

# Motahareh Sohrabi

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## Education

- 2021–present **M.S. in Computer Science**, *Université de Montréal/Mila*, Canada.  
2016–2021 **B.S. in Computer Engineering**, *Sharif University of Technology*, Iran.

## Research Interests

- Deep Learning Theory
- Optimization
- Game Theory
- Causal Inference

## Professional Experiences

### Research

- 2021-10–present **Researcher at Mila – Quebec Artificial Intelligence Institute.**
- Study of the Adaptive Step-size Optimization Algorithms for Min-Max Games
  - Constrained Optimization and Sparsity of Neural Network
- Supervisor: Simon Lacoste-Julien
- 2021–Summer **Intern at Shomara, a Data Analysis and Visualization Company.**
- Analysis of Customer Lifetime Value with Databricks solutions.
  - Brief introduction on working with Spark, H2O, MLflow.
- 2019-10–2021-06 **Researcher at Robustness and Interpretability of Deep Learning Lab.**
- **Bachelor Thesis:** Interpretation of Vision Transformers with Random Walk on Attention Graph. (Code). Supervisor: Prof. Mohammad Hossein Rohban.
  - Implementation and analysis of an interpretation method using Shapley value. (Code.)
  - Thorough literature review on adversarial ML and robustness of neural networks.

### Academic

- 2023-03–present **Organizer of Mathematics Study Group.**
- Weekly study and problem-solving sessions. Topic List: analysis, algebra, topology, etc.
- 2022-07 **Attendee of CIFAR Deep Learning Reinforcement Learning Summer School.**
- 2018-08 **Attendee of the Big Data Economics Summer School, Khatam University.**
- 2018-02–2018-06 **Organizer of Complex Systems and Network journal club.**
- Weekly discussions around the course "Introduction to Complexity" (offered by Santa Fe Institute) and the book "Social and Economic Networks"- by Matthew O. Jacson

### Teaching Assistant

- Winter 2023 **Theoretical Principles for Deep Learning (Graduate)**, Prof. Ioannis Mitliagkas.
- Fall 2020 **Game Theory**, Prof. MohammadAmin Fazli.
- Fall 2019 **Social and Economic Networks (Graduate)**, Prof. MohammadAmin Fazli.
- Spring 2019 **Artificial Intelligence**, Prof. Mohammad Hossein Rohban.
- Fall 2018 **Data Structure and Algorithm**, Dr. Sharareh Alipour.

## Selected Course Projects

- Winter 2022 **Study of the Effect of Interaction of Players on the Convergence of Games**, Theory of Deep Learning.
- Fall 2021 **Predictive Uncertainty Estimation with Bayesian Neural Networks**, Probabilistic Graphical Modeling.
- Spring 2020 **P1: Retrieval System Implementation, Wikipedia Dataset | P2: Classification and Clustering of Ag News Dataset | P3: Crawling Researchgate and Implementation of Elastic Search**, Modern Information Retrieval Project, Python.
- Spring 2020 **Implementation of Some Second-order and Variance Reduction Methods in Optimization**, Convex Optimization Project, Pytorch.
- Spring 2018 **Microarray Data Analysis of Leukemia Cancer**, Intro to Bioinformatics, R.
- Fall 2018 **Implementation of Job Finding Website**, System Analysis and Design, Django.
- Spring 2017 **Messenger Database Design**, Database Design Project, Postgresql.
- Spring 2017 **Life Simulation Game**, Advanced Programming Project, Java.

## Selected Graduate-level Courses

- Convex Optimization
- Probabilistic Graphical Modeling
- Theory of Deep Learning
- Adversarial Machine Learning

## Awards and Honors

- 2022 **Recipient of the scholarship under the Ministry of Higher Education's program**, from the University of Montreal.
- 2020 **Recipient of a full fund for a one-semester exchange program**, from Sharif University of Technology at Saint Petersburg University, Russia (Canceled by COVID19).
- 2016–2020 **Recipient of a yearly grant**, a grant for undergraduate studies from the Iranian National Elites Foundation for outstanding academic success.
- 2016 **Ranked 137th in Iran's university entrance exam**, among more than 160,000 applicants and getting admission to the country's top technical university.
- 2012–2016 **Member of NODET**, national organization for development of exceptional talents.

## Volunteer Activities

- 2018–2021 **Member of the Office of Cultural Studies and Humanities.**
- 2019-01 **Member of the organizer team of the Winter Seminar Series 2019.**
- 2017–2019 **Head of the Dormitory Student Association.**
- 2018-08 **Teacher and content designer of complex systems and network science workshop**, at a computer science summer school for 13 to 15-year-old teenagers.

## Skills

- Programming C, Java, Python, R
- Tools HTML, CSS, MYSQL
- Git, PyTorch, VS Code