

Alberto Silvio CHIAPPA

Engineer | PhD Student in Computational Neuroscience and AI

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Passionate about AI and research, I started a career in industry after completing my MSc in Computational Science and Engineering. I spent over three years at Schindler's R&D, in two of which I led the Schindler EPFL Lab. Since 2021 I have been pursuing a PhD in Computational Neuroscience and Artificial Intelligence at EPFL, supervised by Prof. Alexander Mathis. My main research interests are reinforcement learning and adaptation, with a focus on complex and high-dimensional control systems. My research highlights include first author publications at NeurIPS (2022, 2023) and Neuron (2024), and victories in multiple NeurIPS machine learning competitions (MyoChallenge 2022 and 2023, Auto-bidding Challenge 2024).

EDUCATION

Present January 2021	PhD student Computational Neuroscience and AI, A. Mathis Group, LAUSANNE, EPFL, Switzerland <ul style="list-style-type: none">> Curriculum learning for motor skills (Neuron 2024)> Exploration in high-dimensional systems (NeurIPS 2023)> Adaptive Reinforcement Learning (NeurIPS MyoChallenge 2022 and 2023, winner)> Inductive biases for locomotion with a variable body shape (NeurIPS 2022)> Teaching assistant : Software Engineering, Brain-inspired Machine Learning, Numerical Mathematics> Supervision : 20+ semester projects and master theses <div>Reinforcement Learning Computational Neuroscience PyTorch MuJoCo PyBullet MyoSuite</div>
July 2018 September 2015	Double MSc in Computational Science and Engineering EPFL and Polytechnic University of Milan, LAUSANNE, Switzerland and MILAN, Italy <ul style="list-style-type: none">> Comprehensive foundation in theoretical mathematics, including Functional Analysis and Partial Differential Equations> Specialized in Computational Science, with courses on Machine Learning, Software Engineering, Parallel Computing, Image Processing, and Signal Processing> Final results : 5.65/6 GPA (EPFL), 110/110 cum laude (PoliMi) <div>Machine Learning Software engineering Partial Differential Equations</div>
September 2015 October 2012	BSc in Mathematical Engineering Polytechnic University of Milan, MILAN, Italy <ul style="list-style-type: none">> Solid Mathematical fundamentals paired with broad-spectrum engineering preparation> Thesis : <i>Soil profile reconstruction from the superficial response to acoustic signals</i>. Final result : 110/110 <div>Analysis Probability Theory Numerical Mathematics Mechanics</div>


PROFESSIONAL EXPERIENCE

December 2024 August 2024	Research Intern Sony Data Science and AI group, Tokyo, Japan <ul style="list-style-type: none">> Auto-bidding agent for real-time auctions> Oral presentation at the NeurIPS 2024 workshop <i>Auto-bidding in large-scale auctions</i> <div>Autonomous Agents Advertisement Business</div>
December 2020 August 2018	Engineer and Team Leader Schindler EPFL Lab, LAUSANNE, Switzerland <ul style="list-style-type: none">> Multi-Agent Reinforcement Learning : traffic optimization of elevator groups> Project management : maintenance robot; stress detection with wearable sensors> Data science : prediction of maintenance contracts termination; estimation of budget overrun> Supervision : 20+ interns and thesis students from EPFL and ETH <div>Project Management Python Machine Learning Computer Vision Agile Development</div>
July 2018 July 2017	Intern and Master's Thesis student Schindler New Technologies, LUZERN, Switzerland <ul style="list-style-type: none">> Crowd-sourced phone sensor data analysis> Real-time context recognition using mobile phone sensor data : forecasting time series with Recurrent Neural Networks to predict elevator entry timing> Oral presentation at the Applied Machine Learning Days 2019, <i>Machine Learning and Transportation</i> <div>TensorFlow Android development scikit-learn Firebase AirFlow Power BI</div>

TECHNICAL SKILLS

Software development	Python, Agile Development (SCRUM), GitHub, Jira, Confluence, Bitbucket
Machine Learning	PyTorch, RLLib, StableBaselines3, scikit-learn, TensorFlow, Pandas
Others	Docker, MuJoCo, Azure, AWS, RunAI, Firebase

