Navid Ardeshir

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RESEARCH INTERESTS

Statistical Machine Learning: Towards understanding the generalization properties of overparameterized models using tools in high dimensional statistics, probability, and optimization.

Probability: Applications of optimal transport theory in non-convex optimization and machine learning. In particular, mean field description of wide neural networks.

EDUCATION

Columbia University, NY

Ph.D. in Statistics (2019-2024)
- Current GPA: **4.08/4.33**
- Advisors: Prof. Daniel J. Hsu and Prof. Arian Maleki

Sharif University Of Technology, Iran

B.S. in Electrical Engineering, Communication (2014-2019)
Sharif University of Technology
- Cumulative GPA: **19.21/20** (4/4 US scaling system)
- Advisors: Dr. Kasra Alishahi and Dr. Amin Aminzadeh Gohari
- Deans List (Summa Cum Laude GPA)

RESEARCH EXPERIENCE

2022	C. Sanford[*], N. Ardeshir[*], D. Hsu. "Intrinsic dimensionality and generalization properties of the $\mathcal{R}$-norm inductive bias." Submitted for publication.
2021	N. Ardeshir[*], C. Sanford[*], D. Hsu. "Support vector machines and linear regression coincide with very high-dimensional features." In Advances in Neural Information Processing Systems 35.
2019	N. Ardeshir. "Practical and theoretical developments of algorithms in traffic assignment and estimating origin-destination matrix." BA Thesis.

HONORS AND AWARDS

2019-2024	Columbia Dean's Scholarship.
2014–2018	Valedictorian, EE Department (among 189 students). Sharif University of Technology
2011–2012	Silver Medal In Iran's National Mathematical Olympiad (**INMO**).

TALKS

2022	Intrinsic dimensionality and generalization properties of the $\mathcal{R}$-norm inductive bias NYU Center for Data Science
2021	A geometrical phenomenon: support vector machines and linear regression coincide with very high dimensional features Yale Institute of Network Science (Hosted by Amin Karbasi)
2020	Boosting from a theoretical point of view. Virtual at Sharif University of Technology

COURSE PROJECTS	2021	CLT for empirical transportation cost in general dimensions.
	2020	Online learning through the lens of potential descent.
	2020	A review on deep exploration methods in reinforcement learning.
	2018	Stat oil challenge from Kaggle competition.
	2016	Implementation of sequential power grids restoration using linear programming.
	2014	Implementation of BayesCall algorithm and modeling high-throughput short-read genome sequencing.

RELEVANT COURSES	**Machine Learning:** Advanced ML Theory, Optimization, Reinforcement Learning, Self Supervised Learning, Algorithmic Game Theory. **Probability:** Stochastic Differential Equations, Optimal Transport Theory, High Dimensional Probability, Stochastic Geometry. **Statistics:** Information Theory, High Dimensional Statistics, Bayesian Inference.

TEACHING EXPERIENCE	Fall	2022	**Teaching Assistant**, Advanced Machine Learning. GR5242 Graduate level.
	Spring	2021	**Teaching Assistant**, Applied Statistical Computing. UN2102 Undergraduate/Graduate level.
	Fall	2020	**Teaching Assistant**, Applied Statistical Methods. UN3105 Undergraduate/Graduate level.
	Spring	2019	**Teaching Assistant**, Linear Regression. W4205 Graduate level.

WORKING EXPERIENCE	Summer 2019	**Intern**, Tapsi, Tehran, Iran
		I had the opportunity to work for a major transportation company in order to improve their pricing policies by enhancing their demand estimation algorithm. I implemented several bayesian learning algorithms and created a cohesive benchmark.
	Spring 2018	**Instructor**, Geometry and probabilistic methods for INMO. Iran's National Elite Foundation.

SUMMER SCHOOLS	2022	Deep Learning Theory, Princeton
		Lectures and symposiums on advances in DL theory including: graph nerual networks by Soledad Villar, Implicit bias in optimization by Nathan Srebro, robustness by Sebastien Bubeck.
	2021	Deep Learning Theory, Princeton
		Lectures and symposiums on advances in DL theory including: Double Descent phenomenon by Misha Belkin, and Andrea Montanari. Hosted by Boris Hanin.

PROGRAMMING	Python	Experienced and proficient with deep learning packages such as PyTorch, Tensorflow, Theanno, etc. Narrow experience with Spark.
	R	Proficient in web scraping, data wrangling, and visualization with packages such as Tidyverse, Tidymodels, etc.
	Matlab	Experienced with Simulink and Systematic modeling. Hardware integration and real-time control.
	Swift	Narrow experience with Tensorflow for Swift and protocol oriented programming

OTHER
SKILLS

Languages: Farsi and a fluent English speaker.

Hobbies: Photography, Tennis, Playing Tonbak (persian drum)

Elective   In addition to my core skills in mathematics and statistics I have taken
Courses: graduate level courses in Statistical Mechanics, Operational Research,
               and Dynamical Systems.

REFERENCES   **Daniel Hsu**, Associate Professor of Computer Science,
               Columbia University, NY djhsu@cs.columbia.edu

               Arian Maleki, Associate Professor of Statistics Department,
               Columbia University, NY mm4338@columbia.edu

               Kasra Alishahi, Professor of Mathematics Department,
               Sharif University of Technology, Iran, alishahi@sharif.edu

               Amin Aminzadeh Gohari, Professor of Electrical Engineering Department,
               Sharif University of Technology, Iran, aminzadeh@sharif.edu