Vít Zeman

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Experience

Researcher, Czech Technical University in Prague, Czech Institute of Robotics, Informatics and Robotics, Testbed for Industry 4.0; Prague, Czechia — Since 2/2024

- **Research focus:** Computer vision and machine learning in industrial applications
- As a member of a computer vision team, I collaborated on multiple projects and research papers
- I specialized in deploying and creating state-of-the-art (SOTA) algorithms and methods in real robotic cells. My focus was on utilizing AI/ML for 2D detections and 6D Pose Estimation, primarily with RGB cameras. This involved extensive knowledge and application of intrinsic and extrinsic camera calibration. Additionally, I explored the use of Neural Radiance Fields and other novel implicit representation methods, as well as Large Language and Vision Models in industrial settings

Intern - Researcher, Czech Technical University in Prague, Czech Institute of Robotics, Informatics and Robotics, Testbed for Industry 4.0; Prague, Czechia — 7/2022-9/2022; 7/2023-12/2023

- **2023:** Deployed 3D reconstruction methods based on sets of RGB images of custom 3D-printed parts and PCBs for 6D Pose Estimation, based on the render-and-compare principle
- **2022:** As a continuation of a teamwork project, I implemented computer vision algorithms into a Pick-and-Place cell, which consisted of an RGB-D camera, a conveyor belt, and a Kuka KR robotic manipulator

Education

Czech Technical University in Prague, Faculty of Electrical Engineering — 7/2021 – 2/2024

- **Masters programme:** Cybernetics and Robotics
- **Thesis:** Benchmarking 6D Object Pose Estimation for the Pick and Place Task
- **Coursework:** Control Theory, Robotics, Artificial Intelligence, Computer Vision, Diagnostics and Sensors

Czech Technical University in Prague, Faculty of Electrical Engineering — 9/2017 – 6/2021

- **Bachelors programme:** Cybernetics and Robotics
- **Thesis:** News Article Layout Extraction from Bitmaps Files
- **Coursework:** Control Theory, Robotics, Artificial Intelligence, Diagnostics and Sensors, Computer Architecture

Languages

Czech: Native speaker

English: Advanced

- FCE certificate (6/2016)
- Primary communication language in a multilingual team

Publications

Object Pose Estimation Using Implicit Representation For Transparent Objects — 9/2024

Varun Burde, Artem Moroz, ***Vít Zeman***, Pavel Burget

Conference: ECCV24 TRICKY workshop
DOI: TBD

Automatic Workspace Calibration Using Homography for Pick and Place — 8/2023

Varun Burde, David S. Martinez, ***Vít Zeman***, Lars Kahlert, Tomas Jochman, Pavel Burget

Conference: 2023 IEEE 19th International Conference on Automation Science and Engineering (CASE)
DOI: 10.1109/CASE56687.2023.10260601

Additional Experience And Awards

Second Place, Porsche Engineering Student Contest 2023: 11/2023

- Participated in a team-based hackathon challenge aimed at autonomously controlling a sports car on a racing track to achieve the best lap time
- In addition to co-presenting the final solution, my contribution involved implementing a computer vision algorithm to detect the track, which provided input data for planning and the PID regulator used for car control

Technologies

Languages: Python, C++, C, Julia, Matlab

Tools: Git, Anaconda/Mamba, SLURM, ROS, Docker

Hobbies

Technology: Following latest trends in technology, mostly about PCs and mobile devices.

Reading: Both scientific literature (papers, journals) and fiction (Mostly sci-fi and fantasy)

Sports: badminton, cycling, swimming, ...