Vignesh Nanda Kumar

Contact Information

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Education

Masters in Computer Science and Engineering, University of California San Diego — *expected Jun '23*
B.E. (Hons.) Computer Science, Birla Institute of Technology and Science, Pilani — *Jun '19*
CGPA: **9.98/10.00** — Silver Medalist of 2019 batch

Professional Experience

AI Labs, American Express (Amex) — **Bengaluru, India**
Research Engineer — *Jul '19 - Jul '21*

- Collaborated with a team of 7 developers to maintain features for AXGBoost algorithm according to business user requirements pertaining to model building, scoring and printing across **4 release cycles**.
- Extended support for **GPU model building, distributed multi class, and custom min child weight** along with extensive **unit and functional testing** for the new version of AXGBoost algorithm.
- Formulated a distributed random sampling algorithm which reduced the time taken for summarising data (**upto 4x on UCI datasets**) while maintaining model performance of distributed XGBoost algorithm.
- Conceptualized a search tool that enables enterprise-wide context-aware search which got selected in **top 5 among 20 ideas in AI Labs Ideation Workshop**.

Research Intern — *Jan '19 - Jun '19*

- Designed the class architectures and overhauled the distributed AXGBoost algorithm for better maintainability from a **2400+ lines code base to <500 lines** in C++ (users have built **10,000+ models**).
- Improved the Approximate Split Point Proposal Algorithm used in distributed AXGBoost, which **improved the capture rate on Amex datasets by 4%**.
- Inherited functionality from XGBoost to **remodel CSV data reading** in AXGBoost along with additional support for column distributed data reading.

Goldman Sachs — **Bengaluru, India**
Summer Analyst — *May '18 - Jul '18*

- Implemented a **pluggable parallel email scanner** for shared mailboxes which enables easy access to conversations that happened for a deal, using Java Spring Framework and Microsoft Exchange Services.
- Devised an **end-to-end pipeline** to set up queues for storing mails at intermediate steps, processing mails to remove redundant information, and finally storing the structured mails in MongoDB.

Gnowledge Lab, Homi Bhabha Centre for Science Education (HBCSE) — **Mumbai, India**
Summer Intern — *May '17 - Jul '17*

- Developed a **search engine** using Django and integrated it with a digital learning platform (CLIx) to enable quick content access in schools with no internet connectivity (**deployed in 500 government schools**).
- Innovated on the **triplet search functionality** to exploit the inherent structure of data stored in the form of subjects, attributes and relations.

Projects

Parallelization of K-Medoids Clustering Algorithm — *Aug '18 - Dec '18*

- Implemented a parallel K-Medoids algorithm using Adaptive Gridding in Java Spark, which improved the algorithm's **efficiency of selecting medoids (improved 10x)** without compromising on the clustering error.

Parallelization of Union-find Algorithm — *Jan '18 - May '18*

- Optimized the distributed Union-find algorithm by **reducing the message passing operations(15% reduction)** between processes using deferred bulk updates. Implemented the algorithm using OpenMP in C++.

Foster's Design Methodology on a Range-Queryable Distributed Data Structure — *Apr '18 - May '18*

- Designed a distributed algorithm using Foster's Design methodology having **logarithmic speedup** compared to sequential algorithm which facilitates joining and leaving of peers in a peer-to-peer network.

Compiler for C-Like Language — *Jan '18 - Apr '18*

- Built the **lexical, syntax, semantic analyzers, and code generator modules** of a compiler for a language in C along with supporting functionalities for executing functions, matrix operations, and conditional statements.

Word Document Index for Shared Memory Systems — *Jan '18 - Feb '18*

- Created a parallel algorithm for word document index creation using OpenMP in C++ for a file system with 200k files; reduced index creation time from **43 seconds on 1 CPU core to 9 seconds on 32 CPU cores**.

Technical Skills

C, C++, Java, Python, R, Scala, Scheme, MPI, OpenMP, Spark, Django

Awards and Extra Curricular

- **Drives Results Award**:Awarded in the AI Labs town hall at Amex for my contribution to AXGBoost. *Feb '21*
- Volunteered to take **English lessons virtually for 40 security guards** at Amex. *Feb '21*
- **Google AI Summer School** AI for Social Good Track: among the 50 students selected for the school. *Aug '20*
- Planted tree saplings as part of a **Tree Plantation Drive** by American Express. *Aug '19*
- **BITS Merit Scholar**: Received 80% Scholarship for being in the top 1% in all semesters. *Aug '15 – Jun '19*
- Volunteered to teach underprivileged kids as part of **Community TeamWorks**(Goldman Sachs). *Jun '18*