

A New Creation in Education with "Self-Cultivation Seminars"



The students are to submit their comments, the hidden treasures of their thoughts, which lead, as great hints and keys, to successful class planning. Students write down many comments about their thoughts and impressions.

It is not Professor Mizuhara who stands at the podium, but some graduate school students; they are TA's (teaching assistants), who start the "pedagogy" class. TA's discuss with their professor how they should deliver their class lectures, usually a day before the class, and then make a detailed scenario by which they will proceed with their lessons. They develop the contents of their next lecture based upon comments submitted at the end of the classes by the undergraduate students. This system is based upon Professor Mizuhara's idea that "nowhere in education can exist on one-way communication just from the teaching side. It is important to create a situation for communication, where teacher and students can carry on active discussions with one another, face to face." His theories are implemented in the "Self-Cultivation Seminars."

The university's own liberal education curriculum is presently a priority on the reform list in the "Tohoku University Action Plan 2007," with the results of Professor Mizuhara's studies being applied to it.

【Sciences of Teaching and Learning】

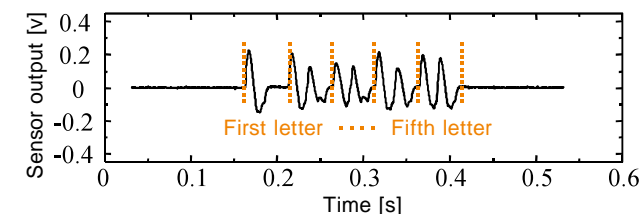
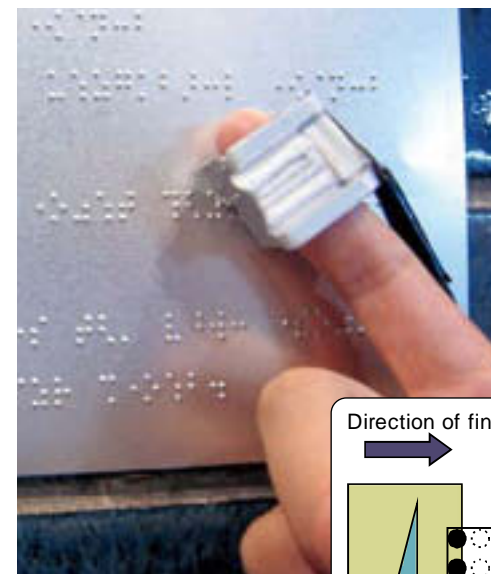
Professor Katsutoshi Mizuhara

Born in 1949, he completed his master's course in the Graduate School of Education at Tohoku University then studied in China at the Beijing Normal University. He acquired his Ph.D in 1989 and assumed the position of professor at the Faculty of Education at Tohoku University in 1994.

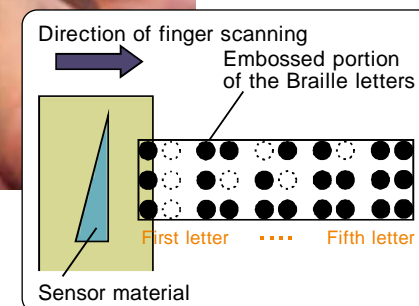


Professor Katsutoshi Mizuhara, Graduate School of Education <http://www1.sed.tohoku.ac.jp/mizuhara/>

Creating a New Direction in the Future of Robotics at the Advanced Level of Human Haptic Sensation



The aim is to develop a sensor system for reading Braille which is made up from a simple sensor material. The system should be of a wearable finger-attachment type, allowing it to be used like a human finger.



Aims are to develop a haptic sensor which attaches to the finger tips and is able to read, by a simple stroking, lines of Braille. The basic material contains sensor cells, each made with different lengths of contact time. Therefore, it is possible to obtain different output waveforms, producing patterns for differentiating and recognizing Braille letters.



We, as humans, have the ability to reason and to understand the fuzzy areas of things. As an example, when they hear the phrase "smooth touch," people think of the same sensation, with a subtle difference in understanding from person to person. Associate Professor Mami Tanaka, as a researcher, has been approaching these abstracts and the fuzzy areas by means of mechatronics. In an attempt to develop new types of sensors and actuators which will allow further advancements of human-robot synergistic activities, she conducts studies in micro-macro mechatronics with measurements and automatic controls.

One accomplishment is rating and evaluation of human haptic sensation to elucidate the "touch sensation" through engineering and by applying the functions of the Pacinian corpuscles, which are mechanoreceptors in the human skin.

A robot finger system for the hand is now under development, which will collect and handle information on various types of touch-sensations. These developments in biorobotics can also be applied in medical palpation or in the various areas of industrial robots.



【Biorobotics】

Associate Professor Mami Tanaka

Associate Professor Tanaka completed her master's degree in the Graduate School of Engineering then assumed the position as an associate professor in 2001, at the Tohoku University in the Graduate School of Engineering.

Associate Professor Mami Tanaka, Graduate School of Engineering <http://rose.mech.tohoku.ac.jp/index.htm>