Sarah Bechtle

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research interests

My research interests are at the intersection between machine learning and robotics - developing learning algorithms that can be deployed on robots. Specifically I'm interested in model based learning within the action-perception-learning loop of artificial agents with special interest in meta and lifelong learning for robots.

education

Max Planck Institute for Intelligent Systems, Tübingen, Germany
Ph.D in Computer Science *October 2017 - expected Fall 2021*
Supervised by: *Ludovic Righetti (NYU), Franziska Meier (FAIR) and Stefan Schaal (Google Inc.)*
Affiliated with: *Computational Learning and Motor Control Lab at USC, Los Angeles and the Machines in Motion Lab at NYU, New York.*

Bernstein Center for Computational Neuroscience, Berlin, Germany
Master of Science in Computational Neuroscience *September 2013 - August 2016*
Thesis: 'Sensorimotor Learning and Development of Sense of Object Permanence in Robots', Grade:1.0 (= 4.0 GPA)

Ludwig-Maximilians University, Munich, Germany
Bachelor of Science in Media Informatics *September 2009 - September 2012*
Thesis: 'Emotion Recognition from Physiological Signals', Grade:1.0 (= 4.0 GPA)

research appointments

Facebook AI Research (FAIR), Menlo Park, CA
Research Scientist Intern *June 2020 - January 2021*
Intern at FAIR robotics, working on multi-modal model learning, merging proprioception and vision for object manipulation task on the Kuka iiwa 7

Facebook AI Research (FAIR), Menlo Park, CA
Research Scientist Intern *January 2019 - May 2019*
Intern at FAIR robotics, working on uncertainty driven model based reinforcement learning for motor control on the Sawyer robot

California Institute of Technology /
NASA Jet Propulsion Laboratory, Los Angeles, CA
Research Scientist *September 2016 - September 2017*
Affiliated with the Computer Vision Lab of the department of Computation and Neural Systems and the Robotic Systems Estimation, Decision and Control Group.

Cognitive Robotics Lab, Humboldt Universität zu Berlin, Germany
Personal Robotics Lab, Imperial College, London, U.K
Graduate student researcher *April 2014 - June 2015*

BMW Group Research and Development, Munich, Germany
Undergraduate student research intern *June 2012 - January 2013*

awards and honors

2021: Piero Zamperoni ***best overall Student Paper Award*** *at the IEEE International Conference for Pattern Recognition 2020 for the paper "Meta Learning via Learned Loss". (0.07%)*

2019: Paper "Curious iLQR: Resolving Uncertainty in Model-based RL" was selected for oral presentation at the Conference on Robot Learning (CoRL). (5.0%)

2017: Humboldt Research Track Scholarship awarded by the Humboldt University office for promotion of young researchers in the excellence initiative.

2016: Research scholarships awarded by the commission of women's representative of Humboldt University, Berlin.

2015: Research scholarships awarded by the commission of women's representative of Humboldt University, Berlin.

2015: Erasmus Plus scholarship for research stay at Imperial College London.

publications

1. *Bechtle, S., Hammoud, B., Rai, A., Meier, F. and Righetti, L., 2021. Leveraging Forward Model Prediction Error for Learning Control. IEEE International Conference on Robotics and Automation(ICRA).*
2. *Das, N., Bechtle, S., Davchev, T., Jayaraman, D., Rai, A. and Meier, F., 2020. Model-Based Inverse Reinforcement Learning from Visual Demonstrations. In Conference on Robot Learning.*
3. *Bechtle, S., Molchanov, A., Chebotar, Y., Grefenstette, E., Righetti, L., Sukhatme, G. and Meier, F., 2020. Meta-learning via learned loss. IEEE International Conference on Pattern Recognition.*
4. *Bechtle, S., Lin, Y., Rai, A., Righetti, L. and Meier, F., 2019, May. Curious ilqr: Resolving uncertainty in model-based rl. In Conference on Robot Learning (pp. 162-171). PMLR.*
5. *Bechtle, S., Schillaci, G. and Hafner, V.V., 2016, September. On the sense of agency and of object permanence in robots. In 2016 Joint IEEE International Conference on Development and Learning and Epigenetic Robotics (ICDL-EpiRob) (pp. 166-171).*
6. *Bechtle, S., Schillaci, G. and Hafner, V.V., 2015, August. First steps towards the development of the sense of object permanence in robots. In 2015 Joint IEEE International Conference on Development and Learning and Epigenetic Robotics (ICDL-EpiRob) (pp. 283-284).*

preprints

1. *Bechtle, S., Das, N. and Meier, F., 2020. Learning Extended Body Schemas from Visual Keypoints for Object Manipulation. arXiv preprint arXiv:2011.03882.*
2. *Lin, Y., Bechtle, S., Righetti, L., Rai, A. and Meier, F., 2019. Exploring by Exploiting Bad Models in Model-Based Reinforcement Learning.*

professional services

2021: Workshop Organizer for the Learning to Learn workshop at the Ninth International Conference on Learning Representations (ICLR).

2021: Workshop Organizer for the Learning to Learn for Robotics workshop at the IEEE International Conference of Robotics and Automation (ICRA).

invited talks

2020: "Resolving Uncertainty in Model-Based RL", University of Edinburgh Dynamics Modelling Seminar.

2019: "Curious iLQR, Resolving Model Uncertainty in Model-Based RL", Facebook AI Research Reinforcement Learning Reading Group.

2017: "Development of sense of Object Permanence in Robots", Group Meeting of the Autonomous Motion Department, Max-Planck Institute for Intelligent Systems.

student supervision

- *Vincent Lu (NYU, Undergraduate student project)*
  Differentiable Dynamics for Floating-Based Systems
- *Diego Pozo (NYU, Graduate student project)*
  Model Bias in Model-Based RL

reviewing

- *IEEE Transactions on Robotics (T-RO)*
- *IEEE International Conference on Robotics and Automation (ICRA)*
- *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*
- *Conference on Robot Learning (CoRL)*
- *Robotics: Science and Systems (RSS)*
- *Joint IEEE International Conference on Development and Learning and Epigenetic Robotics (ICDL-EpiRob)*