

## [2016]応用知覚科学研究センター活動報告：平成28年度（2016年度）

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平成28年度（2016年度）活動報告  
Annual Report 2016-2017



平成29年（2017年）10月  
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九州大学 大学院芸術工学研究院  
応用知覚科学研究センター

Research Center for Applied Perceptual Science  
Faculty of Design, Kyushu University



平成28年度（2016年度）活動報告  
Annual Report 2016-2017

ReCAPS



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## 1 ごあいさつ Greetings

### Small events

The Research Center for Applied Perceptual Science (ReCAPS) has worked for four years, and the fifth year will be a period to evaluate its real value. The most important role of the ReCAPS is probably to organize Perceptual Frontier Seminars. Our seminars are for everyone interested. It is not necessary to be a member of our center to take part in one of our seminars—we have regular seminar participants who are not members. The only conditions to join us are that presentations and discussion should be scientific and that English should be spoken even when all the participants are Japanese speakers.

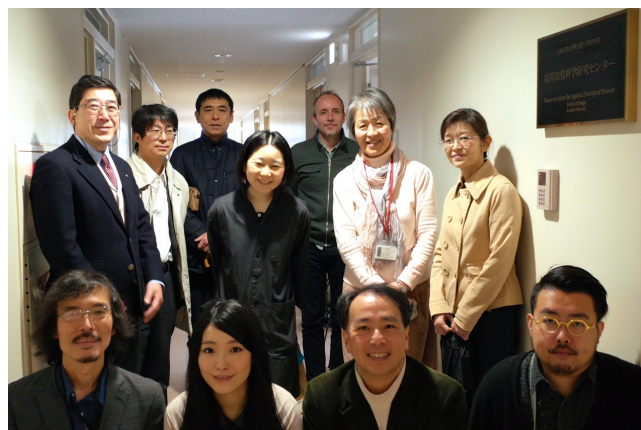
In the fiscal year 2016, we organized nine seminars. Two were mainly for students who were going to present their materials in international conferences, for music perception and psychology, held in San Francisco and Yokohama. It is my great pleasure to report that five of our graduate students somehow managed to give their very first official conference presentations in these major international conferences.

Three seminars were organized for two visiting students from Germany and Ireland. They did part of their studies on speech perception and thinking in Fukuoka. Their visits were very good stimuli for our students. We also received new students from Colombia, Indonesia, and China, and it seems like that our place has really become a crossroads of different cultures.

Three seminars were organized for visitors from Beijing, Toronto, and Kuala Lumpur, and the last seminar was to welcome a new ReCAPS member. These seminars were also utilized to give opportunities for our postdoctoral researchers and doctoral students to sum up what they are doing recently. They are investigating time perception, speech perception, and computer interfacing.

I would be glad if you could guess what we are aiming at in our activities. Although we sometimes organize big events, these everyday activities are the most important. Our small events are also interdisciplinary, and many of them are international. Many people loudly talk about globalization and innovation recently. I believe globalization and innovation, if they are really necessary, should be results of small stimulating things in life, and we are creating some.

Before finishing my greetings, I have to thank Masako Naoi, who worked for us for more than three



Just before the farewell lunch for Masako Naoi.



years. She not only did secretary business, but played a role to connect young and elder researchers. We had a farewell lunch with Masako and a new secretary Yuko Maruyama in March. This was not at all a farewell, however, because Masako and Yuko now often work together to prepare for the biggest event we have ever experienced, the 33rd Meeting of the International Society for Psychophysics (to be held in October in Fukuoka). This will be hosted by the ReCAPS, and I very much would like to report the results of their work next year with a smile.

Yoshitaka NAKAJIMA, PhD

注：当センターでは、学術上の公用語として英語を用いております。本報告は九州大学内での報告を主たる目的として作成したため、目次等は日本語でも記述しております。

## 2 構成員リスト Members

2017年（平成29年）3月31日現在

### 2.1 知覚脳科学グループ Perceptual and Brain-Scientific Research Group

中島 祥好 #, センター長	主幹教授	九州大学 大学院芸術工学研究院 デザイン人間科学部門
伊藤 裕之 #	主幹教授	九州大学 大学院芸術工学研究院 デザイン人間科学部門
須長 正治	准教授	九州大学 大学院芸術工学研究院 デザイン人間科学部門
Gerard Bastiaan REMIJJN	准教授	九州大学 大学院芸術工学研究院 デザイン人間科学部門
大井 尚行	准教授	九州大学 大学院芸術工学研究院 環境デザイン部門
冬野 美晴	助教	九州大学大学院 芸術工学研究院 コンテンツ・クリエイティブデザイン部門
飛松 省三*	教授	九州大学 大学院医学研究院 基礎医学部門
橋彌 和秀*	准教授	九州大学大学院 人間環境学研究院 人間科学部門
山本 健太郎*	講師	九州大学大学院 人間環境学研究院 人間科学部門

注：# は運営委員，\*は協力研究員。

Yoshitaka NAKAJIMA#, PhD, Director	Distinguished Professor	Faculty of Design
Hiroyuki ITO#, PhD	Distinguished Professor	Faculty of Design
Shoji SUNAGA, D. Eng.	Associate Professor	Faculty of Design
Gerard Bastiaan REMIJJN, PhD	Associate Professor	Faculty of Design
Naoyuki OI, D. Eng.	Associate Professor	Faculty of Design
Miharu FUYUNO, MA in English Linguistics, MA TESOL with Special Award, PhD	Assistant Professor	Faculty of Design
Shozo TOBIMATSU*, MD, PhD	Professor	Faculty of Medical Sciences
Kazuhide HASHIYA*, PhD	Associate Professor	Faculty of Human-Environment Studies
Kentaro YAMAMOTO*, PhD	Lecturer	Faculty of Human-Environment Studies

Note: A hash mark indicates a steering committee member, and an asterisk an associate member.

## 2.2 応用知覚学グループ Applied Perceptual Research Group

高木 英行	教授	九州大学 大学院芸術工学研究院 デザイン人間科学部門
上田 和夫 #	准教授	九州大学 大学院芸術工学研究院 デザイン人間科学部門
鏑木 時彦	教授	九州大学 大学院芸術工学研究院 コミュニケーションデザイン科学部門
上岡 玲子	准教授	九州大学 大学院芸術工学研究院 コンテンツ・クリエイティブデザイン部門
妹尾 武治*	准教授	九州大学 高等研究院
志堂寺 和則*	教授	九州大学 大学院システム情報科学研究所 情報学部門
光藤 宏行*	准教授	九州大学 大学院人間環境学研究院 人間科学部門
山田 祐樹*	准教授	九州大学 基幹教育院 人文社会科学部門

注：# は運営委員，\*は協力研究員。

Hideyuki TAKAGI, D. Eng.	Professor	Faculty of Design
Kazuo UEDA#, PhD	Associate Professor	Faculty of Design
Tokihiko KABURAGI, PhD	Professor	Faculty of Design
Ryoko UEOKA, PhD	Associate Professor	Faculty of Design
Takeharu SENO*, PhD	Associate Professor	Institute for Advanced Study
Kazunori SHIDOJI*, PhD	Professor	Faculty of Information Science and Electrical Engineering
Hiroyuki MITSUDO*, PhD	Associate Professor	Faculty of Human-Environment Studies
Yuki YAMADA*, PhD	Associate Professor	Faculty of Arts and Science

Note: A hash mark indicates a steering committee member, and an asterisk an associate member.

## 2.3 事務補佐員 Secretary

直井雅子 Masako NAOI (since December 2013)



### 3 本年度の活動実績 Activities

#### 3.1 日本音楽知覚認知学会 平成 28 年度春季研究発表会

日時： 2016 年 5 月 14 日（土）13:00-20:20, 15 日（日）9:30-12:40

会場： 九州大学大橋キャンパス 多次元デザイン実験棟 1 階, 実験ホール

共催： 九州大学大学院芸術工学研究院, 九州大学 応用知覚科学研究センター

プログラム： <http://jsmpc.org/archives/meetings/28s/>



### 3.2 The 26th Perceptual Frontier Seminar: San Francisco plus Yokohama Session

**Date and time:** Thursday, 16 June 2016, 18:30-20:30

**Venue:** 411, 1st floor, Build. 4, Ohashi Campus, Kyushu University

**Organizer:** Gerard B. REMIJN (Dept. Human Science/ReCAPS, Kyushu University)

The Seminar was organized as rehearsal of presentations at ICMPC14 (14th International Conference for Music Perception and Cognition, in San Francisco, CA, USA, from 5 to 9 July 2016) and at ICP2016 (International Congress of Psychology 2016, Yokohama, Japan, from 24 to 29 July 2016). It also provided an occasion to have a casual party after the presentations.

