

Project Period: FY2013~FY2021

http://coikansei.hiroshima-u.ac.jp/

Center of KANSEI Innovation Nurturing Mental Welfare

A society with happiness where “objects” and “minds” are in harmony and mental welfare is nurtured



**Project Leader
Takahide Nouzawa**

Chief Engineer, Technical Research Institute, Mazda Motor Corporation. 1980 - 2015: Head of the Technical Research Institute of the said corporation.



**Research Leader
Shigeto Yamawaki**

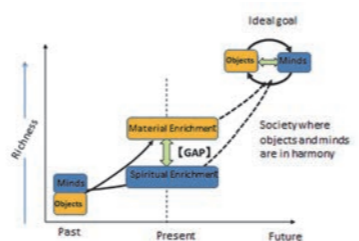
MD, Ph.D Distinguished Prof., Hiroshima Univ. 1979: Graduate from Hiroshima Univ. School of Medicine. 1990: Prof. of Psychiatry & Neuroscience, School of Medicine, Hiroshima Univ. 2017: Distinguished Prof., Hiroshima Univ. Major in Psychiatry, Neuroscience of Depression and KANSEI

The Future



Outline

At the Center of KANSEI Innovation, we develop BEIs (Brain Emotion Interfaces) that enriches inter-human and object-human relations connected by KANSEI with a combination of state-of-the-art brain sciences, optical technology, and information communication technology. Our mission is to exploit products and services in various fields such as clothing, food, housing, vehicles, household electrics, education, and medical care that nurture its mental values as their usage. Leading to innovation in the inter-human and object-human relations, we aim to create a society full of happiness where “objects” are in harmony with our “minds”.



Application & Service

- **Wearable and real-time KANSEI meters based on brain science**
 - Facilitates “heartful” life and society with our meter (sensing devices) that can comfortably read out our KANSEI in daily life.
- **Products and services accurately reflect users’ trait and instantaneously responds to KANSEI information in real time**
 - Nurtures their own values with attachment just like a lifelong partner.
 - Provides KANSEI communication services to allow your feelings to be passed to your family members and acquaintances at a distance.

Implementation Structure

Project Leader : Takahide Nouzawa (Mazda Motor Corporation)

Research Leader : Shigeto Yamawaki (Hiroshima University)

[Central organization] Hiroshima University

[Participating organizations] National Institute of Advanced Industrial Science and Technology, Hiroshima City University, Andersen Group, Kobelco Construction Machinery Co., Ltd., Sapporo Holdings, TOPPAN PRINTING Co., Ltd., HIROSHIMA GAS Co., Ltd, TOTO Ltd., Mazda Motor Corporation, Mitsubishi Chemical Corporation, and Mitsui Chemicals, Inc.

■ **Satellite institution : National Institute for Physiological Sciences**

Satellite Project Leader: Ippei Hagiwara

(NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, INC.)

Satellite Research Leader: Keiji Imoto

(National Institute for Physiological Sciences)

[Participating organizations] National Institute of Natural Sciences, NIPS, Yokohama National University, Kyoto University, NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc., NTT DATA Corporation, Oki Electric Industry Co. Ltd., Takenaka Corporation, and Tokai Optical Co., Ltd.

■ **Satellite institution : Innovative Photonics Evolution Research Center**

Satellite Project Leader: Tsutomu Hara

(Hamamatsu Photonics K. K.)

Satellite Research Leader: Shoji Kawahito

(Shizuoka University)

[Participating organizations] Shizuoka University, Hamamatsu University School of Medicine, The Graduate School for the Creation of New Photonics Industries, Hamamatsu Photonics K. K., Pulstec Industrial Co., Ltd., Brookman Technology, Inc., Honda Electronics Co., Ltd., and Yamaha Motor Co., Ltd.

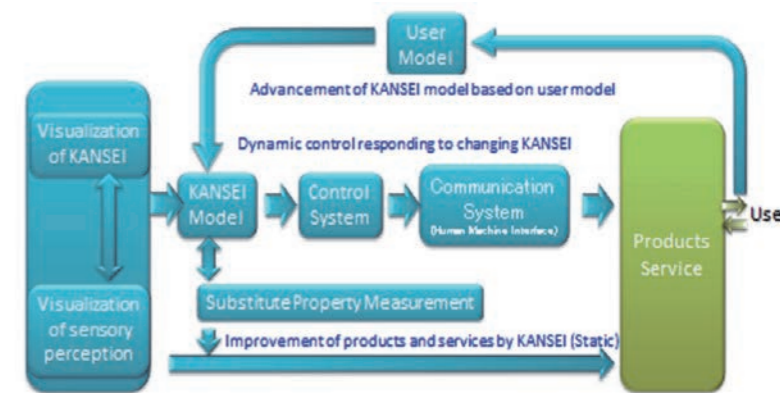
Key R&D Themes

Definition of KANSEI

We define KANSEI as a state of higher brain functions that monitor and predict affective responses evoked by comparing the exteroceptive and interoceptive sensory information by referring to ones past experiences and memories at a higher level.

