Larry Darryl Lee Jr.

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Summary

An experienced software developer with a passion for mathematics, formal logic, and high quality software.

- Four years of professional experience developing programs in OCaml, with a extensive experience using JaneStreet's Core library and OCaml's foreign function interface (FFI).
- Over 15 years of professional programming experience
- Developed data models in the Social Sciences using OCaml
- Developed data analysis tools and libraries using OCaml
- Principal Developer for Kami Processor, the first open source RISC-V processor design formalized in Coq

For the past four years, I have been a senior software engineer and data analyst at Asemio, a data analytics and software development company. In this role, I led over 20 client-funded analysis projects, including:

I developed tools and methodologies for causal modeling, geospatial analysis, and privacy-preserving record linking.

Prior to Asemio, I was the principal developer for the Kami Processor, the first open-source RISC-V processor formalized in Coq, at SiFive. I also formally verified multiple algorithms embedded within SiFive's processor cores.

With 15+ years of professional software development experience, I have led high-visibility projects at Johns Hopkins University and Elucid Solutions, demonstrating my technical proficiency and professionalism.

Experience

Asemio — Tulsa, Oklahoma

Sr. Software Engineer — *2020 – 2024*

- Performed all of the statistical analysis for an ARPA funded project to measure food insecurity in Tulsa Oklahoma by analyzing emergency food providers
- Constructed a causal model to analyze the impact of the COVID pandemic on chronic absenteeism for Tulsa Public Schools
- Estimated housing insecurity amongst Tulsa Public School students and published these findings in a report that garnered the attention of the Tulsa Mayors office
- Developed a practical methodology and software for real-world privacy preserving record linking and applied this methodology to conduct over twenty sponsored research projects in four years
- Provided the data analysis, programming, and report writing for over twenty client-funded research projects

SiFive — San Mateo, California

Sr. Engineer — *2018 – 2020*

- Worked to develop the first formally verified, commercially available, RISC-V processor
- Principal developer for the open-source Kami Processor model
- Derived mathematical proofs verifying the correctness of components used within SiFive's S-series processors
- Contributed improvements to the Kami hardware modeling language
- Developed the Utila Kami library consisting of formally verified processor components

Elucid Solutions — Bethesda, Maryland

Sr. Programmer Analyst — *2015 – 2018*

- Attained the highest Contractor Performance Assessment Reporting System (CPARS) rating for the ACHP.gov project - including "exceptional" ratings for "quality," "schedule," and "management"
- Was instrumental in attaining CMMI level 3 certification for Elucid Solutions' software development practice
- Laid the foundation for data-driven management and evidence-based practice at Elucid Solutions by standardizing performance metrics, data collection, and analysis
- Increased Productivity at Elucid Solutions by developing a comprehensive knowledge management system that was used successfully for over three years
- Lead Developer for Elucid Solutions.com, Elucid Solution's corporate website

- Lead Developer for Lucidity, an open-source content publishing system
- Lead Developer for ASK, a website providing interactive lessons, user guides, and training tutorials for the General Services Administration
- Lead Developer for Abandoned Mines.gov the Federal Mining Dialogue's public website
- Lead Developer for ACHP.gov the Advisory Council on Historic Preservation's agency website

Johns Hopkins University — Baltimore, Maryland

Sr. Programmer Analyst — *2009 – 2015*

- Improved the quality of code produced by the Knowledge for Health Program at the Johns Hopkins School of Public Health by advocating for and implementing systematic unit testing across software development projects
- Improved the maintainability of software produced by the Knowledge for Health Program by introducing version control and automated documentation generation
- Lead Drupal developer for Popline the largest online database of reproductive health research articles
- Lead Drupal developer for mHealth Evidence an online database of journal articles related to mobile health interventions
- Developed connectors for importing records from Pubmed, Google Scholar, Scopus, and other large scholarly databases
- Created mobile apps for both Android and iPhone using PhoneGap and native Android APIs
- Assisted in the maintenance and development of the Center for Communication Programs, Knowledge for Health, and Urban and Reproductive Health websites

Please refer to my Portfolio Website for a more complete list of work experiences along with recommendations.

Skills

- Principal Developer for Kami Processor, the first open source RISC-V processor design formalized in Coq
- Over 15 years of professional programming experience
- Deeply knowledgeable about the theoretical foundations of Computer Science including Higher-Order Type Theory, Lambda Calculus, and formal logic
- Familiar with LISP and, in particular, the LISP dialect, Scheme
- Four years of professional experience developing programs in OCaml, with a extensive experience using JaneStreet's Core library and OCaml's foreign function interface (FFI).

Education

Goucher College — Towson, Maryland

Bachelors of Arts — *2008*

References

"I was Larry's supervisor at SiFive. There, he was instrumental in bringing up a formal specification of the RISC-V processor in Kami, which is a framework in Coq to specify hardware circuits using transactional semantics. The task was pretty complex, given the enormity of the RISC-V specification and the ability to understand, Kami, a new framework completely, in order to write programs in that framework. Larry was a quick learner and was highly motivated to perform this task. He paid a lot of attention to detail and had excellent software engineering skills - always coming up with unit test cases even for the smallest change made or feature added to the code base. Overall, I enjoyed working with Larry."

Murali Vijayaraghavan

"Working with Larry for nearly two years at SiFive I have come to know him as a man with a efficient and effective proof writing technique. As evidenced by his work in the ProcKami repository, he also shows the great attention to detail and forward planning one associates with well-written COQ code."

Anthony Machado

"Larry Lee [has] great knowledge of theorem proving as well as the ProcKami [RISC-V] processor. He was always the one I talked to when I had a question on how something worked in the ProcKami processor or a question on the Kami language semantics. It was really enjoyable working with Larry Lee while I was at SiFive."

Kenneth Roe