#### Program

1. The perception of a dotted rhythm embedded in a two-four-time framework  
Chinami Onishi, Yoshitaka Nakajima, and Emi Hasuo
2. Effects of the duration and the frequency of temporal gaps on the subjective distortedness of music fragments  
Kunito Iida, Yoshitaka Nakajima, Kazuo Ueda, Gerard B. Remijn, and Yukihiro Serizawa
3. Perceptual roles of power-fluctuation factors on noise-vocoded Japanese speech  
Takuya Kishida, Yoshitaka Nakajima, Kazuo Ueda, and Gerard B. Remijn
4. Intelligibility of locally time-reversed speech in Chinese, English, German, and Japanese  
Kazuo Ueda, Yoshitaka Nakajima, Shunsuke Tamura, Akihiko Shichida, Wolfgang Ellermeier, Florian Kattner, Stephan Daebler, and Ngar Nie Neo
5. Perceptual contrast between two adjacent time intervals marked by clicks  
Yoshitaka Nakajima, Mizuki Matsuda, Erika Tomimatsu, and Emi Hasuo  
Stimulus patterns of two adjacent time intervals,  $T_1$  and  $T_2$ , marked by clicks were employed, and either  $T_1$  or  $T_2$  served as a standard time interval to which a separate comparison time interval was adjusted to be subjectively equal. Both  $T_1$  and  $T_2$  were varied from 100 to 600 ms.  $T_2$  was overestimated by 60–140 ms when  $T_1 \leq 200$  ms and  $T_1 + 300 \leq T_2$  ms.  $T_1$  was also overestimated, but to a smaller extent, when  $T_2 \leq 200$  [ms] and  $T_1 = T_2 + 100$  or  $T_2 + 200$  [ms].

### 3.3 The 27th Perceptual Frontier Seminar: Yokohama Session

**Date and time:** Thursday, 30 June 2016, 18:30-20:30

**Venue:** 411, 1st floor, Build. 4, Ohashi Campus, Kyushu University

**Organizer:** Gerard B. REMIJN (Dept. Human Science/ReCAPS, Kyushu University)

The Seminar was organized as rehearsal of presentations at ICP2016 (International Congress of Psychology 2016, Yokohama, Japan, from 24 to 29 July 2016). It also provided an occasion to have a casual party after the presentations.

**Program**

1. Speech-to-Song Illusion in Japanese  
Asuka Ono, Yoshitaka Nakajima, Kazuo Ueda, Gerard B. Remijn
2. Influence of the temporal-unit duration on the intelligibility of English mosaic speech  
Kaori Kojima, Yoshitaka Nakajima
3. The effect of sound on visual grouping in a multi-stable stimulus  
Hiroaki Yano, Yoshitaka Nakajima, Kazuo Ueda, Gerard B. Remijn
4. Perceptual validity and analytical advantages of non-negative bases extracted from factor analyses of Japanese speech  
Kanshi Nakao, Takuya Kishida, Yoshitaka Nakajima
5. Effect of body posture on the interpretation of cast shadows  
Tomomi Koizumi, Hiroyuki Ito, Shoji Sunaga, Erika Tomimatsu
6. Change, not motion, determines subjective duration  
Erika Tomimatsu, Yoshitaka Nakajima, Mark A. Elliott, Hiroyuki Ito
7. Vection strength is determined by the subjective size of a visual stimulus modulated by amodal completion (preliminary results)  
Masaki Ogawa, Takeharu Seno, Hiroyuki Ito, Katsunori Okajima
8. Neural correlates of auditory temporal assimilation: an EEG and MEG study  
Takako Mitsudo

**3.4 The 28th Perceptual Frontier Seminar: Speech and Music**

**Date and time:** Wednesday, 10 August 2016, 16:30-18:00

**Venue:** 411, 1st floor, Build. 4, Ohashi Campus, Kyushu University

**Organizer:** Kazuo UEDA (Kyushu University/ReCAPS)

**Program**

1. "Pixelated speech": The role of spectral and loudness changes for the irrelevant speech effect  
Katharina ROST\*, Josef SCHLITTENLACHER\*, and Wolfgang ELLERMEIER\*  
\*Technical University of Darmstadt

The "irrelevant speech effect" describes the phenomenon that irrelevant background speech substantially disrupts memory performance; it is not sufficiently understood yet. The present experiment explored to what extent spectral and loudness changes influence the magnitude of irrelevant speech effect using "pixelated speech". Spectral changes seem to be the dominant factor in accounting irrelevant speech effect but its disrupting effect is surpassed with a combination of spectral and loudness changes.

2. The perception of a dotted rhythm embedded in a two-four-time framework  
Chinami ONISHI\*, Yoshitaka NAKAJIMA\*\*, and Emi HASUO\*\*\*

\*Human Science Course, Kyushu University, \*\*Department of Human Science/Research Center for Applied Perceptual Science, Kyushu University, \*\*\*College of Education, Psychology and Human Studies, Aoyama Gakuin University

The purpose of our study was to examine how a beat framework would affect discrepancy observed between proportion of physical durations and musical notation in a dotted rhythm. The participants were instructed to adjust the physical ratio between adjacent durations so as to reflect a notated rhythm as precisely as possible. The results indicated a tendency that the adjusted physical proportions of a dotted quaver were larger than a notated proportion, and this tendency was more prominent when a semiquaver preceded the dotted quaver, except when the dotted rhythm was located on the first beat of the second bar.

### 3. The temporal structure of English speech in public speaking

Shimeng LIU\*, Yuko YAMASHITA\*\*, Yoshitaka NAKAJIMA\*, Kazuo UEDA\*, Gerard B. REMIJN\*, and Miharū FUYUNO\*

\*Kyushu University, \*\*Shibaura Institute of Technology

To investigate the role of pause duration in public speaking, we recorded 11 Japanese university students' speech in Fukuoka during an English speech contest. The pause durations in speech were semi-automatically extracted and measured by using a computer software praat; the results showed that the pause duration for periods had to be longer than for commas and others, to achieve high scores at the contest. We are planning to obtain more English speech samples spoken by non-natives with other language backgrounds.



### 3.5 The 29th Perceptual Frontier Seminar: Poster Symposium in Summer

**Date and time:** Monday, 22 August 2016. Part I, 15:00-15:50; Part II, 16:00-18:00

**Venue:** Part I, Office of Kazuo UEDA (709), 7th Floor, Build. 3, Ohashi Campus, Kyushu University; Part II, Lobby, 1st Floor, Build. 3, Ohashi Campus, Kyushu University

**Organizer:** Yoshitaka NAKAJIMA (Kyushu University/ReCAPS)

#### Program

##### Part I: Oral Presentation

15:00-15:50

##### 1 Audiovisual correspondences between cover art images and music tracks

Chihiro HIRAMATSU\*, Shinnosuke OGATA\*, and Takeharu SENO\*

\*Kyushu University

Factors influencing audiovisual correspondences were investigated using cover art images associated with music tracks. Music-image matching, visual classification of cover art images and statistics of image and music features were analyzed. Cognitive and/or semantic aspects of images and music features related to rhythm, tone and timber were suggested to be important factors.

##### Part II: Poster Symposium (with posters for other conferences)

##### 1. Making demo-movies of various vection stimuli

Emi SETOGUCHI\* and Takeharu SENO\*

\*Kyushu University

Making demo-movies of vection stimuli that were based on over 30 psychological published articles, as many as possible was challenged. There has been no such challenge in psychology so far. Those movies can contribute to science and also art-entertainment.

##### 2. Effects of prior walking context on the vection induced by different types of global optic flow

Takeharu SENO\*, Stephen PALMISANO\*\*, and Shinji NAKAMURA\*\*\*

\*Kyushu University, \*\*University of Wollongong, \*\*\*Nihon Fukushi University

In this study, the effects of prior walking context on the vection were investigated. Nineteen participants walked or sat for five minutes while wearing either iron or wooden clogs, and then vection was induced by the radial flow with or without added simulated viewpoint oscillation. The results showed that vection strength was inhibited by walking with iron clogs (relative to walking with wooden clogs or being seated with both types of clogs) and always facilitated by adding oscillation.

##### 3. A new bias in repeated serial subjective estimation

Emi SETOGUCHI\* and Takeharu SENO\*

\*Kyushu University

The results of 20 contests of Japanese comedians (R-1, M-1 and King of Conte) in which 8 comedians were repeatedly estimated by their skills of comedy by professional reviewers, was analyzed. Secondary, a vection experiment in which 12 naïve participants subjectively



estimated vection strength 8 times was conducted. Then the obtained values became increased along with the trial numbers.

#### 4. Construction of a model of vection

Takeharu SENO\*, Ken-ichi SAWAI\*\*, Masaki OGAWA\*, Toshihiro WAKEBE†, Hidetoshi KANAYA‡, Kim JUNO†\*, and Stephen PALMISANO\*\*\*

\*Kyushu University, \*\*University of Tokyo, †Fukuoka Jo Gakuin University, ‡Aichi Shukutoku University, †\*University of Sydney, \*\*\*University of Wollongong

A model of vection by using three indexes (latency, duration and magnitude of vection) was presented in this study. The model was consisted of two waves that vary over time, i.e. sinusoidally modulated strength and exponentially increased strength and we also simulated 10000-trials by using our model. Then the simulated results of the distributions of latency, duration and magnitude were very similar to the obtained real data.

#### 5. Subjective sleepiness and vection strength can be correlated

Takeharu SENO\*, Masaki OGAWA\*, Kouhei MATSUMORI\*, and Shigekazu HIGUCHI\*

\*Kyushu University

This study revealed that the sleep deprivation had a facilitation effect on self-motion perception (vection). The strength of vection was measured in two conditions: sleep-deprivation and normal sleep conditions. In the sleep deprivation condition, participants did not sleep for about 20 hours. Magnitudes of vection and subjective sleepiness were significantly positively correlated.

#### 6. Developing effective instructions to decrease Japanese speaker's nervousness during English and Japanese public speeches: Evidence from psychological and physiological measurements

Miharu FUYUNO\*, Yuko YAMASHITA\*\*, Yuki YAMADA\*, and Yoshitaka NAKAJIMA\*

\*Kyushu University, \*\*Shibaura Institute of Technology

This study examines the nervousness of Japanese speakers during public speeches in English and Japanese to develop an instruction module that is effective for decreasing speakers' nervousness. Heart-rate variability values, Profile of Mood States (POMS2), and original questionnaire sheets were used to evaluate the nervousness in participants. The results indicated that the experimental group showed less nervousness, especially during English speeches, in the second performance.

