Adrian Valente

adrian-valente | adrian-valente.github.io | adrian.valente@ens.fr | +33.6.83.44.53.70

Education

PhD in Computational Neuroscience, École Normale Supérieure (Paris, FR) 2019 - 2022

"Low-rank network models of neural computations", supervised by Srdjan Ostojic (ENS Paris), in collaboration with Jonathan Pillow (Princeton University).

MSc in Computer Science, EPFL (Lausanne, CH) 2017 - 2019

Engineering Diploma, École Polytechnique (Paris, FR) 2014 - 2017

Prep school, Lycée Stanislas (Paris, FR) 2012 - 2014

Work Experience

Data Scientist, ErVaccine Technologies (Lyon, FR) June 2023 - present

Data-driven discovery of neo-epitopes for targeted cancer immunotherapies (especially in retrotransposons); setup and maintenance of an HPC cluster.

Postdoctoral Researcher, École Normale Supérieure (Paris, FR) Nov 2022 - May 2023

- Project on inferring network structure for multi-area brain computations (with João Barbosa).
- Project on equivariant recurrent networks for Lie groups (supervision of a first-year PhD student).
- Project on interpretation of internal computations in language and vision deep models.

Software Engineering Intern, Microsoft (Paris, FR) Aug 2018 - Feb 2019

Worked in the Universal Store team, implemented components of the backend, developed and deployed ranking algorithms for products and sales team (skills: C#, Scope, Azure).

Research Intern, Concordia University (Montréal, CA) Mar - Jul 2017

Prepared my engineering diploma thesis on a numerical optimization algorithm to compute properties of dynamical systems, with applications to computational biology (astrocytic glutamate reuptake notably).

Skills

Computer Languages	Python, R, shell, C, C++, Java, C#, Matlab.
Computer Tools	Unix, git, HPC (Slurm, Spark).
Data Analysis	Python stack (pandas, sklearn, seaborn et al.), pytorch.
Biological data analysis	Electrophysiological data (NWB), bulk & scRNAseq (scanpy & Seurat).
Human Languages	French (native), Spanish (native), English (fluent).
Computer Theory	Deep Learning, Machine Learning, Statistical modelling, Numerical Optimization, Cryptology, TCP/IP Networks, Computer Vision, Computer Graphics.

Publications

Published papers

- Valente A., Pillow J., Ostojic S., "Extracting computational mechanisms from neural data using low-rank RNNs", *Neural Information Processing Systems 2022* link.
- Dubreuil A.*, Valente A.*, Beiran M., Mastrogiuseppe F., Ostojic S., "The role of population structure in computations through neural dynamics", *Nature Neuroscience*, 25, p. 783-794, link.
- Valente A., Ostojic S., Pillow J., "Probing the Relationship Between Latent Linear Dynamical Systems and Low-Rank Recurrent Neural Network Models", *Neural Computation*, 34(9), p. 1871-1892, link.
- Beiran M., Dubreuil A., Valente A., Mastrogiuseppe F., Ostojic S., "Shaping dynamics with multiple populations in low-rank recurrent networks", *Neural Computation*, 33(6), p. 1572-1615, link.

Preprints

- Pagan M.*, Valente A.*, Ostojic S., Brody C., "Brief technical note on linearizing recurrent neural networks (RNNs) before vs after the pointwise nonlinearity", *arXiv*, 2309.04030, 2023, link.

Conference abstracts

- *Bernstein 2023*, Di Bernardo A., Valente A., Mastrogiuseppe F., Ostojic S., "Shaping manifolds in equivariant recurrent neural networks".
- *Bernstein 2022*, Valente A., Pillow J., Ostojic S., "Inferring low-rank network models from neural activity".
- *FENS 2022*, Di Bernardo A., Mastrogiuseppe F., Valente A., Ostojic S. "Shaping activity manifolds in low-rank recurrent neural networks".
- *FENS 2022*, Valente A., Pillow J., Ostojic S., "Extracting computational mechanisms from neural activity with low-rank networks".
- *Cosyne 2020*, Dubreuil A.*, Valente A.*, Mastrogiuseppe F., Ostojic S., "Disentangling the roles of dimensionality and cell populations in neural computations".
- *NeurIPS 2019 workshop*, Dubreuil A.*, Valente A.*, Mastrogiuseppe F., Ostojic S., "Disentangling the roles of dimensionality and cell populations in neural computations" (Real Neurons and Hidden Units workshop).
- *NCCD 2019*, Valente A., Dubreuil A., Ostojic S., "Processing information stored in working memory through modulations of effective connectivity".

Talks

- *CNS 2023*, Workshop "Low-dimensional manifolds of neural dynamics and their role in brain function" (Leipzig, GE)
- *Cosyne 2023*, Workshop "Are neurons interpretable? Disentangled representations and modularity in biological and artificial brains" (Mont-Tremblant, CA).
- *Apple*, Invited seminar (Barcelona, SP), 2023.
- *SNUFA seminar series*, "Extracting computational mechanisms from neural data with low-rank RNNs", online, 2023.
- *Université de Genève*, Invited seminar, 2023.
- *MetaConscious lab, MIT*, Invited seminar, 2022.

Grants and awards

2019 ED3C doctoral program funding grant (top half submissions)

2019 Prix de la Société Suisse d'Informatique (prize for second best GPA in EPFL CS department).

Teaching

PSL University, Paris	Interpretability and explainability in ANNs (Master), 2023
SciencesPo, Paris	Applied statistics for social sciences (first year), 2022, 2023.
ENS, Paris	RNNs in Neuroscience (Master's seminar), 2022, 2023.
ESPCI, Paris	AI in Neuroscience (Biomedical Engineering Master), 2020, 2022.
ENS, Paris	Data Science & Machine Learning: Do it yourself! (Master), 2020-2022.
ENS, Paris	Python programming for cognitive science (Master), 2019.