Piotr Kicki

Poznań

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Education

2019–2023 **Robotics**, *Poznan University of Technology*, PhD Studies.
Thesis: *Deep reinforcement learning for motion planning in man-made environments* (not defended yet)

2018–2019 **Automatic Control and Robotics**, *Poznan University of Technology*, Master of Science Engineer.
Individual study programme with additional math and computer science courses
Graduated with distinction, Summa cum laude (one of best 5 of about 2000 alumni)
Thesis: *Motion algorithmization of the intelligent articulated buses in the presence of the state and input constraints*
GPA: 4.95/5.0

2014–2018 **Automatic Control and Robotics**, *Poznan University of Technology*, Bachelor of Engineering.
Graduated with distinction
Thesis: *Design and experimental verification of a control system dedicated to an omnidirectional wheeled robot.*
GPA: 4.84/5.0

Experience

Vocational

7.2018–present **Research Assistant**, *Poznan University of Technology*, Poznan.
Working on motion panning algorithms, deformable objects perception and manipulation, and material and terrain classification using Deep Neural Networks
Participating in research grants: H2020 REMODEL and "Perception and control for elastic objects manipulation" from National Centre of Research and Development

6.2022–8.2022 **PhD Internship**, *Technische Universität Darmstadt*, Germany.
Working on motion planning for KUKA LBR Iiwa 14 manipulator in the game of robotic Air Hockey under supervision of Jan Peters and Davide Tateo.

7.2017–9.2017 **Internship (Machine Learning and NLP)**, *Samsung R&D Institute Poland, Warsaw & SIDI Brazil, Campinas*.
Worked on data and machine learning algorithms for Natural Language Processing.

5.2017–6.2017 **Software Developer**, *Poznan Supercomputing and Networking Center*, Poznan.
Software development internship in ICT Security Department. Participation in H2020 SymbIoTe project - programming in Java.

7.2014– **Software Developer**, *Content Forces Polska*, Poznan.
5.2017 Backend web applications development using PHP and Python
Worked on multiple projects including:
- job offers and CV matching
- named entities extraction from CVs and job offers
- job portal for Dutch students (`http://stageafstudeerportal.nl/`)
- package tracking application

Publications

2024 **Learning Quasi-Static 3D Models of Markerless Deformable Linear Objects for Bimanual Robotic Manipulation**
P. Kicki, M. Bidziński, K. Walas
under review for Robotics and Automation Letters

2024 **Deformable Linear Objects Manipulation with Online Model Parameters Estimation**
A. Caporali, **P. Kicki**, K. Galassi, R. Zanella, K. Walas, G. Palli
IEEE Robotics and Automation Letters

2024 **Fast Kinodynamic Planning on the Constraint Manifold with Deep Neural Networks**
P. Kicki, P. Liu, D. Tateo, H. Bou-Ammar, K. Walas, P. Skrzypczyński, J. Peters
IEEE Transactions on Robotics

2023 **DLOFTBs – Fast Tracking of Deformable Linear Objects with B-splines**
P. Kicki, A. Szymko, K. Walas
International Conference on Robotics and Automation, ICRA 2023

2023 **Towards Fast Kinodynamic Planning on the Constraint Manifold with Deep Neural Networks**
P. Kicki, P. Liu, D. Tateo, K. Walas, P. Skrzypczyński, J. Peters
Agile Movements: Animal Behavior, Biomechanics, and Robot Devices, ICRA 2023 Workshop

2023 **Towards learning quasi-static models of markerless deformable linear objects for bimanual robotic manipulation**
M. Bidziński, **P. Kicki**, K. Walas
3rd Workshop on Representing and Manipulating Deformable Objects, ICRA 2023 Workshop

2023 **Copy and Paste Augmentation for Deformable Wiring Harness Bags Segmentation**
B. L. Žagar, A. Caporali, A. Szymko, **P. Kicki**, K. Walas, G. Palli, A. Knoll
IEEE/ASME International Conference on Advanced Intelligent Mechatronics

2022 **Speeding up DNN-based planning of local car maneuvers via efficient B-spline path construction**
P. Kicki, P. Skrzypczyński
International Conference on Robotics and Automation, ICRA 2022

2022 **Tuning of the Extended State Observer with Neural Network-based Control Performance Assessment**
P. Kicki, K. Łakomy, KMB Lee
European Journal of Control

2022 **Active Disturbance Rejection Control Design with Suppression of Sensor Noise Effects in Application to DC-DC Buck Power Converter**
K. Lakomy, R. Madonski, B. Dai, J. Yang, **P. Kicki**, M. Ansari, S. Li
IEEE Transactions on Industrial Electronics

