Sharmila Duppala

email: *sduppala@umd.edu* website:sharmila-duppala.com Github: @trinity24 Phone: +1 (516)-669-6750

EDUCATION

University of Maryland, College Park, Maryland, USA — Aug 2019–Present
Ph.D. in Theoretical Computer Science and Fairness in AI, Department of Computer Science

Stony Brook University, New York, USA — Jul 2017–May 2019
M.S. (Thesis), Department of Computer Science

National Institute of Technology Surat, Gujarat, India — Jul 2012–May 2016
B.Tech. (Hons.), Department of Computer Engineering

PUBLICATIONS

Fair labelled Clustering
Seyed Esmeili, Sharmila Duppala, Brian Brubach, John P. Dickerson
KDD 2022

Data Races and the Discrete Resource-time Tradeoff Problem with Resource Reuse over Paths
Rathish Das, Shih-Yu Tsai, Sharmila Duppala, Jason Lynch, Ester Arkin, Rezaul Chowdhury, Joseph Mitchell and Steven Skiena
SPAA 2019

Improved MapReduce Load Balancing through Distribution-Dependent Hash Function Optimization
[abc] Zafar Ahmad, Sharmila Duppala, Rezaul Chowdhury, Steven Skiena
ICPADS 2020

Online minimum matching with uniform metric and random arrivals
[abc] Sharmila Duppala, Karthik Sankararaman, Pan Xu
Operations Research Letters 2022

Rawlsian Fairness in Online Bipartite Matching:Two-sided, Group, and Individual
Seyed Esmeili, Sharmila Duppala, Vedant Nanda, John P. Dickerson, Aravind Srinivasan
AAMAS 2022 (Extended abstract)

Group Fairness in Set Packing Problems
Sharmila Duppala, Juan Luque, John P. Dickerson, Aravind Srinivasan
Under Submission at NeurIPS 2022

Algorithms for online matching under random order with degree-dependent competitive ratios
Sharmila Duppala, Pan Xu
Under Submission at NeurIPS 2022

RESEARCH EXPERIENCE

Ph.D. Student, University of Maryland, College Park — Aug 2019–Present
Algorithmic Fairness and Stochastic Models for Combinatorial Optimization — Prof. John Dickerson, Prof. Aravind Srinivasan
Worked on formulating notions of fairness, translating them into rigorous mathematical objects, and incorporating them in classical algorithmic problems. Specifically, fairness in hypergraph matching, online matching, maximum coverage, clustering and kidney exchange markets and the interplay of fairness and stochasticity, with emphasis on how the latter can ensure socially fair algorithmic solutions.

Masters Thesis , Stony Brook University — Jul 2017–May 2019
Optimizating two systems employing reducers — Prof. Rezaul Chowdhury
Designed approximation algorithms for the *Space-Time Trade-off Problem* in parallel programs that can simultaneously optimize the memory utilization and the makespan of series-parallel graphs and computational Directed Acyclic Graphs (DAGs).

KEY COURSES

Graduate Level: Quantum Computing, Advanced Probability Theory, Mechanism Design for Social AI, Algorithmic Lowerbounds, Advanced Algorithms, Computational Geometry, Discrete Mathematics, Computer Vision, Operating Systems, Network Security

Data Science: Deep Learning Theory, Advanced Numerical Optimization, Algorithms in Machine Learning

POSITIONS OF RESPONSIBILITY

Graduate Teaching Assistant Jul 2017–Present
Served as a Discussion Leader and responsible for teaching Object Oriented Programming, Analysis of Algorithms, Computer Systems and Discrete Structures during different semesters.

Organizer, CATS (Capital Area Theory Seminar) Aug 2021–May 2022
Responsible for organizing CS theory talks and inviting speakers.

Curriculum Designer and Instructor, Girls Talk Math Aug 2021–Jun 2021
Responsible for designing curriculum on undergraduate mathematics topics like Group Theory, Network Theory and Quantitative Finance for high school students and conducting educational camps.

KEY PROJECTS

Comparing the efficacy of different data-preprocessing techniques in fair classification, University of Maryland Prof. Soheil Feizi
Compared the performance of recent data preprocessing techniques in fair classification (eg. Clustering) like data (reweighing techniques (RW), learning fairness representations (LFR), optimized preprocessing(OP)) under the fairness metric "statistical parity" using open source toolkit AI Fairness 360 on standard data sets available.

Operating Systems, Stony Brook University Prof. Michael Ferdman
Built a pre-emptive, multi-tasking Operating System from scratch. Implemented demand-paging, copy-on-fork and auto-growing stack functionalities. Created a compatible standard library and bash-like shell to interact with the OS.

Computational Geometry, Stony Brook University Prof. Joseph Mitchell
The alpha-fatness and chord-arc scores are different measures of the "niceness" of polygons. They may prove useful in developing quantitative measures by which electoral districts may be determined illegal. This project includes software for implementing these measures together with preliminary results on random polygons.

Energy Consumption Prediction, Stony Brook University Prof. Zhenhua Liu
Predicting an year's electricity consumption using the electricity consumption of previous year, time series data at 15min interval for 365 days. Implemented SARIMA, SVM and LSTM models using PyTorch and compared the results for 10 homes. Also enhanced the predictions using smart meter data for various appliances of the same homes.

TECHNICAL SKILLS

Programming Languages: C, C++, Java, Python, SQL, PL-SQL, MATLAB, Prolog, Qiskit
Platforms/Tools: Linux, Windows, GDB, Eclipse, QEMU, Processing
Libraries for Machine Learning: PyTorch, Numpy, Keras, TensorFlow, Jupyter Notebook

ACADEMIC AWARDS

Chair's Fellowship, University of Maryland, College Park
TCS (Theoretical Computer Science) Women Scholarship STOC-2018
ACM Travel Scholarship SPAA-2019
TCS (Theoretical Computer Science) Women Scholarship STOC-2019

REFERENCES

Prof. Aravind Srinivasan, University of Maryland, College Park email: *srin@cs.umd.edu*
Prof. John Dickerson, University of Maryland, College Park email: *johnd@umd.edu*
Prof. Rezaul Chowdhury, Stony Brook University email: *rezaul@cs.stonybrook.edu*