

Press Release

Development of a Personal Robot with a Sense of Taste

--Utilizing Infrared Spectroscopic Technology, Robotic Technology, and Pattern Recognition Technology ---

June 9, 2005—NEC System Technologies, Ltd. announced today that it has succeeded in developing a robot with a sense of taste. Using its sensor, the robot is capable of examining the taste of food and giving the name of the food as well as its ingredients. Furthermore, it can give advice on the food and on health issues based on the information gathered. The robot is called “Health and Food Advice Robot,” the world’s first partner

robot with a sense of taste. NEC System Technologies and Laboratory of Bioinformation & Food Engineering (BIFE), Faculty of Bioresources, Mie University worked together. This technology was proposed to the “21st Century Robot Challenge Program: Next Generation Robot: Practical Application Project (Prototype Development Support Business)” led by the New Energy and Industrial Development Organization



(NEDO), and was adopted. The achievement was made possible by combining NEC System Technologies’ robot technology and pattern recognition technology with the analytical techniques of the infrared spectroscopic technology of the BIFE Laboratory.

The “Health and Food Advice Robot” features the following:

1. **Gives health and food advice by instantly analyzing fat and sugar contents of a food**

A food constitutes many different molecules such as water, fat, sugar, and protein, and each molecule absorbs a particular wavelength of the infrared rays. Taking advantage of this property, the robot identifies which and how many molecules are contained in a certain food. It transmits infrared rays at the food, and then notes the wavelengths that are absorbed, thereby identifying the food and contents. Based on such data, it can determine if the food contains too much fat or sugar or if a fruit is ripe enough and thus give advice on health and food.

2. **Determines the name of a food product (brand and type) when shown a food**

When a food is irradiated with different lengths of infrared rays, a graph shows

absorption spectrum, which is different for each food. The robot can register absorption spectral features of different foods, and can conduct pattern recognition by comparing the wave form of a given food obtained by irradiating infrared rays to the stored information for different types of food, for example, it can determine a brand of cheese, or a type of bread.

The five human senses are now at the focus of attention, in the effort to develop robots that are close to humans. While “vision,” “auditory” and “tactual” senses have been explored from the early days of the technological development of physical sensors, “the sense of taste” and “the sense of smell” have been relatively slow to be developed in research and development, and there has never been a robot equipped with such senses. Considering today’s health boom and nursing care at home in this aging society, NEC System Technologies and Mie University decided to address research and development of a partner robot with the five senses. As a partner robot with a sense of taste especially, this “Health and Food Advice Robot” is the first one in the world.

NEC System Technologies and Mie University will exhibit this “Health and Food Advice Robot” in the “Prototype Robot Exhibition” which is one of the events hosted by NEDO from June 9 to 19 in the EXPO 2005, Aichi Japan.



A built-in infrared sensor on the robot arm.