User-Adaptive Deskwork Support System
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In our daily lives, people typically spend significant amount of time at their desks. Therefore, supporting individuals who work at desks by using an intelligent robotic system could have a great deal of benefit. Because various tasks are done at a desk, many objects are used there. Therefore, we have to pick out necessary objects and put away unnecessary objects properly. This could be a waste of time and energy. To reduce these wasteful tasks, we propose the system that carries necessary objects when the objects are needed.

Concretely, the system hands over a necessary object as soon as a user attempts to reach out for it (Fig. 1). In order to realize such support, the system has to (1) detect user's prehension movements, (2) predict the target object, and (3) carry the object to the user. We have realized the first two by integrating information of user's hand and eye movements.

In this study, we also propose the system that estimates the necessary object based on user's pointing gestures. Here, the system estimates the user's subjective pointing direction based on a linear model using the user's finger direction. And, the system integrates sensory information obtained from the user's pointing gestures and contextual information as the user's action sequences to estimate the target object with a high degree of accuracy (Fig. 2).

Keywords: deskwork, prehension, gaze, pointing gesture

References
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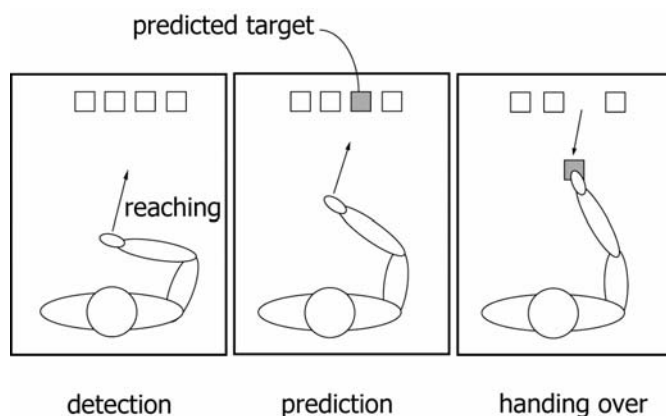

Fig.1 Handing-over between human and
a self-moving tray

Fig.2 Target estimation based on
pointing gestures