PAPERS AND PUBLICATIONS

1.  **Alberto Silvio Chiappa**, Briti Gangopadhyay, Zhao Wang, Shingo Takamatsu. Auto-bidding in real-time auctions via Oracle Imitation Learning (OIL). Preprint, 2024. <https://doi.org/10.48550/arXiv.2412.11434>
2.  **Alberto Silvio Chiappa***, Pablo Tano*, Nisheet Patel*, Alexandre Pouget, and Alexander Mathis. Acquiring musculoskeletal skills with curriculum-based reinforcement learning. *Neuron*, 2024. <https://doi.org/10.1101/2024.01.24.577123>
3.  Alessandro Marin Vargas*, Axel Bisi*, **Alberto Silvio Chiappa**, Christopher Versteeg, Lee E. Miller, Alexander Mathis. Task-driven neural network models predict neural dynamics of proprioception. *Cell*, 2024. <https://doi.org/10.1101/2023.06.15.545147>
4.  **Alberto Silvio Chiappa**, Alessandro Marin Vargas, Ann Zixiang Huang, and Alexander Mathis. Latent exploration for reinforcement learning. *Advances in Neural Information Processing Systems 35 (NeurIPS)*, 2023. <https://doi.org/10.48550/arXiv.2305.20065>
5.  Nisheet Patel*, Pablo Tano*, **Alberto Silvio Chiappa***, Alex Pouget, Alexander Mathis. Musculoskeletal skill learning with curriculum-based Static to Dynamic Stabilization. *Cosyne 2023* (peer-reviewed extended abstract)
6.  Vittorio Caggiano, Guillaume Durandau, Huwawei Wang, **Alberto Silvio Chiappa**, Alexander Mathis, Pablo Tano, Nisheet Patel, Alexandre Pouget, Pierre Schumacher, Georg Martius, Daniel F.B. Haeufle, Yiran Geng, Boshi An, Yifan Zhong, Jiaming Ji, Yuanpei Chen, Hao Dong, Yaodong Yang, Rahul Siripurapu, Luis Eduardo Ferro Diez, Michael Kopp, Vihang Patil, Sepp Hochreiter, Yuval Tassa, Josh Merel, Randy Schultheis, Seungmoon Song, Massimo Sartori, Vikash Kumar. MyoChallenge 2022 : Learning contact-rich manipulation using a musculoskeletal hand. *PMLR*, 2022.
7.  **Alberto Silvio Chiappa**, Alessandro Marin Vargas, Alexander Mathis. DMAP : a Distributed Morphological Attention Policy for learning to locomote with a changing body. *Advances in Neural Information Processing Systems 35 (NeurIPS)*, 2022. <https://doi.org/10.48550/arXiv.2209.14218>
8.  Alessandro Marin Vargas, Axel Bisi, **Alberto Silvio Chiappa**, Chris Versteeg, Lee E Miller, Alexander Mathis. Action recognition best explains neural activity in cuneate nucleus. *Cosyne 2022* (peer-reviewed extended abstract).
9.  Khushdeep Singh Mann, Steffen Schneider, **Alberto Silvio Chiappa**, Jin Hwa Lee, Matthias Bethge, Alexander Mathis, and Mackenzie W. Mathis. Out-of-distribution generalization of internal models is correlated with reward. *Self-Supervision for Reinforcement Learning Workshop-ICLR*, 2021.
10.  **Alberto Silvio Chiappa**, Stefano Micheletti, Riccardo Peli, Simona Perotto. Mesh adaptation-aided image segmentation. *Communications in Nonlinear Science and Numerical Simulation* 74, 2019. <https://doi.org/10.1016/j.cnsns.2019.03.010>

LANGUAGES

English ●●●●● Italian ●●●●● French ●●○○○ German ●○○○○

AWARDS, PRIZES AND OTHER ACTIVITIES

- > Auto-bidding in large-scale auctions - NeurIPS 2024 competition, 1st place (phase I) and 6th place (phase II)
Developed an auto-bidding agent by integrating nonlinear programming and deep learning. Invited speaker at NeurIPS 2024.
- > MyoChallenge NeurIPS competition, 1st place (2022 and 2023)
Member of the winning team in both editions of the challenge. We used Reinforcement Learning to train a musculoskeletal model of a human arm to perform dexterous object manipulation tasks. Oral presentation at the MyoChallenge workshop, NeurIPS 2023.
- > Contributions at international conferences of Artificial Intelligence and Computational Neuroscience
NeurIPS (2022, 2023, 2024, poster and talk), FENS 2024 (poster), Cosyne (2023, poster), Bernstein (2022, poster), AMLD (2019, talk).
- > Reviewer : NeurIPS 2024 and ICLR 2025
- > SSN Travel Fellowship 2024
- > Double master scholarship, Polytechnic University of Milan (2017-2018)
- > Polytechnic University of Milan enrollment fee exemption scholarship (every year, 2012-2018)
- > Applied Mathematics competition, Catholic University of Milan, 3rd place (2012)
- > Lions youth exchange scholarship (2011)
- > High school Mathematics Olympics, 1st place (2009)