#### 7. Development of a multimedia Spanish language learning application: based on ADDIE model and Unity 3D platform

Laura Maria BLANCO CORTES\* and Miharu FUYUNO\*

\*Kyushu University

This study aims to develop a multimedia Spanish language learning application with a focus on authentic materials and ADDIE (Analysis-Design-Development-Implementation-Evaluation) model. After analyzing needs and designing lesson contents, a prototype of application was developed with Unity 3D engine. This study finally discusses results from a questionnaire survey that was performed to evaluate the effects of the prototype.

#### 8. The effect of continuity of motion on vection

Yoshitaka FUJII\* and Takeharu SENO\*

\*Kyushu University

The effect of frame rate of movie on vection was investigated in wide range (3 to 60 fps). Downward and expanding grating movies were used as vection stimuli and the strength of vection was measured. The results showed that a significant effect of frame rate was obtained in both stimuli, and vection induced by expanding grating had more rapid increase with increasing the frame rates than by downward grating.

**9. The effect of frame rate and motion blur on vection**

Yoshitaka FUJII\*<sup>1</sup>\*<sup>2</sup>, Robert S. ALLISON\*<sup>1</sup>, Pearl S. GUTERMAN\*<sup>1</sup>, and Laurie M. WILCOX\*<sup>1</sup>

\*<sup>1</sup> York University (Canada), \*<sup>2</sup> Currently in Kyushu University

The effect of frame rate and motion blur on vection was investigated in this study. Observers moved forward in a town rendered with 3-D computer graphics and responded vection strength. The results show that motion speed has very strong effect, frame rates also have significant effect, but motion blur has no effect to vection.

**10. Effect of body posture on the interpretation of cast shadows**

Tomomi KOIZUMI\*, Hiroyuki ITO\*, Shoji SUNAGA\*, and Erika TOMIMATSU\*

\*Kyushu University

It was investigated whether the light-from-above (or above-left) assumption was used in the interpretation of cast shadows, and how gravity influenced this light assumption. With four observation postures (sitting, lying-on-left, right, and back), relative strength of perceptual correspondence between the center disk and the adjacent cast shadows was measured. Results indicated that the light-from-above-left assumption was used and the directional bias of preferred shadow might have been determined by both body posture and gravity.

**11. Importance of trichromatic color vision for detecting monkey facial coloration: A functional substitution approach**

Chihiro HIRAMATSU\*, Amanda D. MELIN\*\* William L. ALLEN\*\*\*, Constance DUBUC\*\*\*\*, and James P. HIGHAM\*\*\*\*\*

\*Kyushu University, \*\*University of Calgary, \*\*\*Swansea University, \*\*\*\*University of Cambridge, \*\*\*\*\*New York University

Optimal color vision to detect reproductive status of female macaque monkeys was investigated. Performance in detecting a proceptive (i.e. sexually active) face against a non-proceptive face was compared among five simulated color vision types and common trichromatic color vision. Results suggested that common trichromatic color vision confers excellent ability to detect meaningful variation in primate face color.

**12. The effect of sound on visual grouping in a multi-stable stimulus**

Hiroaki YANO\*, Yoshitaka NAKAJIMA \*\*, Kazuo UEDA\*\*, and Gerard B.REMIJN\*\*

\*Graduate School of Design, Kyushu University, \*\*Department of Human Science/Research Center for Applied Perceptual Science, Kyushu University

The effects of auditory stimuli on Polka dance perception, which reflects audiovisual integration on visual grouping of moving objects, was investigated. The task of the participants was to

report the motion percept of the two bars on the computer screen, as perceived during the final motion of the bars. The results showed that the presentation of a click at the bars' point of coincidence facilitated the bouncing percept, and auditory motion information from a click train panned between the speakers facilitated visual clockwise rotation.

**13. Cortical hemodynamic response patterns to normal and whispered speech in 3- to 7-year-old children**

Gerard B. REMIJN\*, Mitsuru KIKUCHI\*\*, Yuko YOSHIMURA\*\*, Kiyomi SHITAMICHI\*\*, Sanae UENO\*\*, and Yoshio MINABE\*\*

\*Faculty of Design/Research Center for Applied Perceptual Science, Kyushu University,

\*\*Faculty of Medical Science/Research Center for Child Mental Development, Kanazawa University

The purpose of this study was to assess cortical hemodynamic response patterns in 3- to 7-years old children listening to two speech modes: normally-vocalized and whispered speech. Near-infrared spectroscopy (NIRS) was used to assess changes in cortical oxygenated hemoglobin from 16 typically developing children. Specifically over areas that represent speech articulatory body parts and motion, such as the larynx, lips, and jaw, the children showed higher oxygenated hemoglobin for whisper than for normal speech over left ventral sensory-motor cortex (vSMC), which can be attributed to inner (covert) practice or imagination of the different articulatory actions necessary to produce whisper as opposed to normal speech.

**14. Effects of factor elimination on the intelligibility of noise-vocoded Japanese speech**

Takuya KISHIDA\*, Yoshitaka NAKAJIMA\*\*, Kazuo UEDA\*\*, and Gerard B. REMIJN\*\*

\*Graduate School of Design, Kyushu University, \*\*Department of Human Science/Research Center for Applied Perceptual Science, Kyushu University

The purpose of the study was to investigate perceptual roles of 4 power-fluctuation factors extracted from 20 critical-band power fluctuations of speech with an origin-shifted principal component analysis followed by a varimax rotation. Three male native speakers of Japanese listened to noise-vocoded Japanese speech resynthesized from 3 of the 4 power-fluctuation factors, and reported words what they heard. Intelligibility of the resynthesized noise-vocoded speech considerably decreased when factor 2, covering 570-1370 Hz, was eliminated.

**15. Origin-shifted principal component analysis: A method suitable for reconstructing non-negative data**

Takuya KISHIDA\*, Kanshi NAKAO\*, and Yoshitaka NAKAJIMA\*\*

\*Graduate School of Design, Kyushu University, \*\*Department of Human Science/Research Center for Applied Perceptual Science, Kyushu University

Power fluctuations of speech sounds separated into 20 critical bands were analyzed with a modified version of principal component analysis, i.e., origin-shifted principal component analysis, in which calculated eigenvectors originated from the zero point of the data. The extracted principal components were suitable for resynthesizing speech sounds because the resynthesized speech sounds were not accompanied by stationary background noise as would have appeared in a conventional principal component analysis as the error in predicting the

acoustically silent point. Origin-shifted principal component analysis seems to be applicable to analyze and resynthesize various non-negative multivariate data.

**16.** The speech to song illusion in Japanese

Asuka ONO\*, Yoshitaka NAKAJIMA\*\*, Kazuo UEDA\*\*, and Gerard B. REMIJN\*\*

\*Graduate School of Design, Kyushu University, \*\*Department of Human Science/Research Center for Applied Perceptual Science, Kyushu University

A spoken sentence can be heard as a sung sentence by simply repeating it. So far, this so-called speech-to-song illusion has been investigated with stress-accented, stress-timed languages with regular durational contrasts between vowels, with the use of a 5-point rating scale ('1' for 'speech', '5' for 'song'). Here we show that the illusion also occurs in Japanese, a mora-timed, pitch-accented language with a regular duration of morae and strict rules on pitch patterns.

**17.** Change, not motion, determines subjective duration

Erika TOMIMATSU\*, \*\*, Yoshitaka NAKAJIMA\*, Mark A. ELLIOTT\*,\*\*\*,\*\*\*\* and Hiroyuki ITO\*

\*Kyushu University, \*\* Japan Society for the Promotion of Science, \*\*\*National University of Ireland, Galway, \*\*\*\*Sunway University

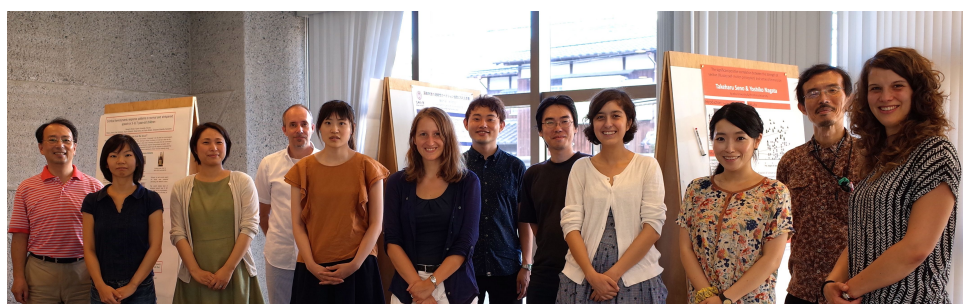
The purpose of the present study was to reveal the influence of temporal and spatial changes on perceived durations. We inserted some blanks into dynamic-random-dot and static-random-dot durations in order to compare the perceived durations with/without the temporal and spatial changes, and participants answered the perceived durations by the method of reproduction. Our results show that the temporal changes were enough to lengthen the perceived duration.

**18.** Intelligibility of locally time-reversed speech in four languages: Chinese, English, German, and Japanese

Kazuo UEDA\*, Yoshitaka NAKAJIMA\*, Wolfgang ELLERMEIER\*\*, and Florian KATTNER\*\*

\*Department of Human Science/Research Center for Applied Perceptual Science, Kyushu University, \*\*Institut fuer Psychologie, Technische Universitaet Darmstadt

It was examined how the intelligibility of spoken sentences in Chinese, English, German, and Japanese changes as the duration of segments locally reversed in time increases. Intelligibility was above 90% when segment duration was 45 ms, but dropped with increasing segment duration to below 10% at 120 ms. The 50% intelligibility point was observed for segment durations of around 65-80 ms irrespective of language. This finding and the majority of the previous literature strongly suggest that a common time-averaging mechanism works in speech perception across different languages.



