YAMAKAWA LAB.

[High-speed Robot Beyond Human]

Department of Mechanical and Biofunctional Systems

High-speed Flexible Robotics

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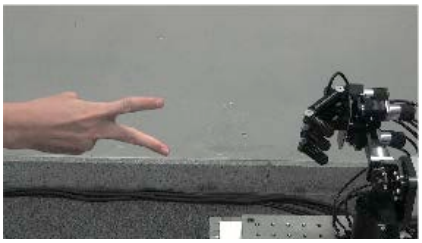
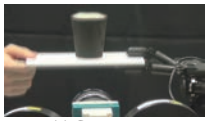
High-speed Robot System

Our laboratory has been developing high-speed robot system including high-speed vision, high-speed image processing, sensor network and sensory feedback. For example, we developed a high-speed robot hand which can perform speed of 180° / 0.1s.

High-speed Robot Hand

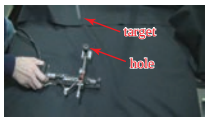


Janken Robot



(a) Cooperation

(b) Assistance

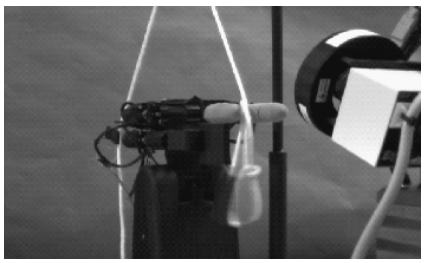


(c) Enhancement

Human-robot Interaction

Human-Robot Interaction

By using a high-speed vision and a high-speed robot hand, we have constructed super low-latency and real-time human-robot interaction system. As concrete tasks, we have achieved Janken (rock-paper-scissors) robot with 100% winning rate, human-robot cooperation, assistance system and enhancement of human motion.



One-handed Knotting

Flexible Object Manipulation

We focus on flexible object manipulation which is considered to be difficult to perform robots, and we aim to achieve dynamic and high-speed manipulation of flexible objects. In the previous researches, we achieved one-handed knotting of a flexible rope and dynamic folding of a cloth using a high-speed robot hand system.

Dynamic Folding