

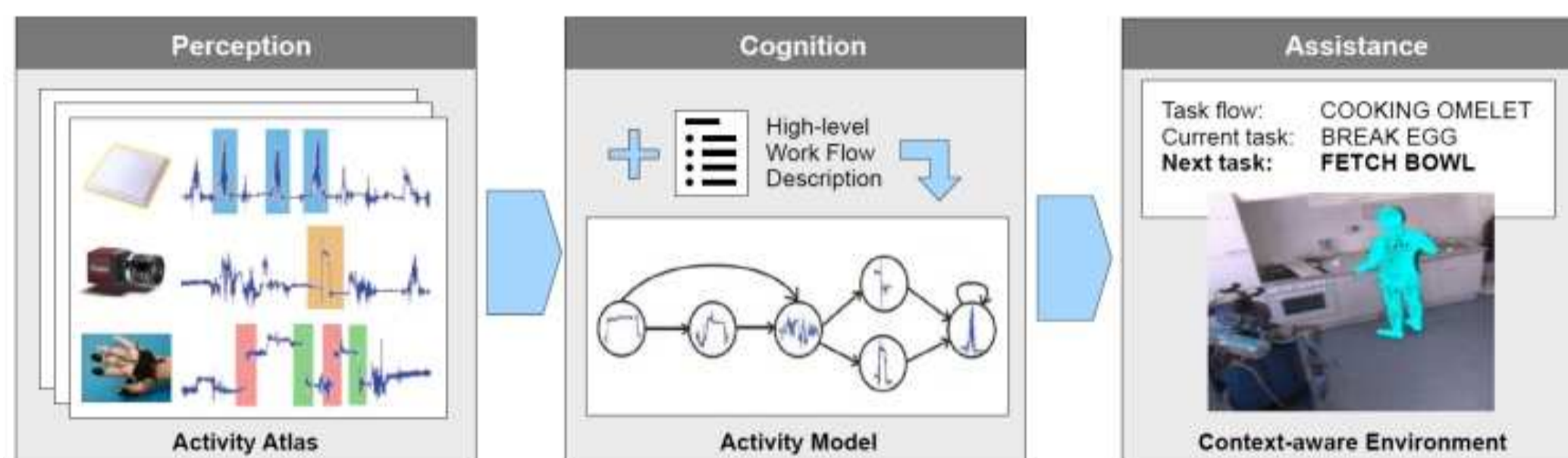
4D Feature Tracking using a Multiple-Camera System



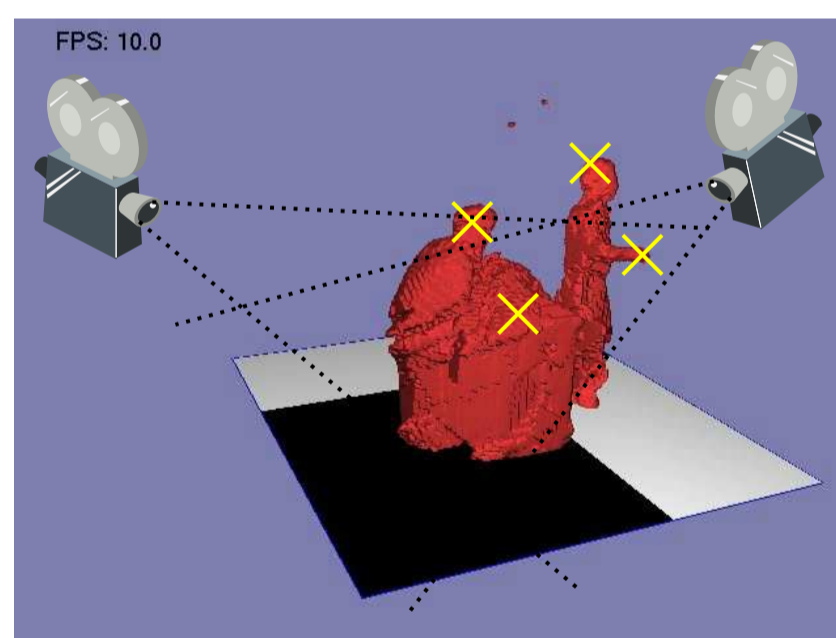
Student assistant for programming (HiWi) wanted!

Description of the Project

This project aims at the understanding, modeling and recognizing daily life human actions. Among all the activities a human can perform, there are often specific indoor activities which repeat in a daily routine, such as preparing meals, cooking or setting the table. Our objective in this project is to learn a statistical model (Graphical Model) of such Task-flow (repetitive sequence of actions) and to use the model for recognizing the steps in the task-flow. The model should be able to generalize over a large range of possible variations due for example to different subjects' skills, expertise, style, etc. Such activity recognition systems have numerous applications, e.g. human-machine interaction, assistance, task-flow efficiency analysis.



This is a joint project between the Chairs of **Prof. Dr. Nassir Navab** and **Prof Dr.-Ing. Darius Burschka**, part of the CoTeSys cluster of Excellence. In this particular HiWi job, the student will first integrate and implement feature detectors into the existing multi-camera framework. He will then filter and fuse the resulting features in order to robustly track them inside the reconstructed 3D volume. The outcome will be used as input to an existing taskflow recognition system.



Description of the student assistant's job:

- Integrate and implement feature-extraction methods such as SIFT and SURF into the multi-view framework.
- Filter and fuse the features using the geometric information provided by the camera calibration.
- Robustly track the features using a Kalman filter.

Start: Immediately.

Prerequisites:

Good Matlab and C/C++ knowledge. Some experience in image processing, computer vision and/or machine learning would be preferable.

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