Mohammad Yaghini

PhD Student in ML, Data Scientist

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Education

Sept.2020 – Present **Ph.D. in Machine Learning**, *University of Toronto and Vector Institute*, Canada, CleverHans Lab (under the supervision of Prof. Nicolas Papernot)

Sept.2017 – Oct.2019 **Master's in Data Science**, *School of Computer and Communication Sciences*, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, GPA: 5.26/6
Thesis: A Human-in-the-loop Framework to Construct Context-dependent Mathematical Formulations of Fairness

Sept.2016 – Aug.2017 **Master's in Communication Systems**, *School of Computer and Communication Sciences*, École Polytechnique Fédérale de Lausanne, Switzerland – switched to Data Science in the 2nd year.

2011–2016 **B.Sc. in Electrical Engineering – Communications**, *Isfahan University of Technology (IUT)*, Iran, GPA: 18.37/20, GPA (junior and senior): 18.66/20
Thesis: An Energy-Efficient Cooperative Mechanism for Device-to-Device Communications

Publications

* Joint 1st author

Hengrui Jia*, **M. Yaghini***, Christopher A. Choquette-Choo, Natalie Dullerud, Anvith Thudi, Varun Chandrasekaran, and Nicolas Papernot. Proof-of-learning: Definitions and practice. *To appear in the 42nd IEEE Symposium on Security and Privacy (Oakland)*, 2021.

Pratyush Maini, **M. Yaghini**, and Nicolas Papernot. Dataset inference: Ownership resolution in machine learning. In *Proceedings of the 2021 International Conference on Learning Representations (ICLR 2021)*, 2021.

M. Yaghini, Hoda Heidari, and Andreas Krause. A Human-in-the-loop Framework to Construct Context-dependent Mathematical Formulations of Fairness. *arXiv e-prints*, page arXiv:1911.03020, Nov 2019.

M. Yaghini, K. Bogdan, and C. Troncoso. Disparate Vulnerability: on the Unfairness of Privacy Attacks Against Machine Learning. *arXiv e-prints*, page arXiv:1906.00389, Jun 2019.

Naman Goel, **M. Yaghini**, and Boi Faltings. Non-Discriminatory Machine Learning Through Convex Fairness Criteria. In *Proceedings of the Thirty-Second AAAI Conference on Artificial Intelligence, (AAAI-18)*, pages 3029–3036, 2018.

Experience

Research Assistant

Sep.2020– Present **CleverHans Lab**, UoT/Vector Institute
- Trustworthy Machine Learning
- Intellectual Property of ML Models
- ML Security for Audio Domain

March.2020– Present **Privacy and Trust Group**, *Reza Shokri*, NUS (remote)
- Human-in-the-loop Explainable ML

Mar.2019– August.2019 **Learning and Adaptive Systems (LAS)**, *Andreas Krause*, ETH Zurich
- Master thesis on context-dependent mathematical formulations of fairness

Oct.2017– Dec.2019 **Security and Privacy Engineering Laboratory (SPRING)**, *Carmela Troncoso*, EPFL
- Quantifying privacy vulnerability and its disparity for ML models, defenses, and the trade-offs

Feb.2018– Jun.2018 **Data Science Lab (DLAB)**, *Robert West*, EPFL
- Designing mechanisms for truthful judgment aggregation to detect misinformation

Feb.2017– Aug.2017 **Artificial Intelligence Laboratory (LIA)**, *Boi Faltings*, EPFL
- Building a convex fairness metric for classifiers

Sep.2014– Aug.2016 **Game Theory & Mechanism Design Research Grp. (GTMD)**, *MohammadHossein Manshaei*
- Designing a game-theoretic mechanism to incentivize device-to-device communication for 5G networks

Industry Experience

Sept.2018– Feb.2019 **Expedia**, *Junior Data Scientist*, Geneva

- Building statistical models for advanced time-series forecasting using Spark

Voluntary Work

July.2017– June.2018 **EPFL Iranian Student Association (IRSA)**, *Public Relations*, Lausanne

- Moderating bi-weekly intellectual discussions on society, culture, technology, psychology, etc.

Notable Student Projects

Jul. 2018	**Defending Against Membership Attacks on ML Models**	*ML Security, Deep Learning*
May 2018	**Symmetric Autoencoder for Text Classification**	*Deep Learning, NLP*
Jun. 2018	**Empirical Mechanism Design for Crowd-Sourced Fact-Checking**	*NLP, Mechanism Design*
Dec. 2017	**Evolution of Swiss Broadcasts in the Course of 20th Century**	*Data Analysis/Visualization*
June 2017	**Fair Machine Learning**	*Machine Learning in society*
May 2017	**EPFL Electricity Consumption Forecasting Challenge (1st Place)**	*Time Series Forecasting*
Jul. 2015	**Optimizing Popular Content Distribution in Cellular D2D Networks**	*Mechanism Design*

Related Course Work

- Machine Learning
- Game Theory and Multi-agent Systems
- Algorithms for Private Data Analysis
- Convex Optimization
- Differential Privacy
- Information Theory & Signal Processing
- Deep Learning
- Data Visualization

Computer Skills

Machine Lear.	Scikit, Pandas, Spark MLib, XGBoost	Languages	Python, Scala, Julia, MATLAB, Java, Javascript/Typescript, C
Deep Lear.	PyTorch, Keras	Big Data	Spark, Hive SQL, Kafka/SparkStreaming
Data Vis.	Plotly, D3.js, Matplotlib	Optimization	CVX, CVXOPT
Web Dev.	JS/TS, HTML, CSS, React	NLP	NLTK, Gensim

Languages and Test Scores

Persian Native proficiency

French Full proficiency (DELF B2: 76.5/100)

Turkish Speaking proficiency

English Full proficiency

TOEFL iBT Total: 109/120, Reading: 29/30, Writing: 27/30, Listening: 29/30, Speak.: 24/30

Awards and Honors

2019-2020 Received **Ph.D.** offers from UoT/Vector Institute (Toronto, CA), EPFL (Lausanne, CH), MPI-SWS (Saarbrücken, DE), UCL (London, UK), and NUS (Singapore, SG)

2016 Received **Direct-Ph.D.** offers from University of Michigan (Ann Arbor, US), University of Pennsylvania, and Virginia Tech (Blacksburg, US)

2016 Received **Master's** offers from EPFL (Lausanne, CH), ETHZ (Zurich, CH), University of British Columbia (Vancouver, Canada)

2011–2016 Received **Gifted Student Award** (Sept. 2011) and **Merit-based admission** to MSc program in Communication Systems (Dec. 2014), Isfahan University of Technology

Jun. 2015 **Ranked 7th** (in the top 8%) among 92 ECE undergraduates and **3rd** among 27 communications engineering students, class of 2011

2011 Ranked in the **top 0.3% (99.6 percentile)** among 252,000 participants in the Nationwide University Entrance Exam, also known as *Concours* (Math-Physics)

References

- **Nicolas Papernot**, Assistant Professor, University of Toronto *nicolas.papernot@utoronto.ca*
- **Carmela Troncoso**, Assistant Professor, SPRING, EPFL *carmela.troncoso@epfl.ch*