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# Bachelor Thesis / Master Thesis

## Comparison of manual, semi-automated, and automatic segmentation of human activity data

**Task:**

The segmentation is to split a relatively long sequence of activities into several segments of single activities, which are suitable for model training and offline recognition. Segmentation can be performed manually. In the segmentation of the data supplemented by video camera(s) recording the whole process, the acquired dataset will be segmented by dedicated persons relying on the video. Another approach of manual segmentation for biosignal-based HAR is data visualization. In our in-house CSL-SHARE dataset, a pushbutton was applied for a semi-automated segmentation and annotation solution, of which the applicability and correctness have been verified during numerous experiments. Besides, modern ML methods, like Gaussian Mixture Models (GMMs), Principal Component Analysis (PCA), Probabilistic Principal Component Analysis (PPCA), and DTW-based subsequence search are being used to segment human activity fully-automatically or semi-supervised.

Your task is to apply these methods to single-channel or even multi-channel data from various sensors (IMU, EMG, Goniometer, among others) and compare the segmentation results.

**Requirements:**

- Good programming skills in Python
- Ability to summarize the literature
- Basic knowledge of signals and machine learning

**When:**

- As soon as possible

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