


ANNEX A – Master Thesis Proposal

1. Student Information

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Date and Signature

16/02/2009


2. Master Thesis Information (use as many pages as needed)

Title:

Hands and Head Tracking using Joint Probabilistic Data Association Filter

Description:

The visual analysis and recognition of human manipulation actions is of interest for e.g. human-robot interaction applications where a robot learns how to perform a task by watching a human. Recognition of human manipulation actions can be done by analysing *shape of the hand* and *position of hands relative to the face*. For both shape and hands to head position estimation it is necessary to know where head and hands are; hence, tracking algorithms should be involved in this process. Considering that several targets should be tracked simultaneously, advanced algorithms that can deal with multiple trackers should be used, e.g. a joint probabilistic data association filter (JPDAF). Performance of the system for recognition of human actions can be increased using analysis of human manipulation actions in 3D.



Aims:

To track the hands and head of the person manipulating different objects and to estimate hands to head position.

Tasks:

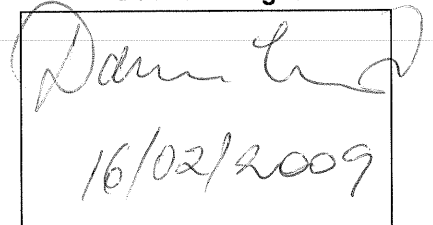
- Taking sequences of images with person grasping and manipulating different objects.
- Images analysis and segmentation of hands and head.
- Hands and head tracking in 2D using JPDAF.
- Hands and head tracking in 3D.

Planning:

1. 16 Jan – 16 Mar: Literature review and analysis of tracking algorithms.
2. 16 Feb – 16 May: Report preparation.
3. 16 Feb – 15 Mar: 2D tracking hands and head using sequences of images, testing.
4. 15 Mar – 15 Apr: 3D tracking using sequences of images from 2 calibrated cameras, testing.
5. 15 Apr – 14 May: Integration of tracking with human activity recognition system.
6. 15 May – 1 Jun: Final review, research paper preparation.
7. 1 Jun – 15 Jun: Preparation for presentation.

3. Supervisor Information

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Date and Signature

Danica Kragic
16/02/2009