Sathyam Mohanram Vellal

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Seeking opportunities for Summer 2017 in Software and Computational Software Development

Education

University of Southern California, Los Angeles, CA   August 2016 - May 2018 (expected)
Master of Science (M.S.), Computer Science   Focus: Scientific Computing
Relevant Courses: Analysis of Algorithms, Methods of Computational Physics

PES University, Bangalore, India   August 2010 - June 2014
Bachelor of Engineering (B.E.), Computer Science & Engineering   Focus: Parallel Computing

Skills

Programming
- **Proficient In**   C/C++, Java, Python, JavaScript
- **Familiar With**   OpenMP, MPI, Matlab, OpenGL, Unity, MySQL, HTML/CSS, ES6, Node.js

Other Technologies
- **Proficient In**   Shell, Linux, Git, LaTeX
- **Familiar With**   MongoDB, Django, React-Native, Android, iOS, SVN

Applied Computer Sciences
- **Tools**   Mathematica, Matlab, SciPy
- **Theory**   Probability Theory, Monte Carlo Methods, Markov Chain, Procedural Content, Generative Music

Work Experience

PayPal Inc., Bangalore, India

Software Engineer   June 2014 - July 2016
Tags: C++, Java, JavaScript, Node.js, Android, iOS, React-Native
- Analysed and worked towards tapering false positives in detection of fraudulent transactions, directly impacting annual revenue, and brought in customer insights which were used to refine and enhance fraud detection models.
- Design, implementation and support of the Free Return Shipping web flows, both activation and product experiences.
- Design and implementation of a multi-faceted Mobile Wallet solution for the Telcel Pay and Claro Pay white-label apps.
- Also involved in realisation of product design, enhancements and support to other products, technical support during events.

Software Engineer Intern   Jan 2014 - June 2014
Tags: JavaScript, Node.js
- Analysis and research of the existing (at the time) Payouts Experience (known as MassPay).
- Prototyped and contributed to the Next-Gen Payouts Experience with enhanced UX and modern webtools on the Node.js stack.

Boost C++ Libraries, (done remotely)

Contract Developer, Google Summer of Code   June 2013 - Aug 2013
Tags: C++, OpenMP, Parallel Programming, Vectorisation
- Developed a new aligned memory allocator and modified core functionality of the library to enable auto-vectorisation.
- Implemented efficient BLAS routines, like GotoBLAS Matrix-Matrix multiplication and more, to boost library's performance.
- With benchmarks using standard algorithms, captured the increase in library's performance from my contributions.

Student Nokia Developer, PES University, Bangalore, India

Application Developer   June 2011 - Aug 2011
Tags: Qt platform, Java, JavaScript, Game Development, Artificial Intelligence
- Built a two-player and a four-player game based on the traditional Indian game of "Chowka Baara" with a robust computer gameplay for the Symbian platform. The game was among the Top 10 new releases for the month (at the time).
- Was also part of the small-scale innovation team, working on mobile apps for low-end Nokia devices (devices with keypad).

Selected Project Experience

Logic Inference Engine, University of Southern California, Los Angeles, CA

Author   November 2016

Tags: Python, First Order Logic
- Built an inference engine based on first-order logic, to take in a set of rules/sentences as input, and breakdown the rules to build a Knowledge Base, which then can be queried with sentences for truths in that world.
- The inference engine, at first, simplifies every rule into CNF and uses the resolution by refutation algorithm.

Smart Personal Assistant, PES University, Bangalore, India

Co-Author   Jan 2014 - May 2014

Tags: Android, Artificial Intelligence, Machine Learning, Natural Language Processing
- Developed a self-learning intelligent mobile assistant to assist users with common-tasks in day-to-day activities.
- The assistant detected and prioritised important SMS and Emails, by accommodating to user's schedule.
- It tracked SMS and Emails to automatically log and mark potential event information in the user's calendar.
- The assistant also featured "Smart Alarms", to find best possible time to set alarms based on the user's calendar and sleep time.

Enhancing 0 A.D. Gameplay AI, Open Source (done remotely)

Author   Aug 2013 - Dec 2013

Tags: C++, JavaScript, Game Development, Artificial Intelligence
- Contributed to 0 A.D - an Open Source Historical RTS game. The contributions made, and results obtained were also submitted as the required course project for the "Architecture of Open Source Technologies" course.
- Contributed to the runtime simulation of the AI Bot for the game to improve its "thinking" abilities.
- Enhanced the AI for better military, economic and attacks decision making. Also improved opening strategies.

PyOMP, PES University, Bangalore, India

Co-Author   Aug 2013 - Dec 2013

Tags: Python, OpenMP, Parallelisation
- Using decorators, built a module for introducing OpenMP-like directives for Python, similar to that of C++, with the intention to provide a simpler interface for parallel programming in Python.
- Implemented $Parallel, Single, Task, For$ and $Section$ directives of OpenMP, along with specifying no. of threads.
- Using benchmarks with standard algorithms, measured performance and found it to be promising at significantly large inputs.

Software Machine Simulator, PES University, Bangalore, India

Author   Aug 2012 - Nov 2012

Tags: Compiler & Language Design, ASM, Python, Qt
- For academic purposes, developed a simple architecture specification, an assembly language specification for the architecture and a machine simulator to run any assembled code for the assembly language.
- The architecture featured processor registers, storage registers, flags, a small cache and memory. The assembly language specification featured over twenty operations to be able to perform general computations and operations.
- The simulator and the assembly language specifications were used as tools for teaching Compiler Design and to also help build simple high level programming languages that would compile to these specifications, for understanding language design.

Awards and Honours

Distinction Awards, PES University, Bangalore India
- Obtained Distinction Awards for all semesters during undergraduate studies.

Hackathons, PayPal Inc., Bangalore India
- Winner of the Small Business Challenge, in Dec. 2015.
- Runner up of the Consumer Org Product Hackathon, in Aug. 2015
- Winner of the Global Product Hackathon, in Dec. 2014.
- Winner of the PayPal Web Design Contest, in Aug. 2014.