### 3.6 The 30th Perceptual Frontier Seminar

**Date and time:** Thursday, 29 September 2016, 10:00-11:30

**Venue:** 411, 1st floor, Build. 4, Ohashi Campus, Kyushu University

**Organizer:** Kazuo UEDA (Kyushu University/ReCAPS)

#### Program

1. Analysis of temporal structure of English speech in public speaking presented by Japanese EFL Learners

Shimeng LIU\*, Yuko YAMASHITA\*\*, Yoshitaka NAKAJIMA\*, Kazuo UEDA\*, Gerard REMIJN\*, and Miharuru FUYUNO\*

\*Kyushu University, \*\*Shibaura Institute of Technology

To investigate the role of pause duration in public speaking, we recorded 11 Japanese university students' speech in Fukuoka during an English speech contest. The pause durations in speech were semi-automatically extracted and measured by using a computer software 'praat'; the results showed that the pause coefficient variation value of the participants who got the high score in the competition was about 0.6, and the lower coefficient variation value the participant got, the higher evaluation they had. It is recommendable to find more objective index, such as the speech rate in syllables per minute which indicates an articulation rate, and a mean length of runs.

2. Verbal and non-verbal behaviors during public speaking performed by Irish university students Yuko YAMASHITA\*, Miharuru FUYUNO\*\*, Yoshitaka NAKAJIMA\*\*, Stanislava Antonijevic-ELLIOT\*\*\*, and Mark A. ELLIOT\*\*\*

\*Shibaura Institute of Technology, \*\*Kyushu University, \*\*\*National University of Ireland, Galway

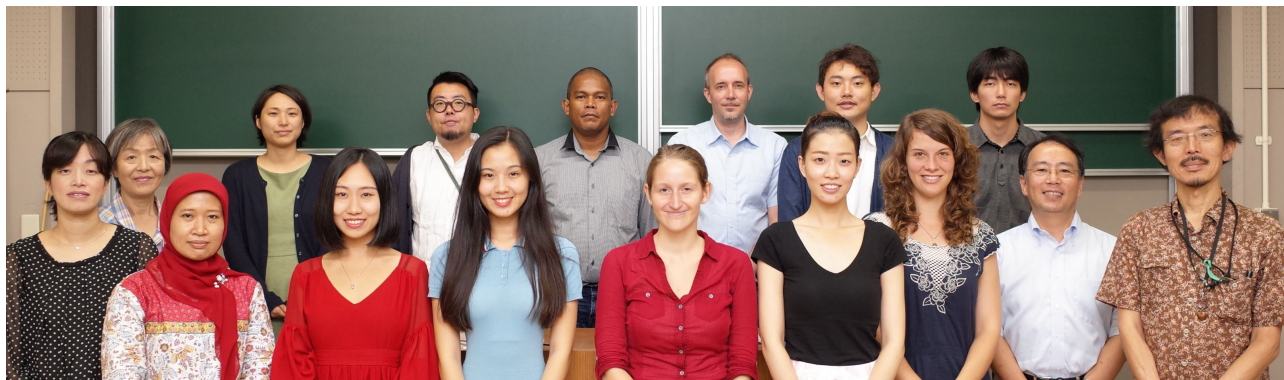
The purpose of this study was to explore verbal and non-verbal behaviors of public speaking performances with Irish native English speakers. Speech rate, pauses, and gaze behavior were analyzed. The results will be discussed in this talk.

3. Try it in reverse! Different variants of reversed speech and their influence on the Irrelevant Speech Effect

Katharina ROST\*, Kazuo UEDA\*\*, Yoshitaka NAKAJIMA\*\*, Wolfgang ELLERMEIER\*, and Florian KATTNER\*

\*Technische Universität Darmstadt, \*\*Kyushu University

Locally time-reversing techniques are useful tools that realize systematic manipulation about not only speech intelligibility in general, but also patterns of prosody and phonetical information in speech recordings. In this pilot study different kinds of reversed speech (reversed, locally reversed, and reversed locally reversed speech) were used for testing the influence of patterns of prosody and phonetical information on the 'Irrelevant Speech Effect', a phenomenon, which describes the disturbing influence of speech on the memory performance. The results will be presented and discussed.



### 3.7 小松英海先生講演会

日時： 2016年10月7日（金）17:00-18:00

会場： 九州大学大橋キャンパス4号館1階411教室

講演題目： 動くものの知覚

講師： 小松英海（慶應義塾大学自然科学研究教育センター共同研究員）

企画・司会者： 妹尾武治（九州大学・九州大学応用知覚科学研究センター）

後援： 九州大学応用知覚科学研究センター

講演要旨： 私たちの知覚の常態は運動状態である。静止状態がむしろ例外である。動きの中に私たちは様々な事柄を見出す。本講演では、幾つかの運動知覚現象のデモンストレーションを行い、それを素材に豊穡な我々の知覚世界を考えてみたい。

講師来歴： 1968年4月、奈良県生まれ。2002年に慶應義塾大学社会学研究科において博士（心理学）を取得。（財）労働科学研究所特別研究員/（財）長寿科学振興財団リサーチレジデントを経て、現在、慶應義塾大学自然科学研究教育センター共同研究員及び商学部非常勤講師。

これまでの研究の概要： 主として運動対象間のまとまり及び関係の知覚についての研究を行ってきた。これまで、単なる幾何学図形の動きの中に、生き物らしさ、自発性、何ものかに働きかけようとする意図、そして感情関係が知覚されることを実験現象学的アプローチから示してきた。また、触運動知覚による対象同定の探索的な過程について検討を行って来た。近年は皮膚感覚による自己運動知覚についての一連の研究を行っている。





### 3.8 The 31st Perceptual Frontier Seminar: Temporal Organization in the Brain

**Date and time:** Thursday, 15 December 2016, 14:00-16:00

**Venue:** 709 (Kazuo Ueda's office), 7th floor, Build. 3, Ohashi Campus, Kyushu University

**Organizer:** Yoshitaka NAKAJIMA (Kyushu University/ReCAPS)

Time takes many different forms, but different temporal forms tend to be united into a single time. This is also the case in our brain. The newest topics related to this issue will be presented in order to find new connections between different frontiers.

#### Program

1. Assimilation and contrast between two adjacent time intervals marked by sound bursts  
Yoshitaka Nakajima\*  
\*ReCAPS, Faculty of Design, Kyushu University
2. Somatosensory evoked field in response to visuo-tactile stimuli presented to young children  
Gerard B. Remijn\* et al.  
\*ReCAPS, Faculty of Design, Kyushu University
3. Temporal averaging and cross-modal assimilation  
Lihan Chen\*  
\*School of Psychological and Cognitive Sciences, Peking University
4. Neural correlates of perceptual inequality in auditory temporal assimilation paradigm  
Takako Mitsudo\*  
\*Department of Clinical Neurophysiology, Kyushu University



### 3.9 日本音響学会聴覚研究会

開催日： 2016年12月17日（土），18日（日）

場所： 九州大学大橋キャンパス3号館2階322教室

世話役： 上田和夫（九州大学 大学院芸術工学研究院／応用知覚科学研究センター）

共催： 日本音響学会九州支部，九州大学大学院芸術工学研究院，九州大学応用知覚科学研究センター

一日目午後に，Professor Lihan Chen（除立翰，北京大学）による招待講演“Temporal perceptual grouping and transfer in a multisensory context”を含む，英語セッションを設けます。

#### 招待講演アブストラクト

“Temporal perceptual grouping and transfer in a multisensory context”

Lihan Chen<sup>\*,\*\*</sup>, Lu Guo<sup>\*\*\*</sup>, Yingqi Wan<sup>\*</sup>, Ming Bao<sup>\*\*\*</sup>

<sup>\*</sup>School of Psychological and Cognitive Sciences, Peking University, Beijing, China

<sup>\*\*</sup>Key Laboratory of Machine Perception (Ministry of Education), Peking University, Beijing, China

<sup>\*\*\*</sup>Institute of Acoustics, Chinese Academy of Sciences, Beijing, China

Multisensory processing within seconds is pivotal for many perceptual and cognitive tasks. Here we adopted the research paradigms of temporal ventriloquism, priming and illusory (auditory) gap transfer to address the guiding principles of intra-modal and cross-modal temporal perceptual grouping. We used methods of psychophysics, fMRI and MEG to investigate the (ensemble) coding of temporal events and the underpinning neural signatures. The accumulated evidence has also shown that our brain takes a centralized temporal representation and the benefits of temporal training of events in one sensory modality could be quickly transferred to another modality.

Keywords: Temporal; Perceptual grouping; Ternus display; psychophysics; MEG; fMRI

#### プログラム

##### 12月17日（土）

##### 1. 13:30–14:00 日本語における歌化錯覚

○小野明日香，中島祥好，上田和夫，Remijn, Gerard B.（九大）

##### 2. 14:00–14:30 基本周波数の高低関係と声の高さの印象の反転現象 — 声の音色の違いによるピッチ感への認知的バイアス —

○内田照久（大学入試センター）

#### < English Session >

##### 3. 14:40–15:10 Analysis of temporal structure of English speech in public speaking presented by Japanese EFL Learners

○Shimeng Liu (Kyushu Univ.), Yuko Yamashita (Shibaura Institute of Technology), Yoshitaka Nakajima (Kyushu Univ.)



