Sharmila Duppala

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EDUCATION

University of Maryland, College Park, Maryland, USA — Aug 2019–Present
M.S./ Ph.D., Department of Computer Science

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

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

RESEARCH EXPERIENCE

Ph.D. Student, University of Maryland, College Park — Aug 2019–Present
Algorithmic Fairness, and Stochastic Models for Combinatorial Optimization — **Prof. John P. Dickerson, Prof. Aravind Srinivasan**
Worked on PAF (Probabilistically Approximately Fair) algorithms for combinatorial problems. Specifically designed and analyzed randomized algorithms to ensure fairness in various combinatorial problems like graph matching, set packing, set covering, and clustering problems with real-world applications.

Masters Thesis , Stony Brook University — Jul 2017–May 2019
Memory and makespan tradeoff in parallel programs — **Prof. Rezaul Chowdh ury**
Worked on a resource allocation problem that arises in scheduling parallel programs. Specifically worked on designing bi-criteria algorithms for allocating memory to optimize work and makespan simultaneously.

INTERNSHIP EXPERIENCE

Applied Scientist Internship , Optum Labs — Jun 2023–Aug 2023
Deep representation learning for partially annotated multi-label clustering of medical dialogues. — **Dr. Carlos W. Morato**
Designed and implemented a neural model for learning cluster representations for multi-labeled dialogue data. Also developed a scoring metric to map multi-label dialogue to uni-labeled segments of dialogue.

Summer Research Internship, New Jersey Institute of Technology — Jun 2023–Aug 2023
Online matching under random order arrivals. — **Prof. Pan Xu**
Worked on online bipartite matching problem with bounded degree on the offline vertices, specifically we design algorithms with degree-dependent competitive ratio.

WORKING PROJECTS

Interpreting LLM via attention sparsity, University of Maryland
LLM interpretability — **Prof. John P. Dickerson, Prof. Aravind Srinivasan**
Working on enhancing the interpretability of LLMs via sparse attention techniques. Specifically worked on using correlated sampling approaches to sample sparse attention patterns from attention matrix outperforming the existing sparse attention models like BigBird and LongFormer.

PUBLICATIONS

Simultaneous Group and Individual Fairness in Set Covering Problems
[abc]*Sharmila Duppala*, Nathaniel Grammel, Aravind Srinivasan
Under Submission

Robust Fair Clustering with Noisy Memberships
Sharmila Duppala, Juan Luque, John P. Dickerson, Seyed Esmaeili
AISTATS 2025

Randomized Rounding for Proportional Fair Matching
Sharmila Duppala, Nathaniel Grammel, Juan Luque, Calum MacRury, Aravind Srinivasan
AAAI 2025 (Oral presentation)

Concentration of Submodular Functions Under Negative Dependence
[abc]*Sharmila Duppala*, George Z. Li, Juan Luque, Renata Valieva, Aravind Srinivasan
ITCS 2025

Barter Exchange with Shared Item Valuations
Juan Luque, *Sharmila Duppala*, John P. Dickerson, Aravind Srinivasan
TheWebConference (WWW) 2024

Group Fairness in Set Packing Problems
Sharmila Duppala, Juan Luque, John P. Dickerson, Aravind Srinivasan
IJCAI 2023

Rawlsian Fairness in Online Bipartite Matching:Two-sided, Group, and Individual
Seyed Esmaeili, *Sharmila Duppala*, Vedant Nanda, John P. Dickerson, Aravind Srinivasan
AAAI 2023

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

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

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

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, Steven Skiena
SPAA 2019

KEY COURSES

Graduate Level: Quantum Computing, Discrete Probability, Mechanism Design, Multimodal Foundational Models, Advanced Algorithms, Computational Geometry, Discrete Mathematics, Computer Vision, Deep Learning Theory, Advanced Numerical Optimization, Algorithms in Machine Learning.

POSITIONS OF RESPONSIBILITY

Program Committee Member-Reviewer; Sub-reviewer
The WebConference 2024, 2025, ICLR 2023, SODA 2023, SODA 2019

Organizer, Capital Area Theory Seminar and Algorithmic Fairness Seminar Aug 2021–Present
Responsible for co-organizing CS theory weekly seminar hosting external speakers and a reading group discussing the latest papers in fairness literature.

Graduate Teaching Assistant Jul 2017–Present
Advanced Algorithms (Fall 2023), Analysis of Algorithms (Fall 2018), Computer Systems (Spring 2020) and Discrete Structures (Summer 2020)

Curriculum Designer and Instructor, Girls Talk Math Jun 2021–Aug 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.

TECHNICAL SKILLS

Programming Languages: C, C++, Java, Python, SQL, PL-SQL, MATLAB, Prolog, Qiskit

Libraries for Machine Learning: PyTorch, Numpy, TensorFlow, Jupyter Notebook, Hugging Face.

ACADEMIC AWARDS

Chair's Fellowship, University of Maryland, College Park

TCS (Theoretical Computer Science) Women Scholarship STOC-2018 and STOC 2019
ACM Travel Scholarship SPAA-2019

REFERENCES

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