Venkata Saikiranpatnaik Balivada

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EDUCATION

University of Wisconsin, Madison — Madison, WI
Masters in Computer Science - 3.92/4 — *Sep 2022 - Present*
Featured Courses: *Math for ML, Quantum Algorithms, Big Data Systems, Program Synthesis, Distributed Systems*

Indian Institute of Technology, Delhi — New Delhi, India
Bachelors in Computer Science - 9.37/10 — *Jul 2014 – May 2018*
Featured Courses: *Spectral Graph Theory, Advanced OS, Compiler Design, ML, AI, Databases, Blockchain*

EXPERIENCE

YugaByteDB — Sunnyvale, CA
Software Engineer Intern — *May 2023 - Present*
- **Languages & Relational Technologies**: Worked on improving the performance of the query/postgres layer of an ever growing and popular distributed database - YugaByteDB

Marlin Labs — Bengaluru, India
Software Engineer — *Jul 2021 - Jun 2022*
- **Blockchain**: Worked as a blockchain developer primarily on MEV extraction and peer-peer network simulations.

Tower Research Capital — Gurgaon, India
Software Engineer — *Jul 2018 - Jun 2021*
- **Market Data Core**: Worked on design, development, and maintenance of both the trading stack client-side library as well as several applications that are primarily based on market data and sometimes deal with order entry.

PROJECTS

- **Distinct Pushdown**: Improved the performance of distinct queries by generating index scans that return distinct prefixes of the index in the planner/optimizer phase. The scan seeks fewer rows from the underlying storage layer and consumes much lower network bandwidth on the link between the query and the storage layers. Updated the cost model to generate more accurate plans for distinct queries. (2023)

- **Marius Script**: Designed and developed Marius Script, a new message passing interface to simplify the development of Graph Neural Network modules on MariusGNN, a state-of-the-art GNNs framework. (2022)

- **Tak Bot**: Used adversarial algorithms to develop an AI bot that plays Tak. Like chess, the game is sequential, deterministic and played by two. Ranked 4th in class. (2016)

- **Trade reply path optimizations**: Identified and implemented several optimizations such as improving division performance, enhancing map inserts, and eliding unnecessary virtual calls. (2019)

- **Shared Memory Multi-reader support for sniffed links**: Added support to publish sniffed network data over shared memory. This allows multiple clients to consume the inbound network traffic without the overhead of reading the same data redundantly over the PCIe. (2020)

- **Optimizing the performance of memory-intensive applications**: Designed and developed a proof of concept for a custom memory allocator that benefits from the efficient cache usage of 32-bit wide pointers. Unlike the x32 ABI, the applications are not capped by the 4GB virtual memory limit. This is achieved with minimal runtime overhead. (2018)

- **JqExpress**: Designed and developed JqExpress, a jq parse expression synthesizer. JQ is a popular command line utility that allows transformation, selection and query of JSON streams. JqExpress synthesizes JQ DSL using input-output examples.

- **Client Stack Python offering**: Initiated a project that offers our client-side C++ library in Python. Overcame various challenges relating to object ownership and pythonization of the C++ code. (2021)

- **Metadata framework**: Designed and developed an application layer protocol and framework to produce/consume essential metadata. Trading clients require this metadata to accurately interpret the inbound market data traffic. (2019)

- **P2P Network Simulator**: Developed a peer-to-peer network simulator to compare the latency and bandwidth performance of an in-house protocol with that of the floodsub and gossip protocols. (2022)

AWARDS & HONORS

- Received semester merit awards on multiple occasions for being in the top 7% of my undergraduate class. Ranked top 5 in the department.

- Secured a top 100 rank in the JEE Advanced examination. More than a million candidates attempt the JEE set of examinations every year.

- Awarded certificate of merit for scoring in the top 1% of the National Standard Examination in Physics.

PROGRAMMING SKILLS

- **Languages**: C++, Python, Go, CMake, SQL
- **Technologies**: DGL, PyTorch, Mellanox ibverbs, Protocol Buffers, Pybind11