TUHH

Technische Universität Hamburg | W6 | 21079 Hamburg

Justin Ziegenbein
E-mail:justin.ziegenbein@tuhh.de

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Thesis/project work at the Institute of Technical Logistics

Title: Real-time Anonymization of Camera Data for Privacy-Preserving Robotics

(Master's / Project Thesis)

Within the field of mobile robotics, ensuring data privacy is paramount, particularly in robots navigating public spaces. This research endeavors to address this critical need through the development of automated real-time anonymization techniques for camera data. The objective is to enable subsequent processing for monitoring, detection, or segmentation purposes on a mobile computing unit while upholding stringent data privacy standards.
In today's landscape, the utilization of camera-equipped robots in public environments raises concerns regarding the privacy of individuals inadvertently captured in visual data streams. Hence, this study focuses on creating methodologies that safeguard personal privacy while facilitating the utilization of camera data for essential robotic functionalities.

Task description:

1. Research and familiarization with the scientific state of the art of the topic
2. Record Data using a setup consisting of
    - Stereolabs ZED2 (Stereo) Camera
    - Mobile computing unit as the target platform (Nvidia Jetson Xavier/Orin)
3. Research what kind of object need to be anonymized to fulfill the european Data Privacy Requirements
4. Select and practically evaluate various computer vision approaches for detecting objects that need to be anonymized using a GPU workstation with Ubuntu Linux
    - Faces, number plates etc.
5. Establish a way of deleting or blurring the detected objects and evaluate different approaches
6. Transfer the most promising solution to the mobile computing unit and evaluate real-time performance

Requirements:

- Prerequisite knowledge or willingness to independently familiarize yourself:
    - Computer Vision
    - Machine Learning
    - ROS
    - Linux

Institut für Technische Logistik
Theodor-Yorck-Straße 8 | 21079 Hamburg
justin.ziegenbein@tuhh.de
www.tuhh.de/itl

- Independent and meticulous way of working

Institut für Technische Logistik
Theodor-Yorck-Straße 8 | 21079 Hamburg
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www.tuhh.de/itl