4. 15:10–15:40 Effect of modifying modulation spectrogram on vocal emotion perception for noise-vocoded speech  
○ Zhi Zhu, Ryota Miyauchi (JAIST), Yukiko Araki (Kanazawa Univ.), Masashi Unoki (JAIST)
5. 15:50–16:20 Pupillary Responses Reveal an Asymmetry of Transition Detection between Regular and Random Frequency Patterns  
○ Hsin-I Liao, Makio Kashino, Shigeto Furukawa (NTT)
6. 16:20–16:50 The correlation between visually and auditorily induced vection magnitude and latency might suggest the same basic mechanism for self-motion perception  
○ Takeharu Seno, Hiroataka Sato (Kyushu Univ.), Nobu Shirai (Niigata Univ.), Aleksander Valjamae (Tallinn Univ.)
7. 17:00–18:00 [Invited Talk] Temporal perceptual grouping and transfer in a multisensory context  
○ Lihan Chen (Peking Univ.), Lu Guo (Chinese Academy of Sciences), Yingqi Wan (Peking Univ.), Ming Bao (Chinese Academy of Sciences)

12月18日(日)

8. [発表取りやめ]
9. 10:30–11:00 母音の無声化が促音・非促音の知覚範疇境界に及ぼす影響  
○天野成昭(愛知淑徳大) 山川仁子(尚綱大)
10. 11:10–11:40 モザイク処理した刺激における音声と雑音の分離  
○仲田愛子, 中島祥好, 上田 和夫, Remijn, Gerard B. (九大)
11. 11:40–12:10 打撃音による材質知覚：残響とその提示文脈が与える影響  
○上村卓也, 古川茂人 (NTT)



### 3.10 The 32nd Perceptual Frontier Seminar: How to Measure Capacities of the Auditory System

**Date and time:** Tuesday, 17 January 2017, 9:30-11:30

**Venue:** Room 601 on the 6th floor, Building 3, Ohashi Campus, Kyushu University

**Organizer:** Yoshitaka NAKAJIMA (Kyushu University/ReCAPS)

#### Program

**1.** Factor analyses of Japanese speech utilizing non-negative bases

Kanshi NAKAO\*, Takuya KISHIDA\*, and Yoshitaka NAKAJIMA\*\*

\*Graduate School of Design, Kyushu University

\*\*Department of Human Science/ReCAPS, Faculty of Design, Kyushu University

Power fluctuations of Japanese speech in 20 narrow frequency bands simulating the auditory periphery were subjected to a new type of factor analysis. Negative factor loadings were shifted to zero, and each variable was represented by the factor with the greatest factor loading. Thus, orthogonal non-negative bases were obtained. We resynthesized the speech by changing the intensity of each ‘factor’ utilizing the fluctuation of the corresponding factor score. It was shown that four factors were adequate to resynthesize reasonably intelligible speech. A big leap of intelligibility came out when the number of factors increased from 2 to 3, coinciding with our previous results.

**2.** Perceptual roles of 4 power-fluctuation factors in Japanese speech

Takuya KISHIDA\*, Yoshitaka NAKAJIMA\*\*, Kazuo UEDA\*\*, and Gerard B. REMIJN\*\*

\*Graduate School of Design, Kyushu University

\*\*Department of Human Science/ReCAPS, Faculty of Design, Kyushu University

We performed a listening experiment to investigate perceptual roles of 4 power-fluctuation factors extracted from 20-critical-band power fluctuations of Japanese speech. The intelligibility of Japanese noise-vocoded speech outstandingly decreased when factor 2, which covered 500–1200 Hz, was eliminated. The results suggested that the information given by factor 2 was vital for speech intelligibility.

**3.** A peripheral model of gap detection

Willy WONG\*

\*University of Toronto

Gap detection is an important measure of the temporal resolution of the auditory system. We present a model of gap detection involving the statistics of peripheral auditory neural activity: Detecting a gap involves the detection of an interval that is different from the usual interspike interval found in the auditory spike train. The model is capable of resolving a number of important observations in empirical gap research including why across-channel (or across-frequency) gap detection is an order of magnitude larger than gap detection performed in channel (i.e., using the same frequency). We achieve this by recognizing that in-channel detection involves a different strategy than across-channel detection. The model also provides an explanation for why the intensity dependence of gap detection is limited to a 40 dB range,

and why critical bands are crucial towards defining the notion of a channel in gap detection. Specific predictions can be made about the shapes of the psychometric functions.

### 3.11 The 33rd Perceptual Frontier Seminar: Human Communication, Perception, and Computer Interfacing

**Date and time:** Tuesday, 7 March 2017, 14:00-16:00

**Venue:** Room 411, Building 4, Ohashi Campus, Kyushu University

**Organizer:** Gerard B. REMIJN (Kyushu University/ReCAPS)

#### Program

**1.** An introduction of spatial filter in BCI for classification using machine learning

Mohd Ibrahim SHAPIAI\*

\*Department of Electronics Systems Engineering, Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Kuala Lumpur, Malaysia

Brain-Computer Interfacing (BCI) is a demanding task as the recorded electroencephalogram (EEG) signal is not only noisy and has limited spatial resolution but it is also intrinsically non-stationary. The non-stationarities in the signal may come from many different sources, for instance electrode artifacts, muscular activity or changes of task involvement, and often decline the classification performance. Among them, spatial filters and selecting the most appropriate frequency bands and related signal in the frequency domain are known to improve classification accuracy. We will look at some advantages and disadvantages of several spatial filter especially in extracting the important feature for typical EEG research on BCI. Also, we will further discuss on one popular spatial filter known as common spatial pattern (CSP). The extracted feature then will be used for classification using machine learning technique. A brief discussion on specific machine learning technique will be shared. The talk aims to encourage discussion and exchange of ideas among the audience – BCI with spatial filter for classification using machine learning.

**2.** User authentication with eye-tracking and visual password formation to prevent shoulder surfing  
Yesaya Tommy PAULUS\*, Chihiro HIRAMATSU\*\*, Yvonne KAM HWEI SYN\*\*\*, Gerard B. REMIJN\*\*

\*Graduate School of Design, Kyushu University, Fukuoka, Japan

\*\*Department of Human Science / Research Center for Applied Perceptual Science, Kyushu University, Fukuoka, Japan

\*\*\*Faculty of Engineering, Malaysia Multimedia University, Cyberjaya, Malaysia

As a new visual password method, eye-tracking can be used to facilitate eye-gaze authentication on public screens, such as for ATMs. In order to determine the best visual password format that can be used safely and reliably in public by any user, including the elderly, we will focus on factors important in authentication enrollment, such as the role of viewing distance, viewing angle, and lighting conditions. We will also focus on finding the most suitable visual password format as regards the amount of visual objects, user eye-movements, and gaze duration.

**3.** Intelligibility of English mosaic speech: Influence of manipulating mosaic block duration

Santi\*, Yoshitaka NAKAJIMA\*\*

\*Graduate School of Design, Kyushu University, 4-9-1 Shiobaru, Minami-ku, Fukuoka, 815-8540 Japan

\*\*Department of Human Science, Faculty of Design, Kyushu University/Research Center for Applied Perceptual Science, 4-9-1 Shiobaru, Minami-ku, Fukuoka, 815-8540 Japan

The purpose of this research is to observe the influence of manipulating block duration on the intelligibility of mosaic speech. The original speech samples were transformed into mosaic form using J Software. A silent part of 20 ms was always at the beginning of the original speech samples, and the whole signal was divided into narrow frequency bands of one critical bandwidth each covering 100-4400 Hz. A rise and a fall time of 4 ms were given to the mosaic blocks. Listeners were able to hear intelligible speech when mosaic block duration ranged from 20 to 80 ms.



### 3.12 The 34th Perceptual Frontier Seminar: Time Perception

**Date and time:** Tuesday, 21 March 2017, 17:00-18:30

**Venue:** Room 601, Building 3, Ohashi Campus, Kyushu University

**Organizer:** Yoshitaka NAKAJIMA (Kyushu University/ReCAPS)

#### Program

1. Perceptual assimilation and contrast between time intervals marked by sound bursts

Yoshitaka NAKAJIMA\*

\*Department of Human Science/ReCAPS, Faculty of Design, Kyushu University

When two adjacent time intervals up to 600 ms, T1 and T2 in this order, are marked by very short sound bursts, their durations are perceptually assimilated to or contrasted against one another in some conditions. Assimilation and contrast are more conspicuous in T2 than in T1 indicating temporal asymmetry. Contrast takes place only as overestimation of T1 or T2. The relationship between different sensory modalities is another issue to be examined.

2. Filled duration illusion in vision

Erika TOMIMATSU\*

\*Faculty of Design, Kyushu University

When we compare the subjective length of an unfilled duration delimited by two short sounds, with that of the filled duration of a continuous sound, the filled duration is often perceived as the longer even though they are physically equivalent. In the present study, we investigated whether this filled-duration illusion would obviously occur also in vision with durations within one second. We employed random-dot figures as duration markers presented on mean-luminance background to avoid afterimages. The results showed that, also in the visual modality, the filled-duration illusion occurred for durations within one second.

### 3. The effects of speed and frequency on perceived duration

Kentaro YAMAMOTO\*

\*Faculty of Human-Environment Studies, Kyushu University

While it is known that perceived duration is distorted by visual motion, there is ongoing debate as to which factor plays a key role in the duration distortion. Here, we manipulated the speed and direction alternation frequency of moving objects and measured perceived duration to determine which is more important. The results suggested that both factors influenced perceived duration, and the magnitude of the effects varied depending on the salience of each feature.

