

Attentive Workbench: An Intelligent Production Cell Supporting Human Workers

(Dr. M. Sugi, Prof. J. Ota and Prof. T. Arai)

In recent years, consumer trends changes dynamically. Manufacturers are required to maintain variety in their product lineups. For this reason, automated manufacturing lines are being gradually replaced to “cell production system,” in which a single human worker assembles each product from start to finish almost manually. Using multiple skilled human workers, the cell production system can accommodate diversified products and production quantity more flexibly than automated manufacturing lines.

On the other hand, with negative and zero growth of the population and the tendency of young people avoiding manufacturing jobs, we will face a shortage of skilled workers, and hence a great difficulty in maintaining the cell production system.

To meet diverse needs with fewer labor forces, we propose attentive workbench (AWB), together with Profs. Takamasu, Yamamoto, Kimura in the Dept. of Precision Engineering, Prof. Suzuki in Research Center of Advanced Science and Technology, Prof. Sato in Institute of Industrial Science, Prof. Shin in Dept. of Mathematical Engineering and Information Physics.

AWB is an intelligent cell production system. It consists mainly of an augmented desk interface, self-moving trays, and vital signs monitors. The system recognizes the intention and the condition of a human worker, and presents the information and supplies assembling parts to the worker. This may result in a higher yield rate and productivity, by reducing the failure and the time at the picking up of the parts.

The present system is going to be implemented and tested. Applying AWB to deskwork is another research topic for us. We have proposed a new method for estimating the intention of human workers by integrating both the sensor data from pointing gestures and the action sequence of the workers.

Acknowledgements This research is partly supported by the 21st century COE program “Information Science and Technology Strategic Core” from the Ministry of Education, Culture, Sports, Science and Technology, Japan.

Keywords: Cell Production System, Attentive Workbench (AWB), Augmented Reality

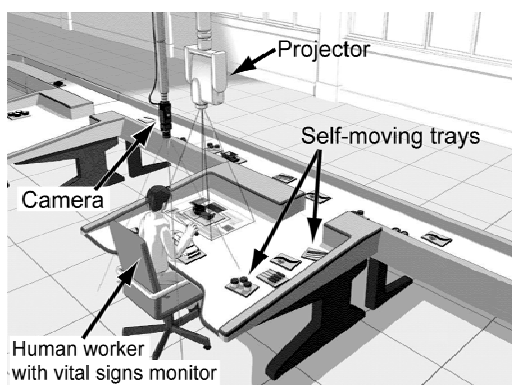


Fig. 1 Overview of Attentive Workbench

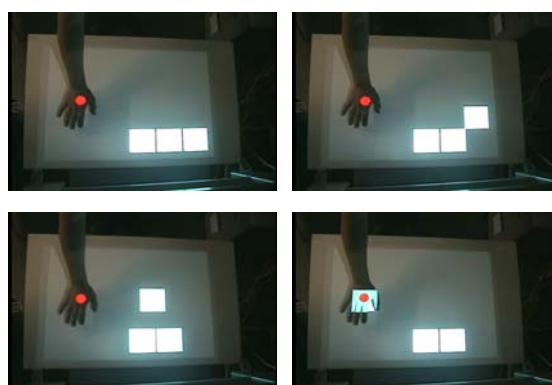


Fig. 2 Demonstration of Attentive Workbench with Virtual Self-Moving Trays