

Master Thesis

3D Skeleton Reconstruction from Omnidirectional Image

Description

In the project AUXILIA, our professorship is working on ways of classifying daily activities of a person. Previous research of our group has proven that the basic activities such as walking, standing, sitting and lying down can be recognized reliably from 3D skeletons. However, it is difficult to acquire accurate 3D skeletons from real image data, especially for our omnidirectional camera setup. Therefore a HAR method based on 2D skeletons is to be developed.

For this project, the following datasets are given:

- A synthetic dataset of omnidirectional images. The bounding boxes, keypoints in 2D and 3D coordinates and activities labels for persons are given. (Example: Figure 1).
- A real dataset. The bounding boxes of persons are given. (Example: Figure 2).

The student's work isn't limited to this work but should at least do the following steps:

- Train a ML model on the synthetic dataset to classify afore mentioned activites
- Annotate the real dataset with activies
- Expand the real dataset
- Evaluate the trained model on the real dataset

Recommended experience

- basic understanding in computer vision and machine learning
- knowledge in at least one programming language (preferably Python)

Literature

[1] S. Zhang, Z. Wei, J. Nie, L. Huang, S. Wang, and Z. Li, "A Review on Human Activity Recognition Using Vision-Based Method," *Journal of Healthcare Engineering*, Volume 2017.

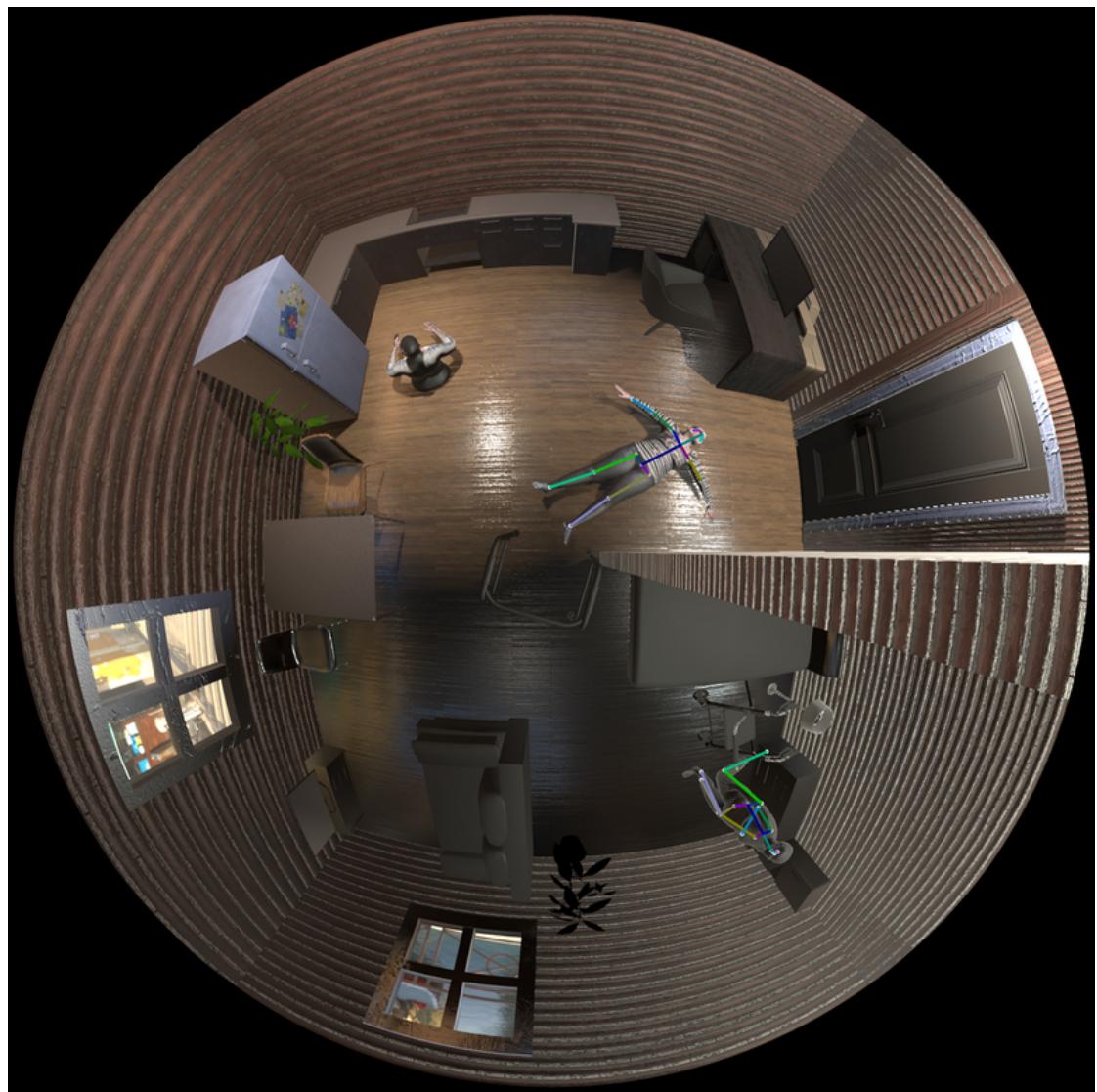


Figure 1: Record_00021



Figure 2: Record_00006