Kimia Hassibi

sites.mit.edu/hassibi — hassibi@mit.edu — (626) 818-4671 — github.com/khassibi

EDUCATION

Massachusetts Institute of Technology (MIT) **Sep. 2024 – Present**
Ph.D. in Electrical Engineering and Computer Science GPA: 5.0/5.0

Laboratory for Information and Decision Systems (LIDS)
California Institute of Technology (Caltech) **Sep. 2020 – Jun. 2024**
B.S. in Computer Science GPA: 4.0/4.3

PRESENTATIONS & PUBLICATIONS

Publications

Zelin Zhao, Zongyi Li, Kimia Hassibi, Kamyar Azizzadenesheli, Junchi Yan, H. Jane Bae, Di Zhou, Anima Anandkumar, "Physics-informed Neural-operator Predictive Control for Drag Reduction in Turbulent Flows," Oct. 03, 2025, PREPRINT, doi: 10.48550/arXiv.2510.03360.

N. Arora, S. Hashash and K. Hassibi, "Enabling Computational Democratization: A Proof-of-Stake Bounty System for User-Proposed Problems and Solutions," 2023 IEEE MIT Undergraduate Research Technology Conference (URTC), Cambridge, MA, USA, 2023, pp. 1-4, doi: 10.1109/URTC60662.2023.10535013. *(authors contributed equally, in abc order)*

Talks

N. Arora, S. Hashash and K. Hassibi, "Enabling Computational Democratization: A Proof-of-Stake Bounty System for User-Proposed Problems and Solutions," 2023 IEEE MIT Undergraduate Research Technology Conference (URTC), Cambridge, MA, USA, 2023.

K. Hassibi, D. Adams, M. Wong, & Y. Yung, "Constraining HCN production via HCN_2 at Titan for applications to prebiotic chemistry". 53rd AAS Division for Planetary Sciences Meeting, 2021.

AWARDS

IEEE 2023 MIT Undergraduate Research Technology Conference Best Paper (1st Place) **2023**

RESEARCH FELLOWSHIPS

Siebel Scholar, Class of 2026 **2025**
Cadence Design Systems Fellowship **2024**
George W. Housner Student Discovery Fund **2023**
Lynn A. Booth and Kent Kresa SURF Fellowship **2023**
Karen and James Cutts SURF Fellowship **2021**

RESEARCH EXPERIENCE

Machine Learning for Optimization Research at MIT LIDS **Sep. 2024 – Present**
Research Assistant, Advisors: Prof. Asuman Özdağlar and Prof. Pablo Parrilo

- Investigating how to adapt pre-trained diffusion models can be repurposed to optimize functions over their learned data distributions.
- Analyzing the emergent algorithms that arise when graph neural networks are trained to solve targeted classes of linear programs.
- Implementing a codebase using PyTorch to run experiments on the two objectives above.

Game Theory Research at Caltech **Jul. 2023 – Jun. 2024**
Undergraduate Research Assistant, Advisor: Prof. Omer Tamuz

- Studied quantal response dynamics, which are a solution concept in which players myopically best respond with some probability of error. This can serve to better understand human behavior, since people are fallible.
- Computationally and mathematically analyzed the stationary distribution of Markov chains with transition matrices defined by the quantal response dynamics of players in a game.
- In Python, simulated different games and used this empirical data to inform or debunk conjectures about whether or not the quantal response equilibria of these games were product measures.
- Proved that in a graphical normal-form game with a bipartite utility structure, in which the players all simultaneously quantal respond, the quantal response equilibrium is a product measure.

Computer Science + Testing Research at Caltech **Jun. 2023 – Jun. 2024**
Undergraduate Researcher doing Senior Thesis, Advisor: Prof. Richard Murray

- Formalized the specifications of an autonomous system in its environment as a GR(1) winning condition, which is a set of linear temporal logic (LTL) formulas that require the autonomous system to satisfy its initial, invariant, and progress conditions if the environment satisfies its initial, invariant, and progress conditions.
- Wrote algorithm to convert these LTL formulas into a graph of a game between the environment and autonomous system. Achieved this by altering source code in the Python library TuLiP.
- Created algorithms to calculate robustness metrics over these game graphs. Then, used these metrics to iteratively find the environment action that is the hardest for the system to successfully respond to.

Machine Learning for Partial Differential Equations Research at Caltech **Jun. – Sep. 2022**
Participant of Undergraduate Research Program (SURF), Advisor: Prof. Anima Anandkumar

- Programmed the Fourier Neural Operator (FNO) ML model to learn solutions to the Navier-Stokes partial differential equations.
- Specifically, trained the FNO model to use the simulated air pressure measurements on an airborne plane's wing to predict the wall-normal velocity of that air. These velocity estimates can aid in real-time opposition flow control to reduce planes' skin-friction drag.
- Deployed the Weights & Biases AI developer tool to hyperparameter-tune this FNO model.
- Resulted in a pre-print.

Computer Science + Atmospheric Chemistry Research at Caltech **Jun. – Sep. 2021**
Participant of Undergraduate Research Program (SURF), Advisor: Prof. Yuk L. Yung

- Using Python, Fortran, and shell scripts, extended a model of Titan's atmosphere to include HCN_2.
- By analyzing the changes in compounds' mixing ratios and correlating these changes to existing chemical equations, found chemical pathways in Titan's atmosphere that create nitrogenous compounds that are precursors to life.
- Presented results at the 53rd AAS Division for Planetary Sciences Meeting

PROJECTS

Proof-of-Stake Bounty System for User-Proposed Problems and Solutions **Apr. – Jun. 2023**
In Networks Class, Advisor: Prof. Adam Wierman

- Resulted in a paper submitted to 2023 IEEE MIT Undergraduate Research Conference.
- Created a novel proof-of-stake cryptocurrency architecture in which users can propose problems and solve pre-existing ones for a bounty. In this cryptocurrency, all the work done by agents is useful and socially beneficial.
- Determined safety guarantees for this architecture. This cryptocurrency can be at least as safe as state-of-the-art proof-of-stake cryptocurrencies.

Variational Autoencoder for Music Generation **Apr. – Jun. 2022**
In Advanced Topics in Machine Learning Class, Advisor: Prof. Yisong Yue

- Using PyTorch, implemented several models (WGAN-GP, InfoGAN, MIDI-VAE) to generate music in the style of Bach.

TEACHING EXPERIENCE

Teaching Assistant - Undergraduate Algorithms Course at Caltech **Apr. – Jun. 2023**
Head Teaching Assistant - Undergraduate Decidability & Tractability Course at Caltech **Jan. – Mar. 2023**

TECHNICAL SKILLS

Languages: C, Java, Python, MATLAB, Mathematica, R, JavaScript, HTML, CSS, Fortran, Shell Scripts, Assembly
Packages/Frameworks: Git, Pandas, NumPy, LaTex, TuLiP, CVXPY, NetworkX, SKLearn, PyTorch, Keras, Matplotlib
Developer Tools: VS Code, PyCharm, IntelliJ IDEA, Eclipse, AWS, Anaconda, Weights & Biases