

Max Springer

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Department of Mathematics
University of Maryland
College Park, MD 20742

Cell: (614) 246 - 1818
Email: mss423@umd.edu
Website: <https://mss423.github.io>

Research Interests Algorithmic Game Theory, Auction and Mechanism Design,
Fair Allocation, Combinatorics, Machine Learning

Education **University of Maryland** College Park, MD
PhD in Applied Mathematics August 2020 – Present
MS in Applied Mathematics Awarded in May 2022
Advisor: Professor MohammadTaghi Hajiaghayi

Cornell University Ithaca, NY
BA in Mathematics, concentration in Biology August 2015 – May 2019
Minors in Biological Sciences & Cognitive Science

Accepted Publications **Improved Oracle Based Algorithms for Adversarial Contextual Bandits**
K. Banhashem, M.T. Hajiaghayi, S. Shin, and M. Springer*
37th Conference on Neural Information Processing Systems - December 2023

Fair and Polylog Approximate Low-Cost Hierarchical Clustering
M. Knittel, M. Springer, J. Dickerson, M.T. Hajiaghayi
37th Conference on Neural Information Processing Systems - December 2023

Generalized Reductions: Making any Hierarchical Clustering Fair and Balanced with Low Cost
M. Knittel, M. Springer, J. Dickerson and M.T. Hajiaghayi
40th International Conference on Machine Learning (ICML) - July 2023

Analysis of a Learning Based Algorithm for Budget Pacing
M.T. Hajiaghayi and M. Springer* ([arXiv](#))
22nd AAMAS Conference - May 2023

Optimal Sparse Recovery Using Decision Stumps
K. Banhashem, M.T. Hajiaghayi and M. Springer*
37th AAAI Conference on Artificial Intelligence - February 2023

Online Algorithms for the Santa Claus Problem
M.T. Hajiaghayi, M.R. Khani, D. Panigrahi and M. Springer*
36th Conference on Neural Information Processing Systems - December 2022

* authors appear in alphabetical order

A Machine Learning Approach for Predicting Impaired Consciousness in Absence Epilepsy

M. Springer, A. Khalaf, ... and H. Blumenfeld

Annals of Clinical and Translational Neurology (ACTN) - July 2022

The Pulse: Transient fMRI Signal Increases in Subcortical Arousal Systems During Transitions in Attention

R. Li, J.H. Ryu, P. Vincent, M. Springer, ... and H. Blumenfeld

NeuroImage - May 2021

Submitted Papers

Price of Class Fairness in Online Matching

S.C. Jahan, M.T. Hajiaghayi, M. Sharify, S. Shin and M. Springer*

ACM Symposium on Discrete Algorithms (SODA) 2024

Dynamic Metric Embedding into ℓ_p Space

K. Banihashem, M.T. Hajiaghayi, D. Kowalski, J. Olkowski and M. Springer*

ACM Symposium on Discrete Algorithms (SODA) 2024

Almost Envy-Free Allocations of Indivisible Goods or Chores with Entitlements

M.T. Hajiaghayi, M. Springer and H. Yami*

37th Conference on Neural Information Processing Systems

Almost Tight Guarantees for Online Nash Social Welfare Maximization

K. Banihashem, M.T. Hajiaghayi, E. Moreno, S. Shin and M. Springer*

37th Conference on Neural Information Processing Systems

A Nash Equilibrium Approach to Missing Data Imputation

K. Banihashem, M.T. Hajiaghayi and M Springer

37th Conference on Neural Information Processing Systems

Estimating Insulin Sensitivity and Beta-Cell Function from the Oral Glucose Tolerance Test: Validation of a new Insulin Sensitivity and Secretion (ISS) Model

J. Ha, S. Chung, M. Springer, ..., A. Sherman

American Journal of Physiology

Presentations

EEG and Machine Learning in Prediction of Impaired Responses to Visual Stimuli During Interictal Epileptiform Discharges

75th American Epilepsy Society Meeting - December 2021

Analysis of a Learning Based Algorithm for Budget Pacing

Facebook Operations Research Workshop - October 2021

A Machine Learning Approach for Classification of Spike-Wave Discharges in Absence Epilepsy

74th American Epilepsy Society Meeting - December 2020

Driving Safety in Patients with Generalized SWD but no Clinical Seizures: Evaluation with a Realistic Driving Simulator

73rd American Epilepsy Society Meeting - December 2019

Honors and Awards	AAAS Mass Media Fellowship Semi-Finalist	2023
	Nokia Bell Lab's Outstanding Innovation Award	Summer 2022
	Recipient of Aziz / Osborn Gold Medal in Teaching Excellence	2021 - 2022
	Recipient of NSF Graduate Research Fellowship (NSF GRFP)	March 2022
	Recipient of University of Maryland Dean's Fellowship	August 2020
Research Experience	Hajiaghayi Research Group	December 2020 – Present
	University of Maryland (College Park), Department of Computer Science	
	Advisor: Professor MohammadTaghi Hajiaghayi	
	Research focuses on fair division problems and approximate algorithms.	
	AI Research Lab	May 2022 – August 2022
	Nokia Bell Labs	
	Advisor: Dr. Matthew Andrews	
	Research focuses on computer vision for automation of industrial monitoring.	
	Laboratory of Biological Modeling	May 2021 – August 2021
	National Institutes of Diabetes and Digestive Kidney Diseases (NIDDK)	
	Advisor: Dr. Arthur Sherman	
	Research focuses on analysis of dynamical systems model of Type 2 Diabetes.	
	Blumenfeld Lab	May 2019 – August 2020
	Yale University School of Medicine, Department of Neurology	
	Advisor: Dr. Hal Blumenfeld	
	Formulated machine learning classification algorithm for epileptiform discharges from large-scale set of scalp EEG data.	
	Integrative Cancer Dynamics Unit	May 2018 – May 2019
	National Cancer Institute, National Institutes of Health	
	Advisor: Dr. Orit Lavi	
	Worked on dynamical systems model of cell cycle and tumorigenesis.	

Computational Physiology Laboratory January 2017 – January 2018
Cornell University, Department of Neurobiology and Behavior
Advisor: Professor Christiane Linster
Investigated the physiological effects and behavioral role of serotonin within the rodent olfactory bulb.

Teaching experience **Lecturer and Head Teaching Assistant (UMD)** Fall 2022
DATA/MSML 602: Principles of Data Science
Presented lectures on various topics concerning Python implementation of data science principles. Devised course assignments and exams.

Graduate Teaching Assistant (UMD) Fall 2021
MATH 140: Calculus I
Held twice weekly recitations for topics covered in lecture. Course topics: Limits, continuity, derivatives and applications of the derivative, integration, etc...

Graduate Teaching Assistant (UMD) Spring 2021
MATH 141: Calculus II
Held twice weekly recitations for topics covered in lecture. Course topics: techniques of integration, differential functions, sequences & series, etc...

Graduate Teaching Assistant (UMD) Fall 2020
MATH 135: Mathematics for Life Sciences
Held twice weekly recitations for topics covered in lecture. Course topics: descriptive statistics, probability, discrete time modeling.

Services **External Reviewer**
Conferences: ESA '21, ITCS '22, AAAI '22, AISTATS '22, ICML '22, NeurIPS '22, ICML '23, NeurIPS '23

Skills **Programming**
Proficient in: MATLAB, Python, Java, R.

Languages: English (native), German (advanced), Italian (limited)