
User Identification in an interactive room using Kinect

Keywords: Tracking; User identification; Depth camera; Computer Vision

Introduction

Computer supported collaborative work is an emerging area of research, thanks to ever-increasing availability of IT technologies. As in every collaborative scenario, we need to know who is doing what. In this thesis, you will answer this question by designing a user identification system using a Kinect for XBOX depth camera. The system will be installed in a collaborative room, not much different from the image on the right.



Content of the Thesis

Within this thesis, a user identification system should be developed using Kinect for XBOX ONE depth camera. By comparing anthropometric features of a user (such as height, shoulder width, ...), as well as other distinguishing factors (hair color, walking pattern, ...) , the system should be able to detect and identify a user in the presense of other users and objects, and assign him or her a unique, fixed ID, in spite of user's movement, occlusions and other existing dynamics. A simple demonstrator application should be developed to show the quality of the user identification.

Work Packages

- Studying the existing literature
- Determining features that can be measured using the Kinect for XBOX ONE, given its limitations
- Developing user identification algorithms
- Intermediate presentation
- Realizing a physical setup and a simple demonstrator application
- Evaluating the system by means of a user study
- Written final report and final presentation

Requirements

To be considered for this thesis, you should have

- Programming skills, preferably in C# or C++. We might also consider you if you have strong Python skills.
- Experience in Machine Learning or Computer Vision (OpenCV is a plus, but we also consider scikit-image and Matlab skills as valuable)
- Interest in performing user studies
- Strong communication and interpersonal skills

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