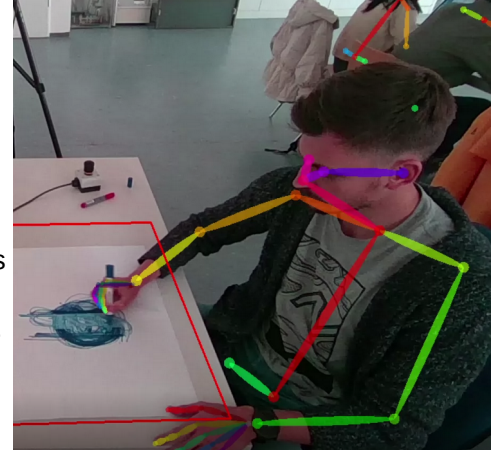


Human Shoulder-Arm Inverse Kinematics for Improved Markerless Human Body Tracking

Thesis Abstract

Learning from demonstration (LfD) is an approach in which robots are programmed, without any knowledge in robotics or programming, simply by demonstration of the task. We focus on using markerless 3D human body tracking (figure on the right) as the input to our system. Unfortunately, this system suffers from noise and occlusion (e.g. same depth for both shoulders for a sideview of the human). The task of the master's thesis is to model the human should-arm inverse kinematics and use this model in a Kalman-Filter to improve the human body tracking.



Task Description

- Literature Review on the following topics:
 - Human Should-Arm Inverse Kinematics
 - Kalman-Filter Design Approaches
 - Handling of error sources (delays, etc.)
- Selection of appropriate assembly task
- Getting familiar with the current perception framework
- Implementation of the task segmentation algorithm
- Implementation of the skill execution

Prerequisites

- Intermediate or advanced programming experience
 - Preferred in C++
- Experience with Kalman Filter Design
- Optional: Knowledge in computer vision
- Optional: Experience with the following libraries: openpose, librealSense

Application

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