London, 2025
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Paulo Rauber

Research interests

Artificial Intelligence, Machine Learning, Reinforcement Learning, Formalized Mathematics.

Background

2020– **Lecturer in Artificial Intelligence**, *Queen Mary University of London (United Kingdom)*.

2017–2020 **Postdoctoral Researcher**, *IDSIA, Swiss AI Lab (Switzerland)*.
Supervisor: Jürgen Schmidhuber.

2012–2017 **PhD in Computer Science**, *Joint degree at University of Campinas (Brazil) and University of Groningen (Netherlands)*.
Supervisors: A.X. Falcão, A.C. Telea, P.J. de Rezende, and J.B.T.M. Roerdink.
Admitted in first place to MSc program and consequently invited to PhD program.

2008–2011 **BSc in Computer Science**, *Federal University of Santa Catarina (Brazil)*.
More than three standard deviations above the mean on national graduate school admission exam.

Selected papers

2025 R. Sasso, M. Conserva, D. Jeurissen, and P. Rauber, *"Exploration with Foundation Models: Capabilities, Limitations, and Hybrid Approaches"*, arXiv preprint.

2025 M. Conserva, R. Sasso, and P. Rauber, *"On the Limits of Tabular Hardness Metrics for Deep RL: A Study with the Pharos Benchmark"*, arXiv preprint.

2025 R. Sasso, M. Conserva, D. Jeurissen, and P. Rauber, *"Foundation Models as World Models: A Foundational Study in Text-Based GridWorlds"*, arXiv preprint.

2023 R. Sasso, M. Conserva, and P. Rauber, *"Posterior Sampling for Deep Reinforcement Learning"*, **International Conference on Machine Learning (ICML)**.

2022 M. Conserva and P. Rauber, *"Hardness in Markov Decision Processes: Theory and Practice"*, **Conference on Neural Information Processing Systems (NeurIPS)**.

2022 A. Ramesh*, P. Rauber*, M. Conserva, and J. Schmidhuber, *"Recurrent Neural-Linear Posterior Sampling for Non-Stationary Contextual Bandits"*, **Neural Computation**.

2019 P. Rauber, A. Ummadisingu, F. Mutz, and J. Schmidhuber, *"Hindsight Policy Gradients"*, **International Conference on Learning Representations (ICLR)**.

Supervision

2020- PhD theses: M. Conserva (2020-2025, with S. Lucas); R. Sasso (2021-, with S. Riis).

2015- MSc theses: 36 supervised.

2015- BSc theses: 32 supervised, 6 under supervision.

Teaching

2024- **Neural Networks and Deep Learning**, *MSc-level*.
Tensors, automatic differentiation, linear regression, softmax regression, multi-layer perceptrons, convolutional neural networks, recurrent neural networks, and transformers.

2020- **Statistical Planning and Reinforcement Learning**, *MSc-level, with D. P. Liebana*.
Markov decision processes, tabular model-based algorithms, exploration and exploitation, tabular model-free algorithms, non-tabular model-free algorithms, and deep reinforcement learning.

2020-2021 **Data Mining**, *MSc-level*.

2017-2019 **Deep Learning lab**, *MSc-level*.

Grant proposals

2019 Developed a proposal accepted by the Swiss National Science Foundation with two collaborators from the Swiss AI Lab (NEUSYM, awarded approximately 700,000 USD).