#### 3.13 直井さん慰労昼食会

日時： 2017年3月31日（金）12:00-13:50

会場： ウエスト大橋店（中国料理）

幹事： 中島祥好（九州大学/ReCAPS）

長らく ReCAPS の事務補佐員としてご活躍くださった直井雅子さんが定年退職され、3月31日（金）が最後のご勤務となりました。これを記念して、後任の圓山裕子さんを交え、記念撮影のあと昼食会を開催しました。今後のご健康とご多幸をお祈りいたします。



## 4 業績リスト Publications

2017年（平成29年）3月31日現在

### 4.1 知覚脳科学グループ Perceptual and Brain-Scientific Research Group

#### 1. 中島 祥好 研究室 Yoshitaka NAKAJIMA

##### (a) 英語学術論文・出版物 English Publications

- 1) Ueda, K., and Nakajima, Y. (2017). An acoustic key to eight languages/dialects: Factor analyses of critical-band-filtered speech, *Scientific Reports*, 7, 42468, doi: 10.1038/srep42468.
- 2) Komiya, R., Saitoh, T., Fuyuno, M., Yamashita, Y., and Nakajima, Y. (2017). Head pose estimation and motion analysis of public speaking videos, *International Journal of Software Innovation*, 5, 1, 57–71.
- 3) Nagaike, A., Mitsudo, T., Nakajima, Y., Ogata, K., Yamasaki, T., Goto, Y., Tobimatsu, S. (2016). ‘Time-shrinking perception’ in the visual system: A psychophysical and high-density ERP study, *Experimental Brain Research*, 234, 11, 3279–3290.
- 4) Kishida, T., Nakajima, Y., Ueda, K., and Remijn, G. B. (2016). Three factors are critical in order to synthesize intelligible noise-vocoded Japanese speech, *Frontiers in Psychology*, 10, 3389.

##### (b) 国際会議発表 International Conference Presentations

- 1) Onishi, C., Nakajima, Y., and Hasuo, E. (6 July 2016). The perception of a dotted rhythm embedded in a two-four-time framework, 14th International Conference for Music Perception and Cognition, San Francisco, USA.
- 2) Iida, K., Nakajima, Y., Ueda, K., Remijn, G. B. and Serizawa, Y. (5 July 2016). Effects of the duration and the frequency of temporal gaps on the subjective distortedness of music fragments, 14th International Conference for Music Perception and Cognition, San Francisco, USA.
- 3) Nakajima, Y., Matsuda, M., Tomimatsu, E., Hasuo, E. (26 July 2016). Perceptual contrast between two short adjacent time intervals marked by clicks, 31st International Congress of Psychology, Yokohama, Japan.
- 4) Nakajima, Y. (26 July 2016). Principles of music perception, 31st International Congress of Psychology, Yokohama, Japan.
- 5) Nakajima, Y. (30 November 2016). Perceptual interactions between adjacent time intervals marked by sound bursts, 5th Joint Meeting, Acoustical Society of America and Acoustical Society of Japan, Honolulu, USA.

#### 2. 伊藤 裕之 研究室 Hiroyuki ITO

##### (a) 英語学術論文・出版物 English Publication

- 1) Koizumi, T., Ito, H., Sunaga, S., and Ogawa, M. (2017). Directional Bias in the Perception of Cast Shadows, *i-Perception*, 8, 1, 1–17.

- 2) Tomimatsu, E., and Ito, H. (2016). Directional bias of illusory stream caused by relative motion adaptation, *Vision Research*, 124, 34–43.

(b) 日本語学術論文・出版物 Japanese Publications

- 1) 伊藤裕之, 小泉智美, 徳永唯香 (2016). TVアニメーションに用いられる動きを表現する線, *日本バーチャルリアリティ学会論文誌*, 21, 3, 447–450.
- 2) 東知宏, 伊藤裕之, 須長正治, 妹尾武治 (2016). モーションラインによる運動の滑らかさの向上, *日本バーチャルリアリティ学会論文誌*, 21, 3, 521–524.

(c) 国際会議発表 International Conference Presentations

- 1) Tomimatsu, E., Nakajima, Y., Elliott, M. A. and Ito, H. (27 July 2016). Change, not motion, determines subjective duration, 31st International Congress of Psychology, Yokohama, Japan.
- 2) Koizumi, T., Ito, H., Sunaga, S., and Tomimatsu, E. (25 July 2016). Effect of Body Posture on the Interpretation of Cast Shadows, 31st International Congress of Psychology, Yokohama, Japan.

(d) 国内学会発表, 研究会等 Domestic Conference Presentation

- 1) 張羽豪, 伊藤裕之, 須長正治. (2017年1月19日). 奥行き順序知覚における刺激色と背景色の彩度の影響, *日本視覚学会 2017年冬季大会*.

3. 須長 正治 研究室 Shoji SUNAGA

(a) 英語学術論文・出版物 English Publications

- 1) Punsongserm, R., Sunaga, S., Ihara, H. (2017). Thai typefaces (Part 1): Assumption on visibility and legibility problems, *Archives of Design Research*, 30, 1, 5–23.
- 2) Koizumi, T., Ito, H., Sunaga, S., and Ogawa, M. (2017). Directional bias in the perception of cast shadows, *i-Perception*, 1–17.
- 3) Katsura, S., Mitsuyasu, S., and Sunaga, S. (2016). Superiority of dichromats in visual search task cued by S-cone stimulus value, *Proceedings of the International Colour Association AIC Color 2016 Santiago*, 120–123.

(b) 国際会議発表 International Conference Presentation

- 1) Koizumi, T., Ito, H., Sunaga, S., and Ogawa, M. (25 July 2016). Effect of Body Posture on the Interpretation of Cast Shadows, The 31st International Congress of Psychology, Yokohama, Japan.

(c) 国内学会発表, 研究会等 Domestic Conference Presentations

- 1) 菱川優介, 桂重仁, 須長正治 (2017年3月4日). 焼肉の色変化と美味しさ評価に基づいた2色覚の焼肉支援アプリの作成, *日本色彩学会平成28年度色覚研究会*.
- 2) 張羽豪, 伊藤裕之, 須長正治 (2017年1月21日). 奥行き順序知覚における刺激色と背景色の彩度の影響, *日本視覚学会 2017年冬季大会*.
- 3) 林恭平, 永井岳大, 川島祐貴, 山内泰樹, 須長正治 (2017年1月20日). 異常3色覚における輝度弁別とS色弁別の相対感度, *日本視覚学会 2017年冬季大会*.
- 4) 桂重仁, 菱川優介, 須長正治 (2016年11月26日). 色覚タイプによるS錐体刺激値差を手がかりとした視覚探索能の比較, *日本色彩学会平成28年度研究会大会*.

- 5) 桂重仁, 金田恵梨子, 須長正治 (2016年6月4日). 幼児教育者の色覚異常に関する意識調査と色覚特性推定のためのぬり絵図案の作成, 日本色彩学会第47回全国大会 [名古屋]'17.
- 6) 須長正治, 桂重仁, 玉野由利子, 大井手晴香, 金田恵梨子, 光安祥代 (2016年6月4日). 2色覚者の視点に立ったカラーユニバーサルデザインのための色見本帖, 日本色彩学会第47回全国大会 [名古屋]'17.

#### 4. G. B. レメイン 研究室 Gerard Bastiaan REMIJJN

##### (a) 英語学術論文・出版物 English Publications

- 1) Remijn, G. B., Kikuchi, M., Shitamichi, K., Ueno, S., Yoshimura, Y., Tsubokawa, T., Kojima, H., Higashida, H., and Minabe, Y. (2017). A NIRS study on cortical hemodynamic responses to normal and whispered speech in 3- to 7-year-old children. *Journal of Speech, Language and Hearing Research*, 60, 465–470.
- 2) Fujihira, H., Shiraishi, K., and Remijn, G. B. (2017). Elderly listeners with low intelligibility scores under reverberation show degraded subcortical representation of reverberant speech. *Neuroscience Letters*, 637, 102–107.
- 3) Yoshimura, Y., Kikuchi, M., Hiraishi, H., Hasegawa, C., Takahashi, T., Gerard Remijn, Oi, M., Munesue, T., Higashida, H., and Minabe, Y. Synchrony of auditory brain responses predicts behavioral ability to keep still in children with autism spectrum disorder. (2016). *NeuroImage: Clinical*, 12, 300–305. doi:10.1016/j.nicl.2016.07.009.
- 4) Kishida, T., Nakajima, Y., Ueda, K., and Remijn, G. B. (2016). Three factors are critical in order to synthesize intelligible noise-vocoded Japanese speech. *Frontiers in Psychology*, 7, 517. doi: 10.3389/fpsyg. 2016.00517.

