Brent Pappas

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Portfolio: https://www.pappasbrent.com
GitHub: https://www.github.com/PappasBrent

Education

Orlando, Florida — University of Central Florida (UCF)
August 2017 - May 2021 — Bachelor of Science - Computer Science; GPA: 3.849
Courses: Data structures and algorithms, Systems software, Programming languages, and Discrete structures

Orlando, Florida — UCF
August 2021 - Present — PhD - Computer Science; GPA: 3.975
Courses: Analysis of Algorithms, Complexity Theory, Computer Architecture, and Compiler Construction

Skills Summary

Languages: Python3, C/C++, Bash, and HTML/CSS/JavaScript
Tools: Git, GitHub, and LLVM/Clang
Platforms: Linux, Web, and Windows
Soft Skills: Leadership, Writing, Communication, and Time management

Experience

Orlando, Florida — UCF
August 2023 - April 2024 — Graduate Teaching Assistant
- **Teaching**: Led weekly labs on the Linux command line, the Linux C programming interface, git, make, and compiler design with ANTLR
- **Exam Proctoring**: Answered student questions during exams and monitored students to prevent cheating.
- **Performance Evaluations**: Link

Remote — Trail of Bits
May 2023 - August 2023, and December 2023 - January 2024 — Intern
- **C Language Toolsmithing**: Created Macroni, a C static analysis tool that combines Trail of Bits' tools PASTA and VAST to lower C preprocessor macros down to MLIR. Macroni is available at https://github.com/trailofbits/macroni.
- **Peer-reviewed Development**: Leveraged GitHub to push changes to company repos, submit code for code review, and finally merge changes into mainline branches.
- **Research Discussion**: Exhibited research results and Macroni to team members and company CEO, Dan Guido, for advice and criticism.

Orlando, Florida — UCF
July 2021 - July 2023, and May 2025 - Present — Graduate Research Assistant
- **Programming Language Research**: Stay up-to-date on the latest academic developments in programming languages.
- **Software Engineering**: Implement research ideas in languages such as C++.
- **Conduct Experiments**: Write Python and Bash scripts to automate running experiments.

Orlando, Florida — SP+
September 2019 - July 2021 — Quality Assurance Coordinator
- **Agile Software Development**: Engaged in agile software development methods within a small team to QA test software before moving on to later phases of development.
- **Testing Automation**: Refactored and wrote Python scripts to automate testing of various online user applications.
- **Mobile Application Development**: Tested company Android apps for compatibility with various versions of Android.

Orlando, Florida — UCF Student Academic Resource Center
August 2018 - December 2019 — Peer Mentor

- **Led Tutoring Sessions**: Led Computer Science 1 and Object Oriented Programming tutoring sessions involving Socratic learning methods.
- **Faculty Collaboration**: Collaborated with UCF teaching staff to enhance tutoring session quality.
- **Tutor Mentoring**: Observed other tutors' sessions and provided feedback as to how they may improve their communication and tutoring skills.

Projects

Macroni: A C static analysis tool that combines Trail of Bits' tools PASTA and VAST to lower C preprocessor macros down to MLIR. Macroni is available at https://github.com/trailofbits/macroni.

Maki: C++ Clang plugin that analyzes hows C preprocessor macros affect the C AST. Maki provides language porting tools information they can use to port macros to target languages in a way that preserves not just macro behavior, but also macro abstractions. Maki is the tool associated with 2024 ICSE paper, Semantic Analysis of Macro Usage for Portability, for which I am the lead-author.

Publications

Semantic Anaysis of Macro Usage for Portability: by Brent Pappas, and Paul Gazzillo. International Conference on Software Engineering (ICSE). Acceptance rate of 22.26% (234 / 1051). https://dl.acm.org/doi/10.1145/3597503.3623323.

Holy Macroni! A recipe for progressive language enhancement: by Brent Pappas. Blog post written for Trail of Bits. https://blog.trailofbits.com/2023/09/11/holy-macroni-a-recipe-for-progressive-language-enhancement/.

