

SA/MA: Who is Dancing? Recognize Dancers by Means of Motion Sensors

Dancing belongs to the most expressive and important forms of non-verbal communication when people socialize. Wikipedia writes: “Dance [...] is a sport and art form that generally refers to movement of the body, usually rhythmic and to music”. This definition suggests, that body-worn acceleration sensors should be able to detect if somebody is dancing to a given piece of music. We believe that future entertainment systems could greatly profit from such information. Imagine a dancefloor in a disco. If such a system recognizes that only few people are dancing, it might be able to automatically change the style of music in an attempt to motivate more people to dance, resulting in a better overall mood of the crowd.



In this thesis, your task is to develop methods to identify dancing people. In particular, the goal is to distinguish dancers from non-dancers within a group of people by means of body-worn acceleration sensors. In a first part you will have to set up an experiment to gather data in a realistic scenario. Crucial aspects include defining a suitable yet realistic scenario and script, deciding about optimal sensor placement to retrieve good sensory data, and investigate how the behavior of non-dancers differs from the behavior of dancers in a real world environment.

In a second part you will have to analyze the gathered data. The goal is to come up with classification algorithms able to reliably detect dancers in the experiment. Thereby, considering audio features of the played track and comparing them with the acceleration signal might significantly increase the detection rate. Additionally, comparing data among multiple people could lead to a better understanding of the scene. Finally, you have to evaluate your algorithms: How accurately are you able to distinguish dancers from non-dancers?

This project requires some interest in and knowledge about digital signal processing and machine learning.

Interested? Please contact us for further details!

Requirements: Basic knowledge about digital signal processing and/or machine learning of advantage.

Contact:

1. Kuhn Michael: kuhnmi@tik.ee.ethz.ch, ETZ G61.4, phone 044 632 77 30
2. Martin Wirz: martin.wirz@ife.ee.ethz.ch, ETZ H 97, phone 044 632 58 29
3. Roger Wattenhofer: wattenhofer@tik.ee.ethz.ch, ETZ G63, phone 044 632 63 12