course Title	Role	Term(s)	Institution
CS II: Data Structures & Abstraction (CS 23001) – 86 students	Course Instructor	Fall '24	Kent State University
CS II: Data Structures & Abstraction (CS 23001) – 52 students	Lab Instructor	Spring '25	Kent State University
CS II: Data Structures & Abstraction (CS 23001) – 46 students	Lab Instructor	Fall '25	Kent State University