

Konstantinos Konstantinidis

Ph.D., Iowa State University

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SKILLS

Proficient: Python • Java • AWS • MATLAB • PyTorch • MPI • MapReduce

Good: C++ • SQL • Hadoop • NumPy • Bash • Git • Jenkins

EDUCATION

Iowa State University

Ph.D., Electrical and Computer Engineering, GPA: 3.94/4, Advisor: Prof. Aditya Ramamoorthy.

Ames, IA

Dec. 2022

Technical University of Crete

Diploma (5-year program), Electrical and Computer Engineering, GPA: 3.4/4, Advisor: Prof. George Karystinos.

Chania, Greece

Dec. 2016

INDUSTRY EXPERIENCE

Software Engineer at C3 AI | Java, Python, IntelliJ IDEA, OpenSearch.

Redwood City, CA | 09/2022 – Present

I am a member of the Platform - Data team developing C3.ai's *feature store* system that stores machine learning data. My work involves alleviating bottlenecks identified through algorithmic analysis and profiling (e.g., YourKit) across the data pipeline, hence improving the latency of feature serving and enabling the system to scale distributively across multiple nodes.

Software Engineer Intern at Meta (Facebook) | Python, PHP, SQL, C++.

Menlo Park, CA | 05/2022 – 08/2022

Developed debugging tools for machine learning feature authoring used in Facebook Marketplace. The implemented framework categorizes errors during feature compilation, generates alerts, and assigns tasks to the appropriate team; I integrated it with the CI/CD. Another end product of my work was a UI tool to retrieve and transform feature values from low-latency storage.

Software Engineer Intern at C3 AI | Java, Python, AWS, Jenkins, Splunk.

Redwood City, CA | 06/2021 – 08/2021

Implemented a framework for cluster failure prediction; its first component is the data pipeline which loads cluster health metrics, handles missing data, and creates a training data set. The second component is the ML pipeline which trains a model and predicts the cluster's state using streaming data. Followed the process of continuous integration / continuous deployment (CI/CD).

RESEARCH PROJECTS

ByzShield: Robust distributed learning | Python, PyTorch, AWS, MPI, Bash.

01/2020 – 04/2021

Developed a defense for distributed learning in which computing devices may return erroneous or malicious gradients. The method achieves a **20%** increase in top-1 accuracy on the **CIFAR-10** dataset and a **36%** reduction in the fraction of corrupted gradients.

CAMR: Aggregated MapReduce over multiple jobs | Python, AWS, MPI, Bash.

12/2018 – 04/2020

Proposed a method named *CAMR*, which reduces the MapReduce communication overhead when the desired functions can be aggregated (amenable to deep learning applications). It achieves state-of-the-art communication load but with an exponentially smaller requirement on the minimum number of jobs. Its speedup is **4.3×** over the baseline approach.

Staggler mitigation in matrix multiplication

07/2018 – 01/2019

Proposed and implemented a technique to tolerate the presence of servers that suffer from slow computation. Our algorithm can alleviate a higher number of slow servers and requires **80%** of the time needed by prior methods on actual AWS EC2 simulations.

MapReduce communication load reduction | C++, AWS, MPI, Hadoop, HDFS, Bash.

05/2017 – 12/2018

Proposed an algorithm to reduce **MapReduce** communication load; it uses *Single Parity Check* codes and design theory to assign tasks to servers and splits files less finely than prior work. Tweaked the **TeraSort** algorithm (to sort data sets in **HDFS**). The method uses **MPI** for communication. It supersedes the state-of-the-art by **2.6×** and the baseline approach by **4.7×** on AWS EC2 clusters.

SELECTED AWARDS

- **Best Student Poster Award**, Midwest Machine Learning Symposium (MMLS), June 2019 ([link](#)).
- **Teaching Excellence Award**, Iowa State University, May 2019.

SELECTED PUBLICATIONS ([GOOGLE SCHOLAR](#))

- **K. Konstantinidis** and A. Ramamoorthy, "Aspis: Robust Detection for Distributed Learning," *IEEE International Symposium on Information Theory (ISIT)*, June 2022.
- **K. Konstantinidis** and A. Ramamoorthy, "ByzShield: An Efficient and Robust System for Distributed Training," *Machine Learning and Systems (MLSys)*, April 2021.
- **K. Konstantinidis** and A. Ramamoorthy, "Resolvable Designs for Speeding up Distributed Computing," *IEEE/ACM Transactions on Networking (ToN)*, August 2020.
- L. Tang, **K. Konstantinidis** and A. Ramamoorthy, "Erasure coding for distributed matrix multiplication for matrices with bounded entries," *IEEE Communication Letters (COMML)*, November 2018.
- **K. Konstantinidis** and A. Ramamoorthy, "Leveraging Coding Techniques for Speeding up Distributed Computing," *IEEE Global Communications Conference (GLOBECOM)*, December 2018.