SugarC: Scalable Desugaring of Real-World Preprocessor Usage into Pure C: by Zach Patterson, Zenong Zhang, Brent Pappas, Shiyi Wei, and Paul Gazzillo. ICSE. Acceptance rate of 28.51% (197 / 691). https://dl.acm.org/doi/10.1145/3510003.3512763.

Presentations

Invited Talk - The PhD Life: Guest lecture on graduate student life presented to Dr. Suzanne Rivoire's undergraduate course, Computing Professions, at Sonoma State University. 2025-05-08. Slides link.

Semantic Analysis of Macro Usage for Portability (ICSE 2024): Presentation at the 2024 International Conference on Software Engineering in Lisbon, Portugal. 2024-04-17. Recording link.

Semantic Analysis of Macro Usage for Portability (CAE-R): Virtual presentation for Center of Academic Excellence in Cyber Research (CAE-R). 2023-08-31. Recording link; jump to 25:58.

Posters

Cpp2C: Transforming C Preprocessor Macros to C Language Constructs: 2022 University of Central Florida Student Scholar Symposium.

Holy Macroni! Finding Macro Usage Errors in the Linux Kernel: 2024 International Symposium on Secure and Private Execution Environment Design.

Honors and Awards

UCF 3MT Finalist (2024): For effectively communicating my research to a non-specialist audience in a 3 minute talk.

Distinguished artifact reviewer (0): For my attention to detail while reviewing artifacts for OOPLSA 2024. Link.

FCI Student Scholarship (2024): For my interest in interdisciplinary research, scholarship, and collaboration.

Cum laude honors (2021) (2021): For having a cumulative undergraduate GPA greater than 3.8.

Deans' list (2017-2021): For continued undergraduate scholastic achievement.

Burnett Honors Scholar (2017): For academic talent, motivation, intellectual curiosity and creativity.

Provost Scholarship (2017): For outstanding academic performance in high school.

Certifications

Level 2 College Readiness and Learning Assessment (CRLA) certified tutor.

UCF Student Enhancement Training (SET) program certified.

Volunteering

UCF Graduate School Info Session PhD Student Panel Orlando, Florida - May 2025

- **Guided undergraduates**: Answered undergraduate students' questions about UCF's Computer Science PhD program.

OOPLSA 2024 Artifact Evaluation Committee Member Virtual - January-February, July-August, 2024

- **Artifact Review**: Reviewed code artifacts associated with papers accepted to OOPLSA 2024. Distinguished reviewer.

NAC - NAPC Volunteer Orlando, Florida - May 2024

- **Competition Setup**: Moved computers and cables to the competition room for the 2024 North American Championship and Programming Camp (NAC-NAPC), hosted at UCF.

EuroSys 2023 Shadow Program Committee Member Virtual - November-December 2022

- **Paper Review**: Reviewed real paper submissions to EuroSys 2023.

Camp Connect Orlando, Florida - June 2021, June 2023, June 2025

- **Computer Programming Lessons**: Taught elementary, middle, and high school students the basics of computer programming in JavaScript.
- **Human Computer Interaction Lessons**: Gave elementary, middle, and high school students hands-on training with a variety of biometric equipment, including respiration belts, EDA and ECG sensors, fNIRS headbands, and eye-tracking sensors.

UCF CECS Senior Design Judge Orlando, Florida - April 2024

- **Judging**: Followed a given rubric to judge the quality of capstone projects for seniors of the College of Engineering and Computer Science. Criteria included presentation quality, project design quality, and creativity.

UCF CECS Career Kickoff Alumni Mentor Virtual - October 2022

- **Mentoring**: Advised UCF freshmen on goal-setting, resume-building, and overall professionalism.
- **Job Application Prep**: Conducted mock interview with UCF freshmen and provided tips on how to effectively search for jobs in their field.