Samy Jelassi

CONTACT INFORMATION

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Princeton University
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RESEARCH INTERESTS

Deep learning theory, non-convex optimization

EDUCATION

Princeton University, Princeton, New Jersey, USA

Ph.D. Candidate, Operations Research and Financial Engineering (ORFE), September 2017 (expected graduation date: April 2023)

- Advisors: Profs. Yuanzhi Li, Joan Bruna and Boris Hanin

M.A., Operations Research, May 2019

ENS de Cachan, Cachan, France

M.S., Applied Mathematics, May 2017

- Advisor: Prof. Francis Bach

ENS de Lyon, Lyon, France

B.S., Computer Science, May 2015

Lycée Louis-le-Grand, Paris, France

Classes Préparatoires aux Grandes Écoles, September 2011 - June 2014
University-level preparation for the competitive entrance to French Engineering Schools.

ACADEMIC EXPERIENCE

Deepmind, London, UK   **May 2021 - August 2021**
Research intern
Learning representations for reinforcement learning.
Hosts: Bernardo Avila Pires and Remi Munos.

Facebook AI Research, New York, New York, USA   **May 2020 - August 2020**
Research intern
Adapting Dual Averaging to deep learning optimization.
Host: Aaron Defazio.

Institute for Advanced Study, Princeton, New Jersey, USA   **January 2020 - April 2020**
Visiting student
Special Year on Optimization, Statistics, and Theoretical Machine Learning.

Princeton University, Princeton, New Jersey, USA   **September 2018 - January 2021**
Teaching assistant
Duties including office hours, designing and leading weekly exercises and grading.
- ECE 435/535, Machine Learning and Pattern Recognition, Fall 2021.
- ORF 350, Analysis of Big Data, Spring 2021.
- ORF 409, Introduction to Monte Carlo Simulation, Fall 2020.
- ELE 435/535, Machine Learning and Pattern Recognition, Fall 2019.
- ORF 350, Analysis of Big Data, Spring 2019.
- ELE 435/535, Machine Learning and Pattern Recognition, Fall 2018.

MSRI summer school, Seattle, Washington USA   **Summer 2019**
Teaching assistant
Co-designed and co-taught an advanced research course on deep learning theory with Joan Bruna.

INRIA de Paris, Paris, France   **Summer 2019**
Visiting student Hosted by Prof. Francis Bach.

PUBLICATIONS

Jelassi, S., Mensch, A., Gidel, G., and Li, Y. Adam is no better than normalized SGD: Dissecting how adaptive methods improve GANs performance. Submitted to ICLR 2022.

Jelassi, S., and Li, Y. Towards understanding how momentum improves generalization in deep learning. **Oral presentation** at OPPO workshop ICML 2021. Submitted to ICLR 2022.

Defazio, A, and Jelassi, S. Adaptivity without compromise: a momentumized, adaptive, dual averaged gradient method for stochastic optimization. JMLR.

Rahme, J., Jelassi, S., and Weinberg, S. M. Auction learning as a two-player game. ICLR 2021.

Rahme, J., Jelassi, S., Bruna, J., and Weinberg, S. M. A Permutation-Equivariant Neural Network Architecture For Auction Design. AAAI 2021.

Domingo-Enrich, C., Jelassi, S., Mensch, A., Rotskoff, G., and Bruna, J. A mean-field analysis of two-player zero-sum games. NeurIPS 2020.

Sebbouh, O., Gazagnadou, N., Jelassi, S., Bach, F., and Gower, R. M. Towards closing the gap between the theory and practice of SVRG. NeurIPS 2019.

Jelassi*, S., Domingo Enrich*, C., Scieur, D., Mensch, A., and Bruna, J. Extra-gradient with player sampling for provable fast convergence in n-player games. ICML 2020. *Equal contribution*

Rotskoff, G., Jelassi, S., Bruna, J., and Vanden-Eijnden, E. 2019. Global convergence of neuron birth-death dynamics. ICML 2019.

Pumir*, T., Jelassi*, S., and Boumal, N. Smoothed analysis of the low-rank approach for smooth semidefinite programs. NeurIPS 2018.
Equal contribution, **Oral presentation** (top 2.8%, one of 30 among 1100 accepted papers).

HONORS AND
AWARDS

NeurIPS travel award, 2018

Princeton SEAS travel grant, 2018

TALKS

Towards understanding how momentum improves generalization in deep learning. ICML. July 2021.

Smoothed analysis of some machine learning problems. Seminar at Google Brain Montreal, Canada. October 2019.

Global Convergence of the neuron birth-death dynamics. Math and Deep Learning seminar at New York University, USA, February 2019.

Smoothed analysis of the low-rank approach for smooth semidefinite programs. Plenary oral presentation at the NeurIPS conference, Montreal, Canada, December 2018.

Handling non-convexity in low rank approaches for semidefinite programming. MIC seminar at New

York University, USA, November 2018.

SERVICE   Reviewer for NeurIPS 2019, 2020, 2021, MSML 2020, ICML 2020, JMLR.