Daniel Barta

CONTACT

Phone: +49 163 6081304
Email: daniel.barta@web.de
Address: Pflügerstr. 4, 12047, Berlin, Germany
LinkedIn: www.linkedin.com/in/daniel-a-barta

PROFILE

Electrical and information engineer specializing in quantum computing, machine learning, and software development. Experienced with machine learning methods, generative AI, and neuro-symbolic reasoning.

PROFESSIONAL EXPERIENCE

Working Student – Quantum Computing and AI
Fraunhofer FOKUS, Berlin | Mar 2023 – Present

Diffusion Models for Quantum Circuit Generation:

- Developed novel diffusion-based generative models for synthesizing parameterized quantum circuits (PQCs), achieving significant improvements in generating high-fidelity GHZ states and optimizing quantum machine learning workflows.

Surrogate Benchmarking for Quantum Architectures:

- Introduced a surrogate model, a Graph Neural Networks (GNNs) for assessing and benchmarking various quantum architecture configurations.

Neuro-Symbolic Autonomous Decision Systems:

- Built symbolic reasoning components within neuro-symbolic frameworks for autonomous driving, ensuring compliance with complex legal and regulatory standards.

Backend & Frontend Software Development:

- Designed and implemented a robust backend and frontend system leveraging the Karma framework for efficient JSON-to-RDF data mapping.

Federated Database Search:

- Developed a federated search solution for simultaneous querying across multiple database systems, returning structured, actionable results.

Intern – Engine and Data Analytics
BMW Group, Munich | Mar 2022 – Aug 2022

- Engineered automated model verification processes, significantly enhancing testing efficiency and accuracy.
- Updated and optimized engine database structures for improved data retrieval and analysis.
- Conducted comprehensive analyses of driving behavior using Python and MATLAB, employing advanced algorithms from game theory and oversampling strategies.

Student Assistant – IT & EDV Support
Ludwig-Maximilians-Universität Munich | Apr 2019 – Apr 2022

- Provided dedicated IT support, maintained systems, and assisted with troubleshooting, ensuring seamless operations within an academic environment.

EDUCATION

Master of Science in Electrical and Information Engineering
Technische Universität Berlin | Sep 2022 – Aug 2025

- Specialization: Quantum Computing, Machine Learning, Optimization, and Communication Systems.

Bachelor of Science in Electrical and Information Engineering
Technische Universität München | Oct 2017 – Aug 2022

- Thesis: "One-Bit Channel Estimation with Generative Adversarial Networks."

PUBLICATIONS

First Author

- "Leveraging Diffusion Models for Parameterized Quantum Circuit Generation," arXiv:2505.20863.

Co-author

- "Surrogate Benchmark for Quantum Architecture Search Using Graph Neural Networks," arXiv:2506.06762.
- "Ensuring Rule Compliance in Autonomous Driving," Springer, DOI:10.1007/978-3-031-72407-7_17.

TECHNICAL SKILLS

Programming
Python (expert), MATLAB/Simulink (advanced), Java (intermediate), C++ (basic)

Machine Learning & AI
PyTorch, TensorFlow, Neuro-symbolic Systems

Languages:
German (native), English (fluent), Romanian (B2), Italian (B1)

Quantum Computing
Qiskit, PennyLane, Cirq, QuantumCircuit Synthesis, PQC Optimization

Tools & Technologies
Git, Docker, Linux, Karma Framework, Federated Systems

INTERESTS

Quantum Computing, AI, Advanced Algorithm Development, Design