Kefu Lu

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Research Interests

Approximation algorithms, parallel and distributed computing, online scheduling, large scale data analysis, machine learning

Education

Carnegie Mellon University | 2018-2019

Visiting Research Student

Washington University in St. Louis | 2014-2019

Ph.D. in Computer Science

Advisor: Angelina Lee

Washington University in St. Louis | 2010-2014

Bachelor of Art in Physics and Computer Science

Professional Experience

Washington and Lee University | 2019 – present

Assistant Professor of Computer Science

Sandia National Laboratories | 2018

R&D, Graduate Level

Teaching

Assistant Professor | Washington and Lee University | 2019 – Present

- **Fundamentals of Programming (CSCI 111).** Fall 2019-2021, Fall 2023, Winter 2020-2022. Introductory course in Computer Science for majors and non-majors. Introductory techniques in problem solving, software design, and algorithms.
- **Fundamentals of Programming II (CSCI 112).** Winter 2023. This is an intermediate course in Computer Science for majors and minors. The course focuses on the implementation of data structures and algorithms with an emphasis on efficiency, Big-O notation, and time-space trade-offs.
- **Algorithm Design and Analysis (CSCI 211).** Winter 2020-2024.
  Advanced course on algorithmic problem solving. Topics include algorithm analysis,

dynamic programming, divide and conquer, network flow, computational intractability and approximation.

- **Theory of Computation (CSCI 313).** Fall 2021. Fall 2023. Fall 2024.
  Advanced course in theoretical computer science. Course content covers complexity theory, including various theoretical models of computation such as Finite Automata, Pushdown Automata, Turing Machines, and their relationship to formal languages. The issue of decidability and the P vs NP problem are also discussed in detail.
- **Parallel Computing (CSCI 320).** Fall 2020. Winter 2024.
  Advanced course on parallel programming and parallel algorithms. Topics include programing for multiprocessor computers with POSIX threads and OpenMP, analysis of parallel algorithms, and a survey of common parallel algorithms.
- **Cloud Computing (CSCI 326).** Spring 2022.
  Advanced course on cloud computing. Students interacted with Amazon Web Services and developed Big Data applications through Apache Spark. Other significant topics include the architecture for Cloud Systems, the development programs in the Cloud, and the design of algorithms in distributed systems.

Publications

In theoretical computer science, author names are ordered alphabetically by convention. Exceptions are footnoted.

- Kefu Lu and Mason Marchetti
  Maximizing Throughput for Parallel Jobs with Speed-up Curves
  Workshop on Approximation and Online Algorithms (WAOA 2024. Accepted)
- Thomas Lavastida, Kefu Lu, Ben Moseley and Yuyan Wang
  Scaling Average-Linkage via Sparse Cluster Embeddings
  Asian Conference on Machine Learning (ACML 2021)
- Jeremy Buhler, Thomas Lavastida, Kefu Lu, and Ben Moseley
  A Scalable Approximation Algorithm for Weighted Longest Common Subsequence
  European Conference on Parallel and Distributed Computing (Euro-Par 2021)
- Silvio Lattanzi, Thomas Lavastida, Kefu Lu and Ben Moseley
  A Framework for Parallelizing Hierarchical Clustering Methods
  European Conference on Machine Learning (ECML-PKDD 2019)
- Kunal Agrawal, I-Ting Angelina Lee, Jing Li, Kefu Lu, and Ben Moseley.
  Practically Efficient Scheduler for Minimizing Average Flow Time of Parallel Jobs
  IEEE International Parallel and Distributed Processing Symposium (IPDPS 2019)

- Kunal Agrawal, Jing Li, Kefu Lu, and Ben Moseley
  Scheduling Parallel Jobs to Maximize Throughput
  In the 13th Latin American Symposium on Theoretical Informatics. (LATIN 2018).

- Shamoli Gupta, Ravi Kumar, Kefu Lu, Ben Moseley, and Sergei Vassilvitskii
  Local Search Methods for *k*-means with Outliers
  In Proceedings of the International Conference on Very Large Databases (VLDB 2017)

- [1]Gustavo Malkomes, Kefu Lu, Blakeley Hoffman, Roman Garnett, Benjamin Moseley and Richard Mann
  Cooperative Set Function Optimization Without Communication of Coordination
  In Proceedings of the International Conference on Autonomous Agents and Multiagent Systems (AAMS 2017)

- Kunal Agrawal, Jing Li, Kefu Lu, and Ben Moseley
  Scheduling Parallelizable jobs Online to Minimize Maximum Flow Time
  In Proceedings of the 28th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2016). Brief Announcement

- Kunal Agrawal, Jing Li, Kefu Lu, and Ben Moseley
  Scheduling Parallel Jobs to Maximize Throughput
  In Proceedings of the 29th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2017).

- Shaurya Ahuja, Kefu Lu, and Ben Moseley
  Partitioned Feasibility Tests for Sporadic Tasks on Heterogeneous Machines
  In Proceedings of the 30th IEEE International Parallel and Distributed Processing Symposium (IPDPS 2016)

- Kunal Agrawal, Jing Li, Kefu Lu, and Ben Moseley
  Scheduling Parallel Jobs to Maximize Throughput
  In Proceedings of the 27th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2016).

- Kunal Agrawal, Jeremy Fineman, Kefu Lu, Brendan Sheridan, Jim Sukha, Robert Utterback
  Provably Good Scheduling for Parallel Programs that use Data Structures through Implicit Batching
  In Proceedings of the 26th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA 2014)

[1]Authors not ordered alphabetically.