##### (b) 国際会議発表 International Conference Presentations

- 1) Remijn, G. B., Yoshizawa, T., and Yano, H. (24 July 2016). Quadri-stable perception induced by a visual motion stimulus, 31st International Congress on Psychology ICP2016, Yokohama, Japan.
- 2) Fujihira, H., Shiraishi, K., Remijn, G.B. (28 November–2 December 2016). Auditory brainstem responses to anechoic and reverberant two-syllable speech sounds in elderly listeners, Presented at the 5th joint meeting of the Acoustical Society of American and Acoustical Society of Japan, The Journal of the Acoustical Society of America, 140, 3156; doi: <http://dx.doi.org/10.1121/1.4969903>, Honolulu, USA.
- 3) Ono, A., Nakajima, Y., Ueda, K., Remijn, G.B. (24–29 July 2016). The speech-to-song illusion in Japanese. *International Journal of Psychology*, 51, 821. Presented at the 31st International Congress on Psychology (ICP2016), Yokohama, Japan.
- 4) Yano, H., Nakajima, Y., Ueda, K., Remijn, G.B. (24–29 July 2016). The effect of sound on visual grouping in a multi-stable stimulus. *International Journal of Psychology*, 51, 1027. Presented at the 31st International Congress on Psychology (ICP2016), Yokohama, Japan.
- 5) Kishida, T., Nakajima, Y., Ueda, K., Remijn, G.B. (24–29 July 2016). Effects of factor elimination on intelligibility of noise-vocoded Japanese speech. *International*



Journal of Psychology, 51, 819. Presented at the 31st International Congress on Psychology (ICP2016), Yokohama, Japan.

5. 大井 尚行 研究室 Naoyuki Oi

(a) 英語学術論文・出版物 English Publication

- 1) Oi, N., and Takahashi, H. (2016). Image structure of health in daily life using Image Grid Method, *ICHES2016 The Fifth International Conference on Human-Environment System (USB 20045)*.

(b) 日本語学術論文・出版物 Japanese Publication

- 1) 田澤隼, 大井尚行 (2016). 移動を伴い変化する空間の連続評価について: 3つの手法による「圧迫感—開放感」の計測と空間の考察, 日本建築学会技術報告集, 22, 52, 1003-1006.

(c) 国際会議発表 International Conference Presentations

- 1) Oi, N., and Takahashi, H. (30 October 2016). Image structure of health in daily life using Image Grid Method, ICHES2016 The Fifth International Conference on Human-Environment System, Nagoya, Japan.
- 2) Oi, N. (29 June 2016). Attractiveness of streets in a commercial district: Cognition of space components at a corner from pedestrians' view, iaps24 (International Association for People-environment Studies), Lund, Sweden.

(d) 国内学会発表, 研究会等 Domestic Conference Presentations

- 1) 佐々木頌子, 大井尚行 (2017年3月5日). 屋内緑化の緑化形態を限定した評価構造に関する研究: 利用者の観点から魅力的な屋内緑化を目指して, 日本建築学会九州支部研究発表会.
- 2) 有馬万結, 大井尚行 (2017年3月5日). 水による演出空間に関する研究: 実体験型評価グリッド法による評価構造の抽出, 日本建築学会九州支部研究発表会.
- 3) 岡香保里, 大井尚行 (2017年3月5日). 縮尺模型を用いた壁面模様の印象評価実験の有効性に関する研究, 日本建築学会九州支部研究発表会.
- 4) 形田翔子, 大井尚行, 高橋浩伸 (2017年3月5日). 可照時間の差による日光に対する意識と採光満足度に関する研究, 日本建築学会九州支部研究発表会.
- 5) 若狭智子, 大井尚行 (2017年3月5日). 居酒屋店舗における隠れ家性に関する研究: 中の見えや立地と隠れ家性との関係について, 日本建築学会九州支部研究発表会.
- 6) 若狭智子, 大井尚行 (2016年8月26日). 居酒屋店舗における隠れ家性に関する研究: 評価グリッド法を用いた評価構造の抽出と分析, 日本建築学会大会.
- 7) 岡香保里, 大井尚行 (2016年8月24日). 縞模様の壁面が与える心理的影響に関する研究, 日本建築学会大会.
- 8) 植田征道, 大井尚行, 高橋浩伸 (2016年8月24日). 居住地と非居住者による町並み景観構成要素の認識: キャプション評価法を用いた玉名市高瀬地区での調査, 日本建築学会大会.
- 9) 佐々木頌子, 大井尚行 (2016年8月26日). 商業施設における屋内緑化の評価構造に関する研究: 利用者の観点から魅力的な屋内緑化を目指して, 日本建築学会大会.
- 10) 形田翔子, 大井尚行, 高橋浩伸 (2016年8月24日). 日光に対する意識と自然光の取り入れ方に関する研究, 日本建築学会大会.

## (e) 学会大会・会議・シンポジウムなどにおける役割 Leading Roles in Conferences

- 1) 電気・情報関係学会九州支部連合大会, 大会副委員長 (2016年9月29日-30日).
- 2) 照明学会100周年記念シンポジウム・式典・祝賀会, 実行委員会委員 (2016年9月2日).
- 3) 日本建築学会大会, 実行委員会委員, 広報部会幹事 (2016年8月24日-26日).

## 6. 冬野 美晴 研究室 Miharu FUYUNO

## (a) 英語学術論文・出版物 English Publications

- 1) Fuyuno, M. (2017). An investigation into the influence of domestic and foreign cosmetics Advertisements in Thailand: Evaluation of subjective impression by SD method, *Linguistic Science*, 52, 47-59.
- 2) Liu, S., Nakajima, Y., Yamashita, Y., and Fuyuno, M. (2017). Quantitative analysis of English public speaking presented by Japanese EFL learners, *Statistical Analysis of Public Speech Behavior and Acoustic Features: Multimodal Corpus Based Approach*, 17-36.
- 3) Komiya, R., Saitoh, T., Fuyuno, M., Yamashita, Y., and Nakajima, Y. (2017). Head pose estimation and motion analysis of public speaking videos, *International Journal of Software Innovation*, 5, 1, 57-71.
- 4) Fuyuno, M., Yamashita, Y., Saitoh, T., and Nakajima, Y. (2016). Semantic structure, speech units and facial movements: Multimodal corpus analysis of English public speaking, *EPiC Series in Language and Linguistics*, 1, 447.
- 5) Blanco, L. M. C., and Fuyuno, M. (2016). Development of an interactive multimedia Spanish learning application with a focus on authentic material, *Proc. of SAI Joint International Conference*.
- 6) Komiya, R., Saitoh, T., Fuyuno, M., Yamashita, Y., and Nakajima, Y. (2016). Head pose estimation and movement analysis for speech scene, *Proc. of 15th IEEE/ACIS International Conference on Computer and Information Science*, 409-413.
- 7) Fuyuno, M. (2016). Rote Learning in English Education for Japanese Students : towards more Context-Oriented Multimedia Material (招待採録), *Collected articles on the English language*, 48.
- 8) Fuyuno, M. (2016). Comparative analyses of Japanese learners' self-evaluation and judges' evaluation of English public speaking : Identifying primary targets for practical teaching of multimodal speaking skills (招待採録), *Collected articles on the English language*.

## (b) 日本語学術論文・出版物 Japanese Publications

- 1) 冬野美晴, 他 (2017). 英語学習のための特選映画100選 (井土康仁・寶壺貴之編), 株式会社フォーイン.
- 2) 山下友子, 冬野美晴, 横森大輔, 中島祥好 (2017). 英語プレゼンテーションにおける発話時間長とポーズ時間長の定量的分析, マルチモーダルコーパスデータに基づくパブリックスピーチの統計的解析, 37-60.
- 3) 冬野美晴, 山下友子 (2017). 英語パブリックスピーキングにおける音声ポーズパターンとアイコンタクト動作パターンがパフォーマンスの総合評価へ及ぼす影響に関する統計的考察, マルチモーダルコーパスデータに基づくパブリックスピーチの統計的解析, 1-15.

- 4) 小宮凜子, ワラポン・チンサティ, 齊藤剛史, 冬野美晴 (2017). スピーチ指導のための映像情報を用いた話者の顔解析, *DIA2017*, 195–200.
- 5) 冬野美晴, 山田祐樹 (2017). スピーチ訓練のためのバーチャルオーディエンスの開発と検証, *日本教育メディア学会*, 30–31.

(c) 国際会議発表 International Conference Presentations

- 1) Fuyuno, M., Blanco, L. M. C. (6 August 2016). Development of a multimedia Spanish language learning application: based on ADDIE model and Unity 3D platform, 56th National Conference of Language Education and Technology, Tokyo, Japan.
- 2) Fuyuno, M., Yamada, Y., Yamashita, Y., and Nakajima, Y. (25 July 2016). Developing effective instructions to decrease Japanese speaker's nervousness during English and Japanese public speeches: Evidence from psychological and physiological measurements, 31st International Congress of Psychology 2016 (ICP2016), Yokohama, Japan.
- 3) Yamashita, Y., Fuyuno, M., Nakajima, Y., Antonijevic-Elliott, S., and Elliott, M. (28 July 2016). Speech pauses of public-speaking performances by Irish native English speakers, 31st International Congress of Psychology 2016 (ICP2016), Yokohama, Japan.
- 4) Fuyuno, M., Yamashita, Y., Saitoh, T., and Nakajima, Y. (25 July 2016). Multimodal Corpus Approach to Speech Psychology: The Effect of Public Speakers' Facial Movements on Audience Reception, 31st International Congress of Psychology 2016 (ICP2016), Yokohama, Japan.

(d) 国内学会発表, 研究会等 Domestic Conference Presentations

- 1) 山下友子, 冬野美晴, 横森大輔 (2016年7月9日). 日本人大学生の英語プレゼンテーションにおける効果的な間の取り方, 日本認知科学会研究分科会「間合い—時空間インタラクション」.

