Andreas Eitel

University of Freiburg
Department of Computer Science
Autonomous Intelligent Systems
Georges-Koehler-Allee 80
79110 Freiburg im Br., Germany
eitel@cs.uni-freiburg.de
www.informatik.uni-freiburg.de/∼eitel

Research Interests

Object recognition, robot manipulation, robot learning, deep reinforcement learning

Education

University of Freiburg — June 2014 - Present
PhD Student in Computer Science
Advised by Prof. Wolfram Burgard

University of Stuttgart — November 2007 - April 2014
Diploma in Mechanical Engineering

Research Experience

University of Freiburg, Prof. Wolfram Burgard
PhD Student

- **Modeling Spatial Relationships between Objects** The goal of this work is to learn representations that provide robots with the ability to understand arbitrary spatial relations between objects and to imitate spatial relations acquired from visual demonstrations with novel objects of various sizes and shapes. Imitating spatial relations is a desirable skill for future service robots that will perform manipulation tasks in human-centered environments.
- **Object Singulation through Robot Manipulation** The goal of this work is to teach a robot how to manipulate in unstructured environments such as cluttered objects on tables. We train a deep convolutional neural network on RGB-D images to separate unknown objects in clutter by push manipulation actions.
- **Sensor Fusion for Object Detection** The goal of this work is to develop a novel adaptive sensor fusion approach for object detection from RGB-D images. We apply our method to the task of people detection for mobile robot platforms and show increased robustness to sensor and environment noise.
- **Multimodal RGB-D Object Recognition:** The goal of this work is to train a multimodal deep convolutional neural network for object recognition tasks using RGB-D data. An important component of this work is a technique to fuse multiple modalities and an effective depth information encoding method.

Conference Publications

Optimization Beyond the Convolution: Generalizing Spatial Relations with End-to-End Metric Learning
Philipp Jund, Andreas Eitel, Nichola Abdo, Wolfram Burgard
International Conference on Robotics and Automation (ICRA), Brisbane, Australia, 2018, Best Paper Award in Robot Vision

Learning to Singulate Objects using a Push Proposal Network
Andreas Eitel, Nico Hauff, Wolfram Burgard

International Symposium on Robotics Research (ISRR), 2017

Deep Detection of People and their Mobility Aids for a Hospital Robot
Andres Vasquez, Marina Kollmitz, Andreas Eitel, Wolfram Burgard
European Conference on Mobile Robotics (ECMR), 2017

Choosing Smartly: Adaptive Multimodal Fusion for Object Detection in Changing Environments
Oier Mees, Andreas Eitel, Wolfram Burgard
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2016

Multimodal Deep Learning for Robust RGB-D Object Recognition
Andreas Eitel, Jost Tobias Springenberg, Luciano Spinello, Martin Riedmiller, Wolfram Burgard
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2015

Other Publications

From Plants to Landmarks: Time-invariant Plant Localization that uses Deep Pose Regression in Agricultural Fields
Florian Kraemer, Alexander Schaefer, Andreas Eitel, Johan Vertens, Wolfram Burgard
Workshop on Agri-Food Robotics, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2017

The Freiburg Groceries Dataset
Philipp Jund, Nichola Abdo, Andreas Eitel, Wolfram Burgard
arXiv CoRR, 2016

Teaching Experience

Laboratory for Autonomous Driving — Summer 2018
Prof. Wolfram Burgard, Teaching Assistant

Laboratory for Deep Learning — Winter 2017/2018
Prof. Wolfram Burgard, Teaching Assistant

Laboratory for Deep Learning — Winter 2016/2017
Prof. Wolfram Burgard, Jun-Prof. Joschka Boedecker
Teaching Assistant

Seminar on Robot Learning — Winter 2014/2015
Prof. Wolfram Burgard, Teaching Assistant

Course on Robot Mapping — Winter 2014/2015
Prof. Wolfram Burgard, Teaching Assistant

Computer Skills

Programming Languages: C++, Python
Software: ROS, Tensorflow, OpenCV, Point Cloud Library
Operating Systems: Linux, Windows