CURRICULUM VITAE

PERSONAL INFORMATION

Jan Kristof Behrens

Current position:	Postdoctoral Researcher
Name of institution:	Czech Technical University in Prague
Department:	Robot and Machine Perception at Czech Institute of Informatics, Robotics and Cybernetics
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SUMMARY OF PROFESSIONAL EXPERIENCE

I conduct research at the intersection of planning and scheduling, robot control, and human-robot collaboration, with a passion for solid software engineering and fluent user experience. My expertise is in constraint programming (discrete optimization) and task and motion planning. During my scientific career, I developed optimization technologies to efficiently operate small (e.g., hybrid cars, robots) and large (e.g., chemical plants or multi-agent systems) systems. I have thrived in diverse working conditions while contributing to different research projects, served as a treasurer and board member of an aeroclub, and visited and collaborated with research labs abroad. Leveraging my broad international network of collaborators, I organized several talks with renowned experts from abroad in a seminar series at our institute. I presented my work at international conferences and workshops and gave talks as an invited speaker.

Education

2022 Ph.D, magna cum laude
University of Bremen, Germany

2015 M.Sc. Automation Engineering
RWTH Aachen University, Germany

2013 B.Sc. Mechanical Engineering, specialization Chemical Engineering
RWTH Aachen University, Germany

Work Experience

2016 - 2019 Industrial Doctorate Program, Corporate Research sector at Robert Bosch GmbH

- Conducting original research on the topic of uncertainty-aware decision-making for flexible industrial production.
- Identifying the potential and possible pathways how the Robert Bosch GmbH could utilize advanced robotic technologies in their
  extensive portfolio of production facilities.
- Presenting my findings internally and at international conferences.

2009 - 2015 Student assistant in teaching and research
RWTH Aachen University, Faculty of Mechanical Engineering, IMA ZLW & IfU

- Teaching information technology and software engineering to engineering students, conceptualizing the tasks for the practical lab sessions.
- Developing state estimation and control algorithms for mobile manipulators.
- Conducting user studies.

Projects

- Robotics and Advanced Industrial Production (ROBOPROX), funded under the Excellent Research scheme. I co-wrote the research activity Human-Robot Collaboration, and I lead the task regarding planning and scheduling in HRC. I am involved in hiring Ph.D. candidates.
- Next generation of AI-powered robots for agile production (AGIMUS), a HORIZON Europe Research & Innovation Action project: I contribute as a team member to the topics of fast 6DoF object pose estimation, robot control, and advanced calibration methods.
- The RoboTwin project was funded by EIT Manufacturing. I contributed and advised regarding trajectory smoothing and tool-tip calibration.
- MIRACLE, funded by the Czech Grant Agency. I was responsible for bringing in my expertise in robot control to support the research on multi-modal action representation.
- Interactive Perception-Action-Learning for Modelling Objects (IPALM), a chist-era project, where I contributed to embodied reasoning systems, multi-modal object exploration, and simulation of soft objects.
- Robotics for Industry 4.0 (R4I), co-funded by the European Regional Development Fund within the Excellent Research Teams scheme. Postdoctoral researcher and building a robotic lab for Human-Robot Collaboration. I hosted several international speakers and visiting collaborators.
- Robotic Software Engineering (ROSE) was a project at Bosch Corporate Research, where we developed and adapted best practices and tools for robotic software development within the Bosch company. Next to improving the industry standard ROS, we also used formal methods and advanced continuous integration to serve robotics development better.

Teaching Experience

- Supervising B.Sc. and M.Sc. students (4)
- Conception and teaching of lecture accompanying lab for informatics for mechanical engineers (1600 students per year)
- Reading club lectures

Service to the Community

Reviewer for international journals and conferences: ICRA, IROS, IJRR, RA-L, RO-MAN

Invited Talks

- 2023, Delft, Netherlands (invited by Jens Kober)
- 2020, Prague, Czech Republic (invited by Zdeněk Hanzalek)
- 2018, Prague, Czech Republic (invited by Václav Hlaváč)
- 2017, Oerebro, Sweden (invited by Masoumeh Mansour and Federico Pecora)

