

Brent Pappas

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EDUCATION

University of Central Florida (UCF)

Bachelor of Science - Computer Science; GPA: 3.849

Courses: Data Structures and Algorithms, Systems Software, Programming Languages, Discrete Structures

Orlando, Florida
August 2017 - May 2021

UCF

PhD - Computer Science; GPA: 4.000

Courses: Analysis of Algorithms, Complexity Theory, Computer Architecture, Compiler Construction

Orlando, Florida
August 2021 - Present

SKILLS SUMMARY

Languages: Python 3, C/C++, Bash, HTML/CSS/JavaScript, Go, Haskell, Coq, SQL

Tools: Git, GitHub, LLVM/Clang

Platforms: Linux, Web, Windows

Soft Skills: Leadership, Writing, Communication, Time Management

EXPERIENCE

Trail of Bits

Summer Associate

Remote
May 2023 - August 2023, December 2023

- **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.

UCF

Graduate Research Assistant

In-person/Remote
July 2021 - Present

- **Research in Programming Languages:** Stay up-to-date on the latest academic developments in programming languages.
- **Formal Methods:** Formulate theorems about programming languages and try to prove them using the Coq Proof Assistant.
- **Implement Ideas:** Implement research ideas in languages such as C++. E.g. a Clang plugin for transforming C preprocessor macros to C functions.
- **Run Experiments:** Write Python and Bash scripts to automate running experiments.

SP+

Quality Assurance Coordinator

In-person/Remote
September 2019 - July 2021

- **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 Testing:** Tested company Android apps for compatibility with various versions of Android.

Student Academic Resource Center of UCF

Peer Mentor

In-person
August 2018 - December 2019

- **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>.

C++2C: C++ Clang plugin that automatically transforms eligible C preprocessor macros into C functions. This enables other static analysis tools to analyze C programs without needing to preprocess them first and lose developer abstractions.

Chip-8 Emulator: An emulator of the Chip-8 virtual machine, written in C.

PUBLICATIONS

- Semantic Analysis of Macro Usage for Portability:** by Brent Pappas and Paul Gazzillo. International Conference on Software Engineering (ICSE), 2024. <https://doi.org/10.1145/3597503.3623323>
- SugarC: Scalable Desugaring of Real-World Preprocessor Usage into Pure C:** by Zach Patterson, Zenong Zhang, Brent Pappas, Shiyi Wei, and Paul Gazzillo. International Conference on Software Engineering (ICSE), 2022. <https://dl.acm.org/doi/10.1145/3510003.3512763>

PRESENTATIONS

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

POSTERS

- Cpp2C: Transforming C Preprocessor Macros to C Language Constructs:** Presented a poster on transforming C preprocessor macros to C functions at the UCF 2022 Student Scholar Symposium.

HONORS AND AWARDS

- Provost Scholarship from UCF.
- Member of the Burnett Honors College at UCF.
- On the Dean's List at UCF for all of undergraduate degree.
- Received Bachelor's degree with cum laude honors from UCF.
- College Readiness and Learning Assessment (CRLA) Level 1 certified tutor.
- CRLA Level 2 certified tutor
- UCF Student Enhancement Training (SET) program certified.

VOLUNTEER EXPERIENCE

- Camp Connect (at UCF)** Orlando, Florida - June 2021, June 2023
- **Teaching:** Taught elementary, middle, and high school students the basics of computer programming in JavaScript.
- UCF CECS Senior Design Judge** Orlando, Florida - April 2022
- **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** Orlando, Florida - 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.
- EuroSys 2023 Shadow Program Committee Member** Virtual - November-December 2022
- **Paper Review:** Reviewed real paper submissions to EuroSys 2023. My Reviews were not considered by the actual program committee, but this experience gave me great insight into how conference papers are reviewed.
- OOPLSA 2024 Artifact Evaluation Committee Member** Virtual - January-February 2024
- **Artifact Review:** Reviewed code artifacts associated with papers accepted to OOPLSA 2024.