



Massimiliano Falzari

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Home: Oosterhamrikkade 66-1, 9714BG Groningen (Netherlands)

WORK EXPERIENCE

AI & Data Scientist

Wide group Srl [01/04/2025 – Current]

City: Milan | **Country:** Italy

- Develop end-to-end AI-based solutions

AI Engineer

Bluegreen [01/03/2025 – Current]

City: Trieste | **Country:** Italy

- Architected and developed a Retrieval-Augmented Generation (RAG) system.
- Integrated Langchain and LangGraph for advanced AI workflows.
- Built interactive UIs using Streamlit.
- Deployed scalable AI applications with FastAPI.

Data & AI researcher

Engineering Ingegneria Informatica Spa [01/12/2024 – Current]

City: Rome | **Country:** Italy | **Website:** <https://www.eng.it/> | **Email address:** massimiliano.falzari@eng.it | **Name of unit or department:** Research & Innovation

Main Tasks:

- Research & Innovation projects at both national and international levels
- Implement innovative methodologies and tools to optimize project outcomes
- Design, develop, and finetune prototypes in the context of LLMs
- Focus on MLOps and LLMOps.

Technologies:

- Huggingface, FSDP, TRL, MLflow, SLURM
- Finetuning of LLM (70+ Bilions Parameters) using different low-rank adapters (LoRA, DoRA, X-LoRA)
- RAG, Agents (Langchain, LangGraph), Evaluation (lm-evaluation-harness), Deployment (Torchserve)
- Multi-GPU training using FSDP on CINECA Leonardo HPC
- Focus on LLMOps and production-ready systems

Teaching Assistant

University of Groningen [01/04/2021 – 31/07/2024]

Address: Zernike Campus, Groningen (Netherlands) | **Business or sector:** Education

Multiple times throughout each academic year.

- Grading homework and exams
- Teach seminar group
- Course coordination and organization

The courses that I supervised and performed the aforementioned tasks for were:

- Languages and Machine (Computer Science Bachelor)
- Cognitive Robotics (Artificial Intelligence Master)

- Deep Learning (Artificial Intelligence Master)
- Reinforcement Learning (Artificial Intelligence Bachelor)
- Deep Reinforcement Learning (Artificial Intelligence Master)

Backend Developer and AI Consultant

Basis Health [01/05/2021 – 01/10/2021]

City: Groningen | **Country:** Netherlands

- Backend development (in Clojure)
- Brainstorm ideas on how to treat data
- Propose potential Machine Learning approaches
- Coordinate with frontend developers

PUBLICATIONS

[2025]

Fisher-Guided Selective Forgetting: Mitigating The Primacy Bias in Deep Reinforcement Learning

This paper addresses the "primacy bias" (PB), a critical issue in Deep Reinforcement Learning (DRL) where agents overfit to early experiences, hindering their ability to learn from new information. The authors present a novel method called **Fisher-Guided Selective Forgetting (FGSF)**, which leverages the Fisher Information Matrix (FIM) to understand and counteract PB.

BNAIC 2024, Massimiliano Falzari and Matthia Sabatelli

[2024]

Upside-Down Reinforcement Learning for More Interpretable Optimal Control

This paper explores the use of interpretable machine learning models within the framework of Upside-Down Reinforcement Learning (UDRL). UDRL is a unique approach that frames reinforcement learning as a supervised learning problem, aiming to learn policies that map states and desired rewards to actions. The authors investigate whether tree-based methods, such as Random Forests (RFs) and Extremely Randomized Trees (ETs), can perform as well as neural networks (NNs) in the UDRL setting, while providing the added benefit of improved interpretability.

ICAART 2025, BNAIC 2024. Juan Cardenas-Cartagena, Massimiliano Falzari, Marco Zullo, Matthia Sabatelli

EDUCATION AND TRAINING

Master Degree, Artificial Intelligence and Computational Intelligence

University of Groningen [01/09/2022 – 26/11/2024]

City: Groningen | **Country:** Netherlands | **Website:** <https://www.rug.nl/> | **Final grade:** grade 8.8 with Cum Laude
| **Thesis:** Primacy bias in Deep Reinforcement Learning

Currently finishing my Thesis (grade 8.8 with Cum Laude)

