

## Applications of Vision Chip

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### 【Outline of survey】

High-speed vision chip technology with recognition capability has been developed. The vision chip technology can realize real time image processing at 1kHz frame rate and open a new research field of high speed image processing. As an application of the technology, innovative robot systems based on high-speed visual feedback have been already developed.

As a purpose of this research project, vision chip and high-speed image processing technology will apply to different application fields. There are many application fields of vision chip technology such as high-speed visual inspection in industry, intelligent transportation system, target control of image and media, and so on. In this project, 1) high-speed visual interface which can recognize human behavior by using vision chips, in particular, a quantum leap in high-speed and real-time interactive human interface, 2) high-speed micro visual feedback control and recognition of micro-targets in images of microscope for bio and medical applications, in particular, a quantum leap in speed of three-dimensional target tracking and recognition, will be pursued. With the aim of implementing some innovative systems by using vision chips, the vision chip technology will contribute in related application fields.

### 【Expected results】

Innovative human interface systems for high-speed and informative recognition from human behavior and facial expression will be realized by using high-speed visual interface. In addition, recognition systems for understanding of intention and affection of human operators will be realized. It is an important technology for realizing affordable interface in wearable computer, game machine, home electrical appliance and so on.

By research of high-speed micro visual feedback, a quantum leap of observability and controllability of microscope images will be realized. Not only automatic operation of micro target such as microorganism and cell but also control of vibration derived from human operation in microscope surgery will be realized. New fundamental technology in medical and bio industry will be developed.

### 【References by the principal investigator】

- Masatoshi Ishikawa, Takashi Komuro, Akio Namiki, and Idaku Ishii : 1ms Sensory-Motor Fusion System, Robotics Research (J.M.Hollerbach and D.E.Koditschek eds.), pp.359-364, Springer (2000)
- Masatoshi Ishikawa : Description and Applications of a CMOS Digital Vision Chip Using General Purpose Processing Elements, Smart Imaging Systems (Bahram Javidi ed.), pp.91-109, SPIE PRESS, (2001)

【Term of project】 FY2007—2011

【Budget allocation】 10,600,000 yen  
(2007 direct cost)

【Homepage address】

<http://www.k2.t.u-tokyo.ac.jp/>