

# Benjamin Alt

☎ +49 160 8548454

@ benjamin.alt@uni-bremen.de

🔗 benjaminalt.github.io

🔄 benjaminalt

in linkedin.com/in/benjamin-alt

## RELEVANT PROFESSIONAL EXPERIENCE

### AICOR Institute for Artificial Intelligence, University of Bremen

📍 Bremen, Germany

#### Technical Director

Apr 2025 - today

- Develop an ecosystem for open-source cognitive robotics
- Establish a deep and broad network of research and industry partners
- Acquire funding for research and technology transfer
- Coordinate technology transfer activities

### ArtiMinds Robotics

📍 Karlsruhe, Germany

#### Senior Team Lead Research

Oct 2024 - Mar 2025

- Led a team of 7 full-time and student researchers
- Coordinated AI technology transfer in customer projects and commercial product development
- Established and expanding long-term research partnerships with >20 academic institutions and >15 industry partners
- Led 8 publicly funded research projects on cognitive robotics with >2M € of grant volume
- Acquired >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

## EDUCATION

### University of Bremen

📍 Bremen, Germany

#### Ph.D. Computer Science *cum laude*

2020 - 2025

- Dissertation: *Neurosymbolic Robot Programming - A Framework for AI-Enabled Programming of Robot Manipulation Tasks* (📄 PDF)
- Advisor: Prof. Michael Beetz, AICOR Institute for Artificial Intelligence

### 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*

### Institut d'Études Politiques de Paris (SciencesPo)

📍 Reims, France

#### B.A. Political Science *summa cum laude*

2012 - 2015

Reims, France

- Areas of Specialization: Law, History, Economics
- 2014-2015 at Princeton University with a focus on Mathematics & Computer Science

# SELECTED PUBLICATIONS

## Conference Papers

- B. Alt, C. Kienle, D. Katic, R. Jäkel, and M. Beetz, “Shadow Program Inversion with Differentiable Planning: A Framework for Unified Robot Program Parameter and Trajectory Optimization”, in *2025 IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2025. doi: 10.48550/arXiv.2409.08678. arXiv: 2409.08678 [cs].
- B. Alt et al., “Domain-Specific Fine-Tuning of Large Language Models for Interactive Robot Programming”, in *European Robotics Forum 2024*, C. Secchi and L. Marconi, Eds., vol. 32, Springer Nature Switzerland, 2024, pp. 274–279. doi: 10.1007/978-3-031-76424-0\_49. 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, pp. 1–8. 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)*, IEEE, 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)*, IEEE, 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.

2 book chapters, 1 journal article (peer reviewed), 15 conference papers (all peer reviewed), 2 workshop publications.  
Full list of publications: [benjaminalt.github.io/publications](https://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
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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, June 25, 2025

Benjamin Alt