2021 **Speeding up DNN-based planning of local maneuvers via efficient B-spline path construction**
P. Kicki, P. Skrzypczyński
Combining Learning and Motion Planning, IROS 2021 Workshop

2021 **A New Approach to Design Symmetry Invariant Neural Networks**
P. Kicki, P. Skrzypczyński, M. Ozay
International Joint Conference on Neural Networks

2021 **Learning from Experience for Rapid Generation of Local Car Maneuvers**
P. Kicki, T. Gawron, K. Ćwian, M. Ozay, P Skrzypczyński
Engineering Applications of Artificial Intelligence

2021 **Tell Me, What Do You See? — Interpretable Classification of Wiring Harness Branches with Deep Neural Networks**
P. Kicki, M. Bednarek, P. Lembicz, G. Mierzwiak, A. Szymko, M. Kraft, K. Walas
Sensors

2021 **Gaining a Sense of Touch Object Stiffness Estimation Using a Soft Gripper and Neural Networks**
M. Bednarek, **P. Kicki**, J. Bednarek, K. Walas
Electronics, Special Issue: Artificial Intelligence and Ambient Intelligence

2020 **A New Neural Network Architecture Invariant to the Action of Symmetry Subgroups (contributed talk)**
P. Kicki, M. Ozay, P. Skrzypczyński
Differential Geometry meets Deep Learning, NeurIPS 2020 Workshop

2020 **Learning Rapid Maneuver Planning for Car-Like Vehicles Using Gradient-based Policy Search**
P. Kicki, T. Gawron, P. Skrzypczyński
Learning (in) Task and Motion Planning, RSS 2020 Workshop

2020 **On Robustness of Multi-modal Fusion – Robotics Prespective**
M. Bednarek, **P. Kicki**, K. Walas
Electronics, Special Issue: Artificial Intelligence and Ambient Intelligence

2019 **Friction from Reflectance: Transfer Learning Approach** (Excellent Oral Presentation Award)
P. Kicki, K. Walas
2019 4th International Conference on Robotics and Automation Engineering

2019 **Robotic Manipulation of Elongated and Elastic Objects**
P. Kicki, M. Bednarek, K. Walas
2019 23rd Signal Processing: Algorithms, Architectures, Arrangements, and Applications

2019 **Robotic Touch: Classification of Materials for Manipulation and Walking**
J. Bednarek, M. Bednarek, **P. Kicki**, K. Walas
2019 2nd IEEE International Conference on Soft Robotics

2018 **Measuring Bending Angle and Hallucinating Shape of Elongated Deformable Objects**
P. Kicki, M. Bednarek, K. Walas
2018 IEEE-RAS 18th International Conference on Humanoid Robots

Achievements

2023 **Rector's award for scientific achievements**.
For excellent publications and scientific work

2023 **ICRA Travel Grant**.
Travel grant to support participation in International Conference on Robotics and Automation in London

2022 **Learning versatile legged robot locomotion with active perception**, NCN OPUS LAP.
Participated in the preparation of the accepted OPUS LAP grant application proposal.

2022 **MOBILITY I Grant**, NAWA STER Program.
Grant for an internship in the Jan Peters group at the Technical University of Darmstadt, Germany. Worked on learning how to plan robot motions.

2022 **ICRA Travel Grant**.
Travel grant to support participation in International Conference on Robotics and Automation in Philadelphia

2021 **Rector's scholarship for the best PhD students**.
For excellent publications and scientific work

2019 **National competition for the best master's thesis in the field of information technology and its applications**, Distinction.
Motion algorithmization of the intelligent articulated buses in the presence of the state and input constraints

2019 **Excellent Oral Presentation Award**.
4th International Conference on Robotics and Automation Engineering

2019 **The Medal "An outstanding graduate of the Poznań University of Technology"**.
Received by the top 5 graduates

2019 **ADDICTon 2019**, *anti-addictions hackathon*, 1st place.
We have developed a simulator that uses video processing and robotic manipulation to make people aware of the negative effects of alcohol consumption.

2016 **Let's Roq challenge**, *machine learning competition*, 5th place.
We developed the machine learning algorithm for the identification of electronic devices belonging to the same user.

2015–2019 **Rector's scholarship for the best students**, 8 times.

Languages

Polish	**Proficient**	*Native speaker*
English	**Upper Intermediate**	*Used commonly at work*

Technical skills

- Robotics
- Machine Learning
- Robot motion planning
- Programming in Python and C++
- Tensorflow and Numpy
- Familiar with bash and git
- Basics of OpenCV library and ROS2

Skills and abilities

- Analytic and abstract thinking
- Quick learning
- Teamwork
- Creativity

Interests

- Machine Learning
- Motion planning
- Football
- Mountain hiking