Professional Membership

IEEE

Research Visits

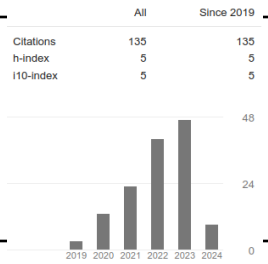
- 2016, 2017, 2018 Research stays, Institute for Artificial Intelligence, Bremen, Germany
- 2016 Lucia Winterschool, Örebro, Sweden
- 2017 Research stay, Örebro, Sweden
- 2023, AGIMUS Summerschool, Banyuls, France
- 2023, Research visit, Delft University, Netherlands

Leadership Skills

2011 - 2015 Treasurer and board member of the Gliding Club at RWTH Aachen (FTHA e.V.)
- Approximately 90 members, Club value ca. 250.000 €

Publication Metrics

I mainly publish papers in top-tier robotics conferences and journals. I am the first author of 4 papers and have published 11 papers without my PhD supervisors. The reported statistics have been obtained from Google Scholar (26/03/2024).



International journals: 4
International conferences:6
International workshops: 3
Total number of citations: 135
h-index (GS): 5
h-index (SCOPUS): 4
i-index (GS): 5

Publications

1. M. Fourmy, V. Priban, J. K. Behrens, N. Mansard, J. Sivic, and V. Petrik, “Visually Guided Model Predictive Robot Control via 6D Object Pose Localization and Tracking,” arXiv preprint arXiv:2311.05344, 2023.
2. M. Ionova, P. Vanc, and J. K. Behrens, “Online Scheduling and Reactive Behaviors for Effective Human-Robot-Collaboration,” 2023.
3. J. Sedlar et al., “Imitrob: Imitation learning dataset for training and evaluating 6D object pose estimators,” IEEE Robotics and Automation Letters, vol. 8, no. 5, pp. 2788–2795, 2023.
4. P. Vanc, J. K. Behrens, K. Stepanova, and V. Hlavac, “Communicating human intent to a robotic companion by multi-type gesture sentences,” in 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), IEEE, 2023, pp. 9839–9845.
5. P. Vanc, J. K. Behrens, and K. Stepanova, “Context-aware robot control using gesture episodes,” in 2023 IEEE International Conference on Robotics and Automation (ICRA), IEEE, 2023, pp. 9530–9536.
6. L. Rustler, J. Lundell, J. K. Behrens, V. Kyrki, and M. Hoffmann, “Active visuo-haptic object shape completion,” IEEE Robotics and Automation Letters, vol. 7, no. 2, pp. 5254–5261, 2022.
7. R. Škoviera, J. K. Behrens, and K. Štěpánová, “SurfMan: Generating Smooth End-Effector Trajectories on 3D Object Surfaces for Human-Demonstrated Pattern Sequence,” IEEE Robotics and Automation Letters, vol. 7, no. 4, pp. 9183–9190, 2022.
8. J. K. Behrens, “Integrated Task and Motion Scheduling for Flexible Manufacturing,” Ph.D. Thesis, Universität Bremen, 2022.
9. P. Vanc, K. Stepanova, and J. K. Behrens, “Controlling robotic manipulations via bimanual gesture sequences,” in 2022 IEEE International Conference on Robotics and Automation (ICRA) Workshop, 2022, p. 2.
10. J. K. Behrens, M. Nazarczuk, K. Stepanova, M. Hoffmann, Y. Demiris, and K. Mikolajczyk, “Embodied Reasoning for Discovering Object Properties via Manipulation,” in 2021 IEEE International Conference on Robotics and Automation (ICRA), IEEE, 2021, pp. 10139–10145.
11. J. K. Behrens, K. Stepanova, and R. Babuska, “Simultaneous task allocation and motion scheduling for complex tasks executed by multiple robots,” in 2020 IEEE International Conference on Robotics and Automation (ICRA), IEEE, 2020, pp. 11443–11449.
12. J. K. Behrens, K. Stepanova, R. Lange, and R. Skoviera, “Specifying dual-arm robot planning problems through natural language and demonstration,” IEEE Robotics and Automation Letters, vol. 4, no. 3, pp. 2622–2629, 2019.
13. J. K. Behrens, R. Lange, and M. Mansouri, “A constraint programming approach to simultaneous task allocation and motion scheduling for industrial dual-arm manipulation tasks,” in 2019 International Conference on Robotics and Automation (ICRA), IEEE, 2019, pp. 8705–8711.
14. P. Svarny, M. Tesar, J. K. Behrens, and M. Hoffmann, “Safe physical HRI: Toward a unified treatment of speed and separation monitoring together with power and force limiting,” in 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), IEEE, 2019, pp. 7580–7587.