Michelangelo Naim

Curriculum Vitae et Studiorum

Department of Brain and Cognitive Sciences
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I am a service minded and detail-oriented theoretical neuroscience Postdoctoral Associate with strong computational abilities and interest in machine learning – specifically regarding questions of language and vision. I want to model the brain with machine learning tools and develop brain inspired learning principles which could aid to increase the performance of neural networks.

Experience

Jan 2022 - present **MIT - Massachusetts Institute of Technology**, Boston, 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. I attended the program 'Recording, analyzing, manipulating, and modeling whole brain activity'.

Publications

[5] Michelangelo Naim, Mikhail Katkov, and Misha Tsodyks. "Effects of order on memory of event times". In: *Scientific Reports* 11.1 (2021), pp. 1–9.

[4] Michelangelo Naim et al. "Fundamental law of memory recall". In: *Physical Review Letters* 124.1 (2020), p. 018101.

[3] Michelangelo Naim et al. "Emergence of hierarchical organization in memory for random material". In: *Scientific Reports* 9.1 (2019), p. 10448.

[2] Michelangelo Naim et al. "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.

[1] Chol Jun Kang et al. “Life on the Edge: Latching Dynamics in a Potts Neural Network”. In: *Entropy* 19.9 (2017), p. 468.

Awards and honors

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

Oct 2017 - Oct 2021 **M-GATE**: International PhD programme for highly motivated young scientists, offering 15 early-stage researchers (ESRs) the opportunity to improve their research and entrepreneurial skills and enhance their career prospects. This Marie Sklodowska-Curie Innovative Training Network is funded by the European Community’s Framework programme Horizon2020.

Jan 2017 - Jul 2017 **Undergraduate scholarship at SISSA**: scholarship for my Master’s thesis project in which I applied theoretical physics to neural networks with supervisors Alessandro Treves at SISSA and Giorgio Parisi in Rome.

Oct 2013 - Jun 2015 **Percorso d’Eccellenza (Honor classes) - Bachelor’s degree**: It consists of a class formed by the most promising students (about 10% of all students) who are asked to dedicate time in deepening topics through the discussion of problems, the presentation of relevant and methodological examples and to solve exercises. The whole is divided into seven additional courses.

Skills

Languages **English** (fluent), **Hebrew** (competent), **Italian** (native)

Programming **Python** (advanced), **C** (advanced), **PyTorch** (advanced) **LaTeX** (advanced), **Matlab** (competent), **Mathematica** (competent), **C++** (competent), **GML** (beginner)

Community and Extracurricular activities

2012 - present Tutor in Physics, Math, Chemistry and Programming. Support to high school and university students.