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Michelangelo Naim

Curriculum Vitae et Studiorum

I am Postdoctoral Researcher with demonstrated experience in applying physics, mathematics, and AI to a wide variety of problems. My passion for AI drives my research in language and memory. Using LLMs, I apply mathematical and computational techniques to improve deep learning performance and optimize memory design and management. Moreover, my expertise applies the latest neuroscience findings to develop cutting-edge AI in order to make systems more efficient and faster to train. I possess strong leadership skills, evidenced by my ability to guide other researchers in projects that start at theoretical development and result in efficient, real-time solutions.

Experience

April 2022 - present **MIT - Massachusetts Institute of Technology**, Cambridge, USA. K. Lisa Yang Integrative Computational Neuroscience (ICoN) Postdoctoral Fellow at the McGovern Institute for Brain Research. Advisors: Guangyu Robert Yang and Ann Graybiel.

Jan 2022 - April 2022 **MIT - Massachusetts Institute of Technology**, Cambridge, USA. Postdoctoral Associate in the Department of Brain and Cognitive Sciences. Advisor: Guangyu Robert Yang.

Education

Oct 2017 - Oct 2021 **Weizmann Institute of Science**, Rehovot, Israel. PhD in Theoretical Neuroscience. Advisor: Misha Tsodyks. Thesis title: "Episodic memory from first principles".

Oct 2015 - Sept 2017 **Sapienza - Università di Roma**, Rome, Italy. Master's degree in Theoretical Physics, 110/110 cum Laude. Thesis advisors: Giorgio Parisi and Alessandro Treves (SISSA). Thesis title: "Analysis of a Potts Neural Network".

Oct 2012 - Sept 2015 **Sapienza - Università di Roma**, Rome, Italy. Bachelor's degree in Physics. 110/110 cum Laude. Thesis advisor: Federico Ricci Tersenghi. Thesis title: "Phase transitions in the Ising Model".

Visiting Institutions

Sept 2019 - Dec 2019 **Institute for Advanced Study**, Princeton, NJ.

Aug 2018 - Sept 2018 **Kavli Institute for Theoretical Physics**, Santa Barbara, CA.

Awards and Honors

Feb 2020 **The 2020 Lee A. Segel Memorial Prize in Theoretical Biology.**

Mar 2018 - Oct 2021 **M-GATE**: Participated in this Marie Sklodowska-Curie Innovative Training Network funded by Horizon2020 as one of 15 early-stage researchers.

Jan 2017 - Jul 2017 **Undergraduate Scholarship at SISSA**: Awarded for a Master's thesis project in theoretical physics applied to neural networks, supervised by Alessandro Treves at SISSA and Giorgio Parisi in Rome.

Oct 2013 - Jun 2015 **Percorso d'Eccellenza (Honor Classes) - Bachelor's Degree**: Selected for advanced coursework and problem-solving, reserved for the top 10% of students.

Skills

Programming Languages **Python**, **Pytorch**, **C**, **C++**, **Javascript**

Highlighted Publications

[3] Zhao Kaiya, Michelangelo Naim, Jovana Kondic, Manuel Cortes, Jiaxin Ge, Shuying Luo, Guangyu Robert Yang, and Andrew Ahn. "Lyfe Agents: Generative agents for low-cost real-time social interactions". In: *arXiv preprint arXiv:2310.02172* (2023).

[2] Michelangelo Naim, Mikhail Katkov, Sandro Romani, and Misha Tsodyks. "Fundamental law of memory recall". In: *Physical Review Letters* 124.1 (2020), p. 018101.

[1] Michelangelo Naim, Vezha Boboeva, Chol Jun Kang, and Alessandro Treves. "Reducing a cortical network to a Potts model yields storage capacity estimates". In: *Journal of Statistical Mechanics: Theory and Experiment* 2018.4 (2018), p. 043304.