

## 1 TUTORIAL/WORKSHOP TITLE

Toward Comfortable Texture Design

### General Information:

Please insert any URL link to workshop/tutorial if available

We will prepare a website for the workshop, where introduction, program, and procedure for hands-on demonstration will be described.

### Type of Activity:

Please select:

- Panel Workshop<sup>1</sup>  
 Open Workshop<sup>2</sup>  
 Tutorial<sup>3</sup>

### Proposed Duration:

Please select:

- Half day  
 Full day

### Preferred time:

Please select:

- Morning  
 Afternoon

## 2 ABSTRACT

**Objectives:** This workshop will discuss and design comfortable textures. It is composed of lectures, discussion, and a hands-on experience program of making various textures. Through this workshop, we expect that the participants will be interested in comfortable textures, understand the applicability and potentiality of comfortable textures, and have an idea for basic researches of comfort perception and applications into industrial products.

**Significance and Impact:** In World Haptics Conference 2013, we successfully conducted a workshop on tactile feeling evaluations (see Fig.1). The present workshop focuses on comfort of textures. Comfortable textures add high value to products by adding human-friendly and/or luxury feelings. But there are many issues to design comfortable textures: how comfortable textures can be designed, whether there is a common physical factor among comfortable textures, etc.

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<sup>1</sup> The organizer proposes a topic, panel of speakers who have agreed to participate, a schedule and description

<sup>2</sup> The organizer proposes a topic, which (after approval) is disseminated openly; interested speakers apply to the organizer to participate. This style of workshop is ideal for exploring the degree of interest and activity in a new area.

<sup>3</sup> Tutorials are self-contained seminars of established research areas that should provide training within and perhaps on periphery of traditional haptic related topics They should be focused on the proposed topic and should be presented by two or three experts in the field.

**Content:** This workshop will have mainly two sessions. One provides a chance to discuss about comfort in aspects of a common factor, applications, etc. Here, participants will be asked to bring their favorite comfortable materials and to introduce a brief explanation of feelings and reasons why they are selected. The other provides a chance to have an idea for comfort design. We will prepare texture making kits for participants. Participants will enjoy creating their own texture by pressing papers for plastic molds with beads, wires, etc. arranged on (see Fig.2 and 3). The paper's friction and fine texture can be manipulated using plastic powder, or papers with various fine textures can be used as papers for molding. Thus, macro and fine textures can be created. Macro and fine textures have a possibility of giving various tactile feelings. Bump illusion based on friction [1] and “fishbone tactile illusion” [2] are representative examples. In automotive interior, “soft feel grain” [3] of Nissan motor company is a successful technology that gives a plastic surface a soft feeling like leather only by configuring geometric dimples on the plastic surface (Y. Tanaka, one of organizers, joined to the project of “soft feel grain”). We hope that participants create various feelings. Then, participants will give a short explanation about their resultant textures. After the presentation, participants will vote for a favorite comfortable texture with each other. Discussion will be opened on the basis of the results.



Fig.1 Workshop on WHC2013. Very crowded and popular!



Fig.2 Handmade creation of own texture. A similar workshop was domestically testified.



Fig.3 Texture making kit and procedure to use it

[1] G. Robles-De La-Torre and V. Hayward, Force can overcome object geometry in the perception of shape through active touch. *Nature*, 412, pp. 445-448, 2001.

[2] M. Nakatani, RD. Howe, and S. Tachi, Surface texture can bias tactile form perception. *Exp Brain Res*. 208(1), pp.151-6, 2011.

[3] <http://www.nissan-global.com/EN/QUALITY/STORY/MAGICTRICKS/>

### 3 AUDIENCE

The workshop will be of general interest to industrial or academic researchers on tactile design, tactile devices, and haptic perception, and artist and educators who are not familiar with haptics but who wish to establish haptic design and possible applications. Students who will start haptic researches are also welcomed audience.

### 4 SPEAKERS (tentative program)

1: Introduction: motivation and objectivities of this workshop	Y. Tanaka	10 min
2: Lecture: tactile perceptual structure	S. Okamoto	20 min
3: Presentation of a comfortable texture by each participant*		45 min
Participants will bring their favorite comfortable materials to the conference and explain feelings and reasons why they are selected. (break 15 min)		
4: Creation of own texture**		100 min
(1) How to make (by Y. Tanaka), (2) Making own texture (by each participant), (3) Presentation of resultant texture (by each participant), (4) Vote for comfortable texture		
5: Discussion	J. Watanebe	20 min

Total: 3h30min

\* We will inform participants before the conference. We also welcome participants who do not bring materials but want only to listen.

\*\* The numbers of the making kits are limited (about 30 sets). If participants are too many, we will make groups.

### 5 ORGANIZERS

Insert here details of each organizer as follows

- Assistant Prof., Yoshihiro Tanaka, Nagoya Institute of Technology
- Y. Tanaka received the Ph.D. in engineering from the Graduate School of Engineering, Tohoku University, in 2006. In the same year he worked as a research associate in Nagoya Institute of Technology. Currently, he is working as an assistant professor in the Graduate School of Engineering, the same university since 2009. He worked as a visiting researcher at Utrecht University in 2011. From 2014, he was a PRESTO researcher in the foundation of design of information infrastructure technologies harmonized with societies in Japan Science & Technology Agency. His research topics are quantitative evaluation of tactile feelings and tactile product design. He has often studied haptics under collaboration with manufacturing companies. Recently, he discussed the bidirectional relationship between touch behavior and tactile feelings.
- Senior Research Scientist / Associate Prof., Junji Watanabe, NTT Communication Science Laboratories / Tokyo Institute of Technology



- J. Watanabe received the Ph.D. in information science and technology from the University of Tokyo in 2005. From 2005 to 2009, he was a PRESTO researcher in the foundation of technology supporting the creation of digital media content in Japan Science & Technology Agency. From 2009 to 2011, he was a Research Fellow in the Japan Society for the Promotion of Science. He became a Research Specialist in NTT Communication Laboratories in 2011. He is also working as a visiting associate professor in Graduate School of Science and Engineering, Tokyo Institute of Technology since 2012. He studies cognitive science and communication devices with applied perception. He has often exhibited workshops on haptics. Currently, he is studying the establishment of the principles for evaluating the quality of tactile sensations based on the spatial distribution of tactile onomatopoeic words. The hands-on-workshop held in this workshop was organized by him and hosted many times in Japan.
- Assistant Prof., Shogo Okamoto, Nagoya University
- S. Okamoto received the Ph.D. in information sciences in 2010 from the Graduate School of Information Sciences, Tohoku University. Since 2010, he has been an assistant professor at the Graduate School of Engineering, Nagoya University. His research interests include haptic interfaces and human factors. Currently, he surveyed the tactile dimensionality of physical properties of materials in order to determine a common structure for these dimensions. His review paper was published in IEEE Transactions on Haptics, vol. 6, 2013.

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*For further info: please contact WHC2015 Workshop/Tutorial chairs at [Workshops@haptics2015.org](mailto:Workshops@haptics2015.org)*

### **Workshops and Tutorials Chairs**

Rob Gray (Arizona State University Polytechnic, USA)  
Mounia Ziat (Northern Michigan University, USA)  
Antonio Frisoli (Scuola Superiore Sant'Anna, Italy)