Supplementary Material: Using a Minimal Action Grammar for Activity Understanding in the Real World

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Abstract

This document provides the supplementary material and links for our IROS 2012 paper submission number 90.

1   Details of the Kinect+SR4000 Complex Activity Dataset

We describe the detailed instructions given to the actor for each type of video sequence during the dataset collection.

1. Making a Sandwich: The actors were given a whole bagel, a knife, and various ingredients and told to make a sandwich.

2. Cooking Vegetables: The actors were given several vegetables (apples, cucumber, carrots, tomatoes) and were asked to chop the vegetables and place them onto a plate.

3. Sewing a felt toy: The actors were given a pattern, felt, scissors, needles and thread. The pattern was to be cut out, pinned to the felt, and the felt pieces cut out and then sewn together.

4. Making a Valentine card: The actors were given two sheets of construction paper, a glue stick, and a marker. They were to cut out a heart from each sheet of paper, glue them together, and write a message on the card.

5. Assemble a machine: The actors were given two Meccano Erector Set pieces, two nuts and two bolts, and asked to assemble them.

The actors also performed the machine assembly and Valentine tasks simultaneously, interleaving the parts of the tasks as they chose. These activities are more complex and less structured than typical action recognition experiments. Instructions were purposely informal, to encourage natural variability in how the tasks were performed. Please go to:
    http://www.umiacs.umd.edu/research/POETICON/umd_complex_activities/
to download samples of the dataset, and see sample videos of even more results.

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2 List of all 16 sequences in the Complex Activity Dataset

The table below lists the filenames for all 16 sequences, the activity that was performed based on the description above and the actors that performed it. The 4 Sequences marked with "*" are excluded from the second experiment as explained in the main paper.

File Name	Activity Class/Name	Actor ID	Remarks
14_25_02	Kitchen: Cutting Apples	1	Only an apple is cut.
14_22_09	Kitchen: Cooking Vegetables	1	All vegetables were used except an apple.
13_49_12	Kitchen: Making a Sandwich	2	
14_27_24	Kitchen: Cooking Vegetables	2	
14_32_18	Kitchen: Cooking Vegetables	3	All vegetables were used except an apple.
14_19_22	Kitchen: Cutting Apples	4	Only an apple is cut.
13_58_47	Kitchen: Making a Sandwich	4	
14_05_10	Kitchen: Cooking Vegetables	4	All vegetables were used except an apple.
13_06_20(*)	Crafts: Assemble a Machine	2	
13_11_15	Crafts: Assemble a Machine + Making Valentine Card	2	Interleaved activity.
13_02_30	Crafts: Making Valentine Card	2	
12_51_42(*)	Crafts: Sewing a felt toy	2	
13_28_47(*)	Crafts: Assemble a Machine	4	
13_32_10	Crafts: Assemble a Machine + Making Valentine Card	4	Interleaved activity.
13_23_31	Crafts: Making Valentine Card	4	
13_17_48(*)	Crafts: Sewing a felt toy	4	

Table 1: List of manipulation activities considered.