Bachelor or Master Thesis

Simulation-based validation of computer vision in factory automation

Start: From now on

Your profile:
- Technical studies with relation to computer science
- Programming skills
- Motivation and commitment
- Interest in factory automation

What we offer:
- Collaboration in an exciting and cutting-edge field of research
- High industrial relevance
- Short-term processing
- Intensive mentoring and interdisciplinary exchange

Initial situation:
Reliable obstacle detection is essential for the automation of vehicles. Up to now, cost-intensive laser scanners have been used for this purpose. The use of inexpensive camera systems requires highly reliable image data processing. Classical object recognition approaches, which abstract object properties based on a training data set, have limited performance. Photorealistic simulations can be used to increase robustness and to validate functional reliability.

Your task:
The goal of the thesis is the testing of a game engine (Unreal Engine 4 or similar) for the validation of safety-critical image processing algorithms in automation technology. For this purpose, an obstacle detection system based on a mono camera is to be implemented.

Subsequently, a simulation shall be enabled to simulate an automated guided vehicle in the factory environment. The reliability of the obstacle detection should be proven within the simulation.

The following work packages are derived from the task definition:
- Research on the state of the art in the field of computer vision, focus on obstacle detection
- Research in the field of safety validation by photorealistic simulation
- Conception and implementation of a simulation framework
- Validation of image processing in simulation

Have we sparked your interest?

Please send a current excerpt of your grades as well as your curriculum vitae to the e-mail address below.

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