

Davide Belli

STAFF MACHINE LEARNING RESEARCHER

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Education

University of Amsterdam

Amsterdam, NL

MSC IN ARTIFICIAL INTELLIGENCE

Sep. 2017 - Sep. 2019

- Graduated **Cum Laude**, GPA 8.8/10 (A+)
- Main Courses: Machine Learning, Computer Vision, NLP, Deep Learning, Reinforcement Learning, Information Retrieval
- Skills and technologies: Python (NumPy, Matplotlib, PyTorch, scikit-learn), MATLAB, Git, LaTeX

University of Trento

Trento, IT

BSc IN COMPUTER SCIENCE

Sep. 2014 - Jul. 2017

- Graduated **Cum Laude**, GPA 110/110
- Main Courses: Algorithms and Data Structures, Programming, Calculus, Linear Algebra, Probability and Statistics, Logic, Databases
- Skills and technologies: C++, Java, Android, Node.js, Git, HTML/CSS, XML

Work Experience

Qualcomm AI Research

Amsterdam, NL

STAFF RESEARCH ENGINEER

Nov. 2019 - Present

- Designed and implemented novel Deep Learning methods for **Perception** (visual and RF domains), **Model Efficiency**, and **Agentic AI** (LLMs):
 - Designed a personalized biometric NN classifier improving accuracy from 90% to 99% AUC on challenging real-world data.
 - Implemented Neural KF and WLS methods for GNSS localisation, reducing positioning error by 50% in noisy urban canyons.
 - Improved efficiency in recent LLMs (Phi 3, Llama 3, Mistral), decreasing memory footprint by 45% and increasing throughput by 40%.
 - Introduced structured representations and architectures in AI Agents, reducing model footprint by 30x at the same task accuracy.
- Integrated solutions in **products released to customers** (Samsung, Google) and **internal departments**. Submitted 11 patent applications.
- Skills and technologies: Python (PyTorch, Hugging Face, NumPy, Matplotlib, Pandas, Hydra), Bash, Git, Docker.

University of Amsterdam

Amsterdam, NL

GRADUATE TEACHING ASSISTANT

Oct. 2018 - Jun. 2019

- Graduate Teaching Assistant for the core courses Machine Learning 1, Deep Learning and Information Retrieval in the MSc AI at UvA.
- Held lab sessions, prepared and corrected exams, homework and lab assignments.

Publications

- H Gorp*, D Belli*, A Jalalirad, B Major. *Neural Augmented Kalman Filters for Road Network assisted GNSS positioning*, **ICML 2025 ML4Wireless workshop**.
- M Federici*, D Belli*, M van Baalen, A Jalalirad, A Skliar, B Major, M Nagel P Whatmough. *Efficient LLM Inference using Dynamic Input Pruning and Cache-Aware Masking*, **MLSys 2025**
- A Jalalirad, D Belli, B Major, S Jee, H Shah, W Morrison, *GNSS Positioning using Cost Function Regulated Multilateration and Graph Neural Networks*, **ION GNSS+ 2023**
- D Belli , D Das, B Major and F Porikli, *Online Adaptive Personalization for Face Anti-spoofing*, **ICIP 2022**.
- D Belli , D Das, B Major and F Porikli, *A Personalized Benchmark for Face Anti-spoofing*, **WACV 2022 MAP-A workshop**.
- D Belli and T Kipf, *Image-Conditioned Graph Generation for Road Network Extraction*, **NeurIPS 2019 GRL workshop**.
- G Bani*, D Belli*, G Dagan*, A Geenen*, A Skliar, A Venkatesh, T Baumgartner, E Bruni and R Fernández, *Adding Object Detection Skills to Visual Dialogue Agents*, **ECCV 2018 SiVL workshop**.
- D Belli, S Hu, E Sogancioglu and B van Ginneken, *Context Encoding Chest X-rays*, **arXiv preprint**.
- E Sogancioglu*, S Hu*, D Belli and B van Ginneken, *Chest X-ray Inpainting with Deep Generative Models*, **arXiv preprint**.

Patents

- Efficient Plan Sampling for Function Calling LLMs without token generation steps. *In preparation*, 2025.
- Deep Learning methods for Road Network assisted GNSS positioning. *US Patent App. 19/299,160*, 2025.
- Test-time Scaling for Single-turn Function Calling. *US Patent App. 19/270,192*, 2025.
- Adaptive personalization for anti-spoofing protection in biometric authentication systems. *US Patent App. 19/202,524*, 2025.
- Geometric representation and temporal modeling for GNSS localization. *US Patent App. 19/040,909*, 2025.
- Cache-aware dynamic module selection. *US Patent App. 18/902,554*, 2025.
- Global navigation satellite systems (gnss) localization with residual grid representation. *US Patent App. 18/630,717*, 2025.
- Optimizing weighted least square (wls) inputs to improve global navigation satellite systems (gnss) localization. *US Patent App. 18/177,713*, 2024.
- Personalized biometric anti-spoofing protection using machine learning and enrollment data. *US Patent App. 17/658,573*, 2022.

Honors & Awards

2022-25	Top 4% : LeetCode contest ranking (Global)	Amsterdam, NL
2024-25	Top 12% : Codeforces contest ranking (Global)	Amsterdam, NL
2019	1st Place : Amsterdam Programming Contest	Amsterdam, NL
2018	Top 50% : ACM-ICPC Nwerc (European Semi-Finals)	Eindhoven, NL
2018	Top 50% : BAPC Regionals	Louvain-la-Neuve, BE
2016	Bronze Medal : ACM-ICPC Swerc (European Semi-Finals)	Porto, PT
2016-19	Top 15% : Google Hashcode	Amsterdam, NL
2008-13	Top 0.1% (7th out of 9000) : International Championships of Mathematical Games (Italian Finals)	Milan, IT

Volunteering

2020-25	Conference Reviewer : WACV (2022-2023-2024-2025), LoG (2023-2024-2025), ICCV (2021)
2020-25	Workshop Reviewer : ML on Graphs (GLF @ NeurIPS 2022-2023, GLB @ WWW 2022-2023, GRL+ @ ICML 2020)
2019-25	Mentor at LeadTheFuture : mentorship organization for selected top students in STEM from Italy.
2017-19	Member and Treasurer at Master Committee : organizing educational events for master students at UvA.
2015-17	School Tutor : teaching Maths, Physics and Computer Science to High School and Bachelor students.