BENJAMIN ALT

Innovator and Leader in Robot Intelligence Research

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RELEVANT EXPERIENCE

ArtiMinds Robotics

Karlsruhe, Germany

Senior Team Lead Research *Oct 2024 - today*

- Leading a team of 7 full-time and student researchers
- Coordinating AI technology transfer in customer projects and commercial product development
- Establishing and expanding long-term research partnerships with >20 academic institutions and >15 industry partners
- Leading 8 publicly funded research projects on cognitive robotics with >2M € of grant volume
- Acquiring >800k € of grant volume for 2 publicly funded research projects on advanced industrial robotics

Senior Research Scientist *Jan 2023 - Sep 2024*

- Researched and published on scalable, interpretable artificial intelligence for industrial robots (8 conference papers)
- Acquired and realized 5 publicly funded research projects in excess of 1.4M € of grant volume
- Conducted in-house consulting on AI methods, applications and technology transfer
- Mentored and supervised 14 graduate and undergraduate students

Research Scientist *Oct 2019 - Dec 2022*

- Researched and published on semi-symbolic robot program inference with deep neural networks (5 conference papers, 2 book chapters)
- Implemented and patented a commercial AI solution for the data-driven optimization of industrial production processes
- Acquired and realized 6 publicly funded research projects in excess of 1.5M € of grant volume
- Mentored and supervised 16 graduate and undergraduate students

Junior Software Engineer *Sep 2017 - Aug 2019*

- Developed a solution for data-driven robot program optimization
- Bootstrapped and co-developed a commercial platform for the aggregation, display and analysis of robot process data
- *Associate Trainer*: Training and education of industry customers

EDUCATION

University of Bremen

Bremen, Germany

Ph.D. Computer Science *2020 - today*

- Dissertation: *Neurosymbolic Robot Programming - A Framework for AI-Enabled Programming of Robot Manipulation Tasks* (PDF)
- Advisor: Prof. Michael Beetz, Institute for Artificial Intelligence
- Projected defense date: February 2025

Karlsruhe Institute of Technology

Karlsruhe, Germany

M.Sc. Computer Science *with distinction* *2017 – 2019*

- Thesis: *Automatic Parameterization of Robot Programs via Learning of Neural Program Representations*
- Areas of Specialization: Robotics and Automation; Anthropomatics and Cognitive Systems
- Merit scholarship of the German Acad. Scholarship Foundation (Studienstiftung des deutschen Volkes)

B.Sc. Computer Science *2015 – 2017*

- Thesis: *Machine Learning for Pose Optimization: An Integrated Framework for the Development and Monitoring of Adaptive Robot Programs*

SELECTED PUBLICATIONS

Conference Papers

- B. Alt *et al.*, “Domain-Specific Fine-Tuning of Large Language Models for Interactive Robot Programming”, in *European Robotics Forum 2024*, Springer Nature, 2024. arXiv: 2312.13905 [cs].
- B. Alt *et al.*, “RoboGrind: Intuitive and Interactive Surface Treatment with Industrial Robots”, in *2024 IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2024. DOI: 10.1109/ICRA57147.2024.10611143. arXiv: 2402.16542 [cs].
- B. Alt, F. K. Kenfack, A. Haidu, D. Katic, R. Jäkel, and M. Beetz, “Knowledge-Driven Robot Program Synthesis from Human VR Demonstrations”, in *Proceedings of the 20th International Conference on Principles of Knowledge Representation and Reasoning*, IJCAI, 2023, pp. 34–43. DOI: 10.24963/kr.2023/4.
- B. Alt, D. Katic, R. Jäkel, and M. Beetz, “Heuristic-Free Optimization of Force-Controlled Robot Search Strategies in Stochastic Environments”, in *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022, pp. 8887–8893. DOI: 10.1109/IROS47612.2022.9982093.
- B. Alt, D. Katic, R. Jäkel, A. K. Bozcuoglu, and M. Beetz, “Robot Program Parameter Inference via Differentiable Shadow Program Inversion”, in *2021 IEEE International Conference on Robotics and Automation (ICRA)*, 2021, pp. 4672–4678. DOI: 10.1109/ICRA48506.2021.9561206.

Patents

- B. Alt, R. Jäkel, and D. Katic, “Method and System for Determining Optimized Program Parameters for a Robot Program”, pat. WO2022022784A1, 2022.

Full list of publications: benjaminalt.github.io/publications

SKILLS

Robotics	Task and motion planning, force control, 3D visual perception, robot programming, human-robot interaction, model predictive control, manipulation of deformable objects
Machine learning	Deep learning, imitation learning, learning from demonstration, differentiable programming, model-based optimization, interpretability, informed machine learning
Research management	Grant acquisition, science communication, stakeholder management, technology transfer, strategic planning
Leadership	Team leadership, mentoring, talent acquisition
Programming languages	Python (8 years of professional experience), C++ (3 years), Prolog (1 year), Java
Development tools	Git, DVC, Jira, CMake, Jenkins CI
Frameworks	PyTorch, NumPy, Keras, ROS, Qt

Karlsruhe, December 5, 2024

Benjamin Alt