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Saubhik Mukherjee
Compiler Engineer

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Employment

Senior Software Engineer
Low-level kernel compiler

SambaNova Systems, Inc.
Palo Alto, CA, USA

May 23, 2022 - Present (3 yrs 2 mths)

- Developed MLIR & LLVM-based compiler layers & tools to transform, optimize, debug, execute LLM kernels on proprietary dataflow CGRA accelerator; optimized compiler passes for lowering embedded DSL programming for memory & compute unit abstractions; improved compilation time; robustness & performance testing of new h/w features;
- Developed patented tech for on-chip debugging capabilities to set breakpoints during dataflow execution to print on-chip tensors for accuracy & performance debugging crucial during new model bringup & customer issues
- *Tools*: C++, Clang, MLIR, LLDB, Integer Set Library, Z3 Prover, Bazel, cmake, ninja, gperf, perfetto, tmux, clangd, Synopsys VCS

Software Engineer
Machine Learning (ML) systems

AlpacaJapan, Co. Ltd.
Tokyo, Japan

Jan 1, 2019 - Jan 8, 2021 (2 yrs)

- Designed, developed, maintained, & tested production stock price prediction system, leading to 20% improvement in model deployment efficiency; developed workflows for fast production recovery reducing downtime by 30%
- Managed installation & maintenance of new OHLCV data sources & developed the data platform used for ML model R&D, resulting in a 25% reduction in data acquisition & processing time
- Collected & documented client requirements for future releases & made extensible & robust software design decisions for developing server & client web apps, contributing to a 10% annual revenue growth
- *Tools*: Python, React, JavaScript, Flask, PostgreSQL, SQLAlchemy, Alembic, Kubernetes, Docker, PyTorch, P&as, NumPy, SciPy, Luigi, CircleCI, Argo CD, Auth0, Datadog

Data Scientist
ML in pricing research

Anheuser-Busch InBev
Bangalore, India

Jun 19, 2017 - Dec 28, 2018 (1 yr 6 mths)

- Developed ML (multinomial logit, neural nets) models to estimate ABInBev's market share & revenue in different pricing scenarios of beer SKUs across multiple countries, using R & Python; developed game-theoretic techniques & numerical optimization algorithms (Nelder-Mead, BFGS, Simulated Annealing) based on pricing analysis results to maximize business KPIs; created UI dashboards for consuming model reports, using Shiny, RStudio

Internships & Research

Graduate Research Assistant
Networked Systems

Georgia Institute of Technology
Atlanta, GA, USA

Aug 23, 2021 - May 7, 2022

- **First author** (ORCID) of "Understanding QUIC's Throughput Speedbumps". Published in *ACM Applied Networking Research Workshop* (ANRW '25). DOI: 10.1145/3744200.3744780
- Developed *QuicNIC*, a software NIC to accelerate the QUIC stack, to move segmentation, pacing, & encryption from the application to a dedicated core implementing software NIC functionality; achieved TCP-like single-connection throughput.
- Ported Meta's production QUIC (network protocol) implementation, mvfst (& dependencies folly, fizz), to rely on the efficient kernel-bypass network stack (custom threading & socket libraries) APIs provided by MIT's Shenango (caladan) & achieve low tail latency & increase CPU efficiency; involved CPU profiling using flame graphs

Open Source Contributor
The Linux Foundation

Google Summer of Code

Jun 7, 2021 - Aug 23, 2021

- Analyze & fix race condition bugs in the Linux Kernel 5.4 device drivers based on software verification static analyzer checker, Klever. Accepted patches to kernel mainline. *Skills*: Linux kernel development, C

Education

- **Master of Science in Computer Science** — **Jan 2020 - May 2022**
  - **Georgia Institute of Technology, USA**
  - *Major*: Computer Science, *Concentration*: Computing Systems. *GPA*: 4.00; transcript link
- **Master of Science in Quantitative Economics** — **Jul 2015 - Jun 2017**
  - **Indian Statistical Institute, India**
  - Passed in *First Division with Distinction*; transcript link
- **Bachelor of Science in Mathematics & Computer Science** — **Aug 2012 - Jul 2015**
  - **Chennai Mathematical Institute, India**
  - *GPA*: 06.93 (out of 10); transcript link