R&D Themes

It is essential to exploit research in visualization of KANSEI for the social implementation of BEIs as well as develop various technologies including visualization of perception, alternative measures, mathematical models, controlling systems, human machine interfaces, and user models. These technologies need to be developed collaboratively, but not independently. To accomplish this, we have formed sub-committee groups where researchers of related themes work together for the social implementation.

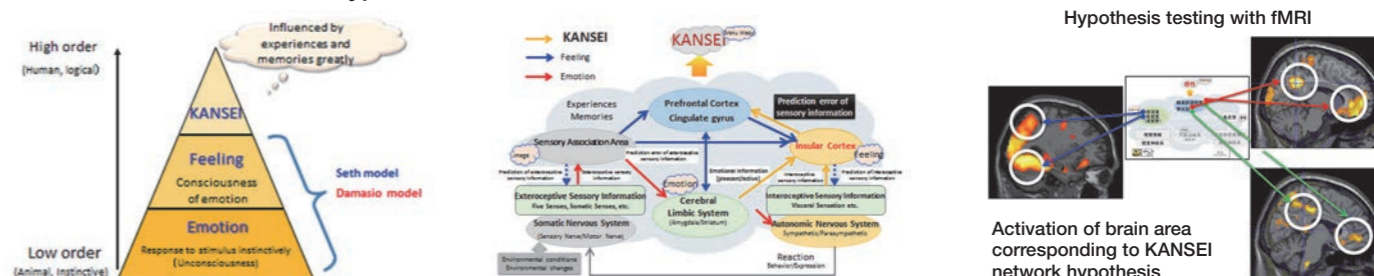


Major R & D Examples

1. Visualization of KANSEI Hiroshima University & Mazda Motor Corporation

Based on a model of emotion (Seth, *Trends Cogn. Sci.*, 2013), KANSEI brain network is hypothesized as a higher order network over the emotional and feeling networks. We develop the KANSEI visualization technologies through examining the hypothesis by experimentations with MRIs or EEGs. Built prototypes of BEI, we purposefully advance social implementation of our research outcome.

Hypothesis for KANSEI brain network based on Seth's model



2. Sensory perception visualization NIPS, Mazda Motor Corporation etc.

We aim to visualize sensory information by examining brain mechanisms of five perceptual senses. Furthermore, such sensory perception visualization technology is to be applied to various products and services by investigating the relationship between sensory perception and KANSEI as well as by building models for the technology of senses visualization.

Application of 'saliency map' to evaluate visual attention at the windshield



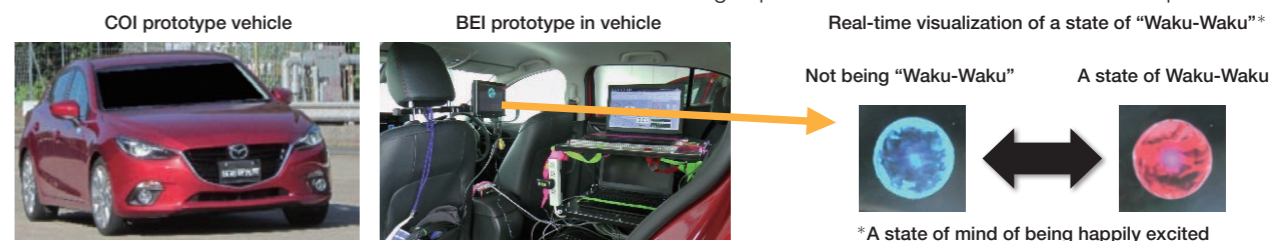
3. Substitute property measurement Shizuoka University, Brookman Technology, Inc., etc.

We aim to develop a camera sensing device such as a high-sensitive, wide and dynamic range image sensor to measure alternative features associated with KANSEI such as capturing facial expressions even under drastic environmental changes where luminosity changes from daylight brightness to nighttime darkness.

Topics

Example of social implementation

We built a COI prototype vehicle by utilizing our study outcome. Evaluating the prototype vehicle, to-be-solved issues for its social implementation have been identified and shared across each research theme group to accelerate R&D toward the social implementation.



INQUIRY
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