- Deep Learning
- Deep reinforcement learning
- Natural Language Modelling
- Science Communication
- Machine Learning
- Data Science
- Neural Networks
- Robotics

Bachelor's degree, Artificial Intelligence

University of Groningen [01/09/2018 – 01/12/2021]

City: Groningen | **Country:** Netherlands | **Website:** <https://www.rug.nl/> | **Final grade:** 7.5 | **Thesis:** Autoencoder-based Deep Reinforcement Learning for ground-level walking of Human Musculoskeletal models

- Coding (C, C++, Python, Java, Haskell) (OOP, Functional and Imperative)
- Math (Calculus, Multivariable Calculus, Linear Algebra, Probability theory)
- Old Fashion AI (Symbolic AI, Knowledge systems, statistical modeling)
- Neural Networks
- Cognitive Psychology and related studies
- Machine Learning and Reinforcement Learning

High school Diploma

Liceo Scientifico Galileo Galilei [01/09/2012 – 01/07/2017]

City: Trieste | **Country:** Italy

SKILLS

GIT version control, Linux Command / Database: SQL, MongoDB / WandB / Advanced text editors (emacs, vim) / Docker / Databases (MongoDB, Redis, MariaDB)

Python

Python HuggingFace / Reinforcement Learning (openai.gym, stable-baselines3) / Deep Learning frameworks: PyTorch, Tensorflow, Keras / Frameworks & Libraries: OpenCV, Sci-kit learn, NumPy, Pandas, SciPy, Matplotlib. / Robotics Tools: ROS, OpenCV, PyGlet, PyBullet, PyChrono, OpenAI Gym, Docker / Poetry and pre-commit

Programming Languages

Lisp Programming / Functional Programming / Good programming skills (C, Python, Java, C++) / Object-Oriented Programming / Clojure programming language / R statistics, Python / Beginner JavaScript for WebDevelopment / Go / Golang

PROJECTS

[01/09/2023 – 01/10/2024]

Primacy Bias Through the Lens of the Fisher Information Matrix

- Pytorch, Tianshou, Wandb, Gymnasium
- Analysing and explaining the Primacy Bias phenomena using the Fisher Information Matrix
- Implementing forgetting mechanism for Neural Networks
- Connecting Primacy bias to Transfer Learning

[01/04/2021 – 01/07/2021]

Sport statistics website

- MariaDB, Docker, R, R-Shiny
- Show game statistics for all players
- Analyze and display trends and points for potential improvement
- Organize data for faster retrieval

Link: https://github.com/vimmoos/volley_stats

[01/03/2019 – 01/07/2019]

Database and management platform

- MongoDB, Javascript, React
- Restructuring and Migration of Excel sheet to Database
- Implemented a User-based platform for interact with the data

[01/01/2024 – 01/04/2024]

Investigating LoRA for Cross-Lingual Adaptation in Word Inflection

- Fine-tuned ByT5 model for morphological inflection, achieving state-of-the-art results.
- Demonstrated effectiveness of Low Rank Adapters (LoRA).
- Showed benefits of related language pre-training and multi-lingual LoRA models.

Link: https://github.com/vimmoos/LoRA_for_Cross-Lingual_Adaptation_in_Word_Inflection

[01/02/2023 – 01/05/2023]

Boundary Equilibrium GAN

- BEGAN addresses the mode collapse issue in GANs by promoting diverse sample generation
- Replication of the original paper
- Implementation utilizes PyTorch, TorchVision, Numpy, and CUDA.

Link: https://github.com/vimmoos/BE_GAN

[01/05/2020 – 01/08/2020]

Echo State Network for Percussion-based music generation

- Project combines PSO and ESNs to enhance music generation tasks.
- Project uses Python, NumPy, SciPy, and Matplotlib.

Links: https://github.com/vimmoos/Echo_State_Network | https://vimmoos.github.io/Echo_State_Network/

[01/01/2022 – 01/09/2022]

Autoencoder-based Deep Reinforcement Learning for ground-level walking of Human Musculoskeletal models

- Representation Learning, Autoencoders, Variational Inference and Deep Reinforcement Learning
- Pytorch, OpenSim, StableBaselines3,

Link: <https://vimmoos.github.io/bthesis/>

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English

LISTENING C2 READING C2 WRITING C2

SPOKEN PRODUCTION C2 SPOKEN INTERACTION C2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user