Recognising user actions during cooking task (Cooking task dataset) – IMU Data

Documentation

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1 General information

Experiment title	Recognising user actions during cooking task
Experiment id	D2011-KTA-KHY
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Type	Measurement
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Keywords	activity recognition, kitchen task assessment, cooking task
Language	English
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1.1 Objective

Recognise the actions of a user and the manipulated objects while executing kitchen tasks.

1.2 Problem Statement

One person is preparing a meal in the kitchen that includes: preparing the ingredients for a soup; cooking the soup; serving the soup; having meal; cleaning the table; washing the dishes. The task is to recognise the fine-grained actions that constitute these tasks and the objects in the environment which the person is manipulating.

2 Description

The dataset contains the data of acceleration sensors attached to a person during the execution of a kitchen task. It consists of 7 datasets that describe the execution of preparing and having a meal: preparing the ingredients, cooking, serving the meal, having a meal, cleaning the table, and washing the dishes. Each of these datasets consists of the raw acceleration and angular rates that were recorded with motion capturing system based on wearable inertial measurement units (IMUs). The aim of the experiment is to investigate the ability of activity recognition approaches to recognise fine-grained user activities based on acceleration data. The results from the dataset can be found in the PlosOne paper "Computational State Space Models for Activity and Intention Recognition. A Feasibility Study" by Krüger et al. [1]. Other publications related to the dataset are [3, 2, 4, 5].

2.1 Data format

The `001-IMU/` folder contains 7 data files, one for each recording. The sensor data was recorded with motion capturing system based on wearable inertial measurement units (IMUs). Each data file contains the raw acceleration and angular rates recorded as well as the corresponding annotation.

The annotations are described in the form *action-object-fromLocation-toLocation*:

16 action classes wash, wait, move, take, put, cut, fill, turn_on, cook, turn_off, open, close, sit_down, eat, drink, stand_up;

4 locations sink, moving, counter, table;

6 fixed places sink, moving, counter, table, stove, cupboard;

11 objects hands, carrot, knife, cutting_board, pot, wooden_spoon, plate, glass, bottle, spoon, sponge;

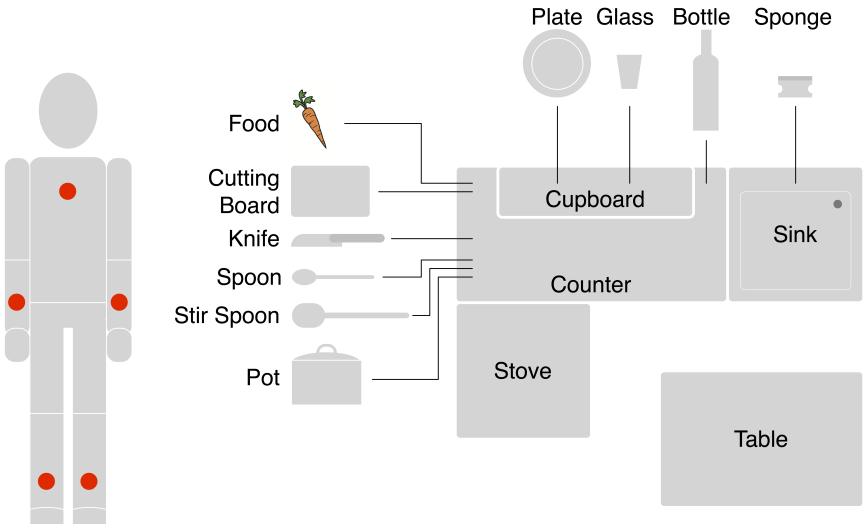

Figure 1: Positions of the sensors on the body (with red). Layout and objects in the experiment.

2.2 Dataset recording

The sensor data was recorded with motion capturing system based on wearable IMUs. For each sensor three axis acceleration and angular rates were recorded, with a sampling rate of 120 Hz. The experiment layout and the sensors locations are shown in Figure 1. Seven voluntary subjects acted according to a script to generate the observation data for the datasets.

References

[1] Frank Krüger, Martin Nyolt, Kristina Yordanova, Albert Hein, and Thomas Kirste. Computational state space models for activity and intention recognition. a feasibility study. *PLoS ONE*, 9(11):e109381, 11 2014. URL: `http://dx.doi.org/10.1371%2Fjournal.pone.0109381`, `doi:10.1371/journal.pone.0109381`.

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