maximilian.sieb@gmail.com
https://msieb1.github.io

Maximilian Sieb

Research Interests: Perception & Control, Reinforcement Learning, Computer Vision, Representation Learning

EDUCATION

Technical University Darmstadt, Darmstadt   February 2020
M. Sc. Computational Engineering   GPA: 3.79/4.00
  Specialization: Computational Robotics

Carnegie Mellon University, Pittsburgh, USA   May 2019
M. Sc. Robotics   Major GPA: 3.92/4.00
  Research topic: Visual Imitation Learning for Robot Manipulation
  Advisors: Katerina Fragkiadaki & Oliver Kroemer
  Courses: 10701 Machine Learning, 10703 Reinforcement Learning & Control, 16831 RoboStats
      10707 Deep Learning, 10725 Convex Optimization, 16824 Visual Learning & Recognition

Technical University Darmstadt, Darmstadt   October 2016
B. Sc. Mechanical and Process Engineering   GPA: 3.72/4.00
  Specialization: Control Theory and Robotics

WORK & RESEARCH EXPERIENCE

Research Engineer   Emeryville, USA
Covariant   Aug 2019 – today
- Project lead for grasp prediction components involving suction-based robot manipulation
- Researched prototype for 3D perception learning & integrated solution for several applications
- Developed deep neural network model to track object instances & led integration into production
- Prototyped company's first learning-based grasp prediction architecture

Research Assistant   Pittsburgh, USA
CMU, *Intelligent Autonomous Manipulation Laboratory*   Aug 2017 – May 2019
- Learning from Demonstration – Goal: Visual Imitation Learning of Human Demonstrations for Robot Manipulation
- Setup of Multi-View Computer Vision Architecture using RGB-D cameras and Baxter robot – designed Object Detection algorithm using Mask R-CNN framework to characterize relevant objects in the scene – implemented model-based Reinforcement Learning algorithms to enable robot to acquire manipulation skills
- Implemented ConvNet based learning architecture for Unsupervised Visual Feature Extraction to analyze objects' pose change over time

Research Assistant   Pittsburgh, USA
CMU, *IARPA DIVA Program*   Aug 2017 – Aug 2018
- Goal: Develop robust and fully automatized Activity Recognition Algorithm for Real Time Video Analysis as part of Deep Intermodal Video Analytics (DIVA) Team at CMU
- Implemented classification algorithm using deep learning methods – classification of person and vehicle related activities, both temporally and spatially

Embedded Software Engineering, Intern   Deer Park, USA
Continental   June 2016 - Sep 2016
- Developed and implemented fully automatized tests using hardware-in-the-loop simulation for a transmission control system
- Conducted experimental verification of electrical components of the control system using waveform generators
- Participated in code reviews and created both product and software documentation for customer

PUBLICATIONS

Mihir Prabhudesai, Hsiao-Yu Fish Tung, Syed Ashar Javed, **Maximilian Sieb**, Adam W Harley, Katerina Fragkiadaki. "Embodied Language Grounding with Implicit 3D Visual Feature Representations", IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Seattle, USA, June 2020.

Maximilian Sieb*, Xian Zhou*, Audrey Huang, Katerina Fragkiadaki, Oliver Kroemer. "Graph-Structured Visual Imitation", Conference of Robot Learning (CoRL), 2019, Spotlight presentation.

Maximilian Sieb, Katerina Fragkiadaki, "Data Dreaming for Object Detection: Learning Object-Centric State Representations for Visual Imitation", IEEE-RAS International Conference on Humanoid Robots 2018 (Humanoids), Oral presentation.

PROJECTS

CMU   (2017 – today)
- Investigated use of Conditional Variational Autoencoders to encode multimodal stochastic policies from given demonstrations
- Investigated different optimization techniques to learn a shared embedding space from single word embedding spaces
- Learned interpretable image-caption embeddings using metric learning and recurrent neural architectures

TU Darmstadt   (2015 – 2016)
- Investigated use of High-Gain Observers for State-Estimation
- Implemented trajectory segmentation algorithm based on Hierarchical Dirichlet Processes to model Switching Linear System Dynamics
- Built ball-balancing plate capable of moving ball along desired trajectory – integrated microcontroller and implemented nonlinear control algorithms (bachelor thesis)

SKILLS

- *Programming Languages:* Python, C++, C, Matlab, Java
- *Applications and Libraries:* Tensorflow, Pytorch, ROS, Colmap, RLLab, PCL, Git, LabVIEW, CVX, OpenPose
- *3D-Design:* NX 9.0, Solidworks

AWARDS

- German National Academic Foundation Fellow
- German Academic Exchange Service Fellowship
- German National Scholarship
- Ulderup Foundation Fellow
- Thomas-Weiland Foundation Fellow

LEADERSHIP

- Co-Founder of Applied Machine Learning Club, CMU
- Robotics Institute Graduate Student Assembly Representative, CMU
- NavTalent (Professional Network), Associate
- Student Initiative for Children, TUD, Organizer and Tutor, Germany