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

Optimal Sparse Recovery Using Decision Stumps
Kiarash Banihashem, MohammadTaghi Hajiaghayi and Max Springer*
37^{th} *AAAI Conference on Artificial Intelligence - February 2023*

Online Algorithms for the Santa Claus Problem
MohammadTaghi Hajiaghayi, MohammadReza Khani, Debmalya Panigrahi and Max Springer*
36^{th} *Conference on Neural Information Processing Systems - December 2022*

A Machine Learning Approach for Predicting Impaired Consciousness in Absence Epilepsy
Max Springer, Aya Khalaf, ... and Hal Blumenfeld
Annals of Clinical and Translational Neurology - July 2022

The Pulse: Transient fMRI Signal Increases in Subcortical Arousal Systems During Transitions in Attention
Rong Li, Jun Hwan Ryu, Peter Vincent, Max Springer, ... and Hal Blumenfeld
NeuroImage - May 2021

Submitted Papers

(Available upon request)

Analysis of a Learning Based Algorithm for Budget Pacing
MohammadTaghi Hajiaghayi and Max Springer* (arXiv)
22^{nd} *International Conference on Autonomous Agents and Multiagent Systems*

Almost Envy-Free Allocations of Indivisible Goods and Chores with Entitlements
MohammadTaghi Hajiaghayi, Max Springer and Hadi Yami*
22nd International Conference on Autonomous Agents and Multiagent Systems

In Preparation

A Nash Equilibrium Approach to Missing Data Imputation
Kiarash Banihashem, MohammadTaghi Hajiaghayi and Max Springer *

Validation of a New Model for Estimating Insulin Sensitivity and Beta-Cell Function from Oral Glucose Tolerance Tests
Stephanie Cheung, Max Springer, Joon Ha and Arthur Sherman

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

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

AI Research Lab Intern — May 2022 – Present
Nokia Bell Labs
Advisor: Dr. Matthew Andrews
Research focuses on computer vision for automation of industrial monitoring.

Laboratory of Biological Modeling — May 2021 – Present
National Institutes of Diabetes and Digestive Kidney Diseases (NIDDK)
Advisor: Dr. Arthur Sherman

* authors appear in alphabetical order

Research focuses on analysis of dynamical systems model of Type 2 Diabetes.

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.

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.

Strogatz Research Group January 2019 – May 2019
Cornell University, Department of Mathematics
Advisor: Professor Steven Strogatz
Research focused on evolutionary game theory and dynamic modeling of bacterial resistance.

Integrative Cancer Dynamics Unit May 2018 – December 2018
National Cancer Institute, National Institutes of Health
Advisor: Dr. Orit Lavi
Worked on dynamical systems model of cell cycle and tumorgenesis.

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

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...
Average student rating: 5/5.

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...
Average student rating: 4.5/5.

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.
Average student rating: 5/5.

Services

External Reviewer
Conferences: ESA '21, ITCS '22, AAAI '22, AISTATS '22, ICML '22, NIPS '22

Skills

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

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