7. 飛松 省三 研究室 Shozo TOBIMATSU

(a) 英語学術論文・出版物 English Publications

- 1) Yamasaki, T., Maekawa, T., Miyanaga, Y., Takahashi, K., Takamiya, N., Ogata, K., Tobimatsu, S. (2017). Enhanced fine-form perception does not contribute to gestalt face perception in autism spectrum disorder, *PLoS ONE*, 12, 2.
- 2) Ohki, T., Gunji, A., Takei, Y., Takahashi, H., Kaneko, Y., Kita, Y., Hironaga, N., Tobimatsu, S., Kamio, Y., Hanakawa, T., Ikenaga, M., and Hiraki, K. (2016). Neural oscillations in the temporal pole for a temporally congruent audio-visual speech detection task, *SCIENTIFIC REPORTS*, 6.
- 3) Kikuchi, Y., Kikuchi, Y., Okamoto, T., Ogata, K., Hagiwara, K., Umezaki, T., Kenjo, M., Nakagawa, T., Tobimatsu, S., Ogata, K., Hagiwara, K., Umezaki, T., Masamutsu, K., Nakagawa, T., and Tobimatsu, S. (2017). Abnormal auditory synchronization in stuttering: A magnetoencephalographic study, *HEARING RESEARCH*, 344, 82–89.
- 4) Nakazono, H., Kuroda, T., Ogata, K., and Tobimatsu, S. (2016). Phase and Frequency-Dependent Effects of Transcranial Alternating Current Stimulation on Motor Cortical Excitability, *PLOS ONE*, 11, 9.

- 5) Nagaike, A., Mitsudo, T., Nakajima, Y., Ogata, K., Yamasaki, T., Goto, Y., and Tobimatsu, S. (2016). 'Time-shrinking perception' in the visual system: A psychophysical and high-density ERP study., *Experimental Brain Research*, 234, 11, 3279–3290.
  - 6) Kuroda, T., Grondin, S., Ogata, K., and Tobimatsu, S. (2016). The kappa effect with only two visual markers, *Multisensory Research*.
- (b) 日本語学術論文・出版物 Japanese Publications
- 1) 飛松省三 (2016). ここが知りたい!, 臨床神経生理, 中外医学社, 226 頁.
  - 2) 飛松省三 (2016). ここに目をつける!, 脳波判読ナビ, 南山堂, 180 頁.
  - 3) 谷岡洸介, 人見健文, 松本理器, 高橋良輔, 飛松省三, 犬塚 貴, 吉良潤一, 楠 進, 池田昭夫 (2017). 日本神経学会における脳波判読セミナー受講謝のアンケート調査: 脳波教育の過去 5 年間の実態, ニースおよびその変遷.
- (c) 国内学会発表, 研究会等 Domestic Conference Presentations
- 1) 飛松省三 (2016 年 12 月 21 日). 成人脳波判読の pitfalls, 第 12 回沖縄てんかん研究会.
  - 2) 飛松省三 (2016 年 12 月 21 日). 脳波の歴史 2: ハンスベルガーの前と後, 第 501 回福岡臨床と脳波懇話会.
  - 3) 飛松省三 (2016 年 10 月 28 日). 神経疾患における脳の振動, 第 46 回日本臨床神経生理学会.
  - 4) 飛松省三 (2016 年 9 月 15 日). てんかんと脳波, 平成 28 年度統計数理研究所共同利用共同研究集会, 動的生体情報論の現状と展望 2.
  - 5) 飛松省三, 緒方勝也, 中藪寿人 (2016 年 9 月 8 日). Ongoing EEG oscillations modulate MEP amplitudes: A possible mechanism of MEP variability, 6th International Conference on Transcranial magnetic stimulation.
  - 6) 飛松省三 (2016 年 8 月 21 日). 成人脳波の pitfalls, 第 28 回臨床神経生理研究会.
  - 7) 飛松省三 (2016 年 12 月 20 日). 脳波から何を学び、何を伝えるのか, 第 28 回臨床神経生理研究会.
  - 8) 飛松省三 (2016 年 8 月 6 日). 脳波の歴史, 第 2 回脳波セミナー・アドバンスコース.
  - 9) 飛松省三 (2016 年 6 月 5 日). 脳波の歴史: ハンスベルガーの業績を中心に, 第 496 回福岡臨床と脳波懇話会.
  - 10) 飛松省三 (2016 年 12 月 21 日). Hands-on 「脳波」, 第 13 回日本神経学会生涯教育セミナー.

## 8. 橋彌 和秀 研究室 Kazuhide HASHIYA

### (a) 英語学術論文・出版物 English Publication

- 1) Meng, X., Uto, Y., and Hashiya, K. (2017). Observing third-party attentional relationships affects infants' gaze following: An eye-tracking study, *Front., Psychol.*, Vol.7.

### (b) 国際会議発表 International Conference Presentations

- 1) Hashiya, K., Meng, X., and Ishikawa, K. (July 2016). The developmental change of moral judgment for the case of collective action., 31st International Congress of Psychology, Yokohama, Japan.

- 2) Hashiya, K., Meng, X., and Uto, Y. (July 2016). Expectations about third-party joint interactions in infancy, 31st International Congress of Psychology, Yokohama, Japan.
- 3) Hashiya, K., Meng, X., and Murakami, T. (July 2016). Cross-linguistic comparison of interpretation of ambiguous utterances in Japanese and Chinese children., 31st International Congress of Psychology, Yokohama, Japan.
- 4) Hashiya, K., Uto, Y., and Maruta, M. (July 2016) Communication goes multimodal: effect of different interjections on intention inference of the interaction in visual modality., 31st International Congress of Psychology, Yokohama, Japan.
- 5) Hashiya, K., and Maeyama, K. (July 2016). Possible factors forming in-group preference in 3-4 year old children: through the looking preference studies., 31st International Congress of Psychology, Yokohama, Japan.
- 6) Hashiya, K. (July 2016). Involuntary facial mimicry in ASD / TD children: an EMG study with static / morphing facial stimuli., 31st International Congress of Psychology, Yokohama, Japan.
- 7) Hashiya, K., Kobayashi, H., Norimatsu, Hand., Blin, R. (July 2016). Christine Sorsana, ToM ability tested with the “disambiguation task” in French & Japanese children aged 16-38 months., 31st International Congress of Psychology, Yokohama, Japan.
- 8) Hashiya, K., Kobayashi, H., Ikeda, K., and Saito, A. (July 2016). Developmental changes of perceived cuteness in various species: from an altricial-precocial perspective., 31st International Congress of Psychology, Yokohama, Japan.
- 9) Hashiya, K., Hasegawa, T., Uto, Y., Meng, X. Kobayashi, H., Maeyama, K., Osanai, H., Hakarino, K., Tojyo, Y., and Saito, A. (January 2017). Developmental origin of involuntary facial mimicry: studies of infants, and children with/without ASD., 2017 Budapest CEU Conference on Cognitive Development, Budapest, Hungary.
- 10) Hashiya K., and Kishimoto, R. (January 2017). Children avoid “calculated” helpers based on third-party observation: the “peeking” experiment., 2017 Budapest CEU Conference on Cognitive Development, Budapest, Hungary.
- 11) Hashiya, K. (April 2016). Communication, in Relation to Empathetic Systems, NEW PERSPECTIVES ON OSTENSIVE COMMUNICATION (Prof. Dan Sperber), Tokyo, Japan.

(c) 国内学会発表, 研究会等 Domestic Conference Presentations

- 1) 橋彌和秀. (2017年3月11日). 共感という心的バイアス: コミュニケーションの基盤としての機能を考える, 会話を通じた相互信頼感形成の共関心分析とコミュニケーション支援の研究 (主催).
- 2) 橋彌和秀, 宇土裕亮, 前山航輝, 孟憲巍, 小林洋美, 長内博雄, 計野浩一郎, 東條吉邦, 斎藤慈子, 長谷川寿一. (2016年4月). ASD児・TD児における動画および静止画に対する「自動的」表情模倣, 日本発達心理学会第27回大会.
- 3) 橋彌和秀, 宇土裕亮, 丸田弥音. (2016年4月). 幼児における他者の感嘆詞にもとづいた意図推論の発達, 日本発達心理学会第27回大会.
- 4) 橋彌和秀, 宇土裕亮, 孟憲巍. (2016年4月). 0-1歳児における他者間のインタラクションに関する期待, 日本発達心理学会第27回大会.

- 5) 橋彌和秀, 前山航暉. (2016年5月). 幼児にとっての「内集団」:3, 4歳児の二者間の競合場面に対する注視行動の分析から, 日本赤ちゃん学会第16回学術集会.
- 6) 橋彌和秀, 山手秋穂, 若藤礼子. (2016年5月). 因果応報的ストーリーへの期待とその発達, 日本赤ちゃん学会第16回学術集会.
- 7) 橋彌和秀, 宇土裕亮. (2016年5月). 他者同士のやりとりを乳児はどのように見ているかー乳児の注視パターンに注目してー, 日本赤ちゃん学会第16回学術集会.
- 8) 橋彌和秀, 宇土裕亮. (2016年5月). 他者への意図帰属に感嘆詞が及ぼす効果とその発達, 日本赤ちゃん学会第16回学術集会.
- 9) 橋彌和秀. (2016年5月). 「わたしたち」は「わたし」の先にあるのか? 「われわれからわたし、わたしからわれわれーわれわれ感の起源の学際的研究ー」, 日本赤ちゃん学会第16回学術集会.
- 10) 橋彌和秀, 孟憲巍. (2016年12月). 1歳半児が示す自他の知識・知覚状態の差異への感受性: 一人称および三人称的視点からの検討, 日本人間行動進化学会第9回大会.
- 11) 橋彌和秀, 孟憲巍. (2017年1月). 認知的共感の初期発達: 1歳半児が示す自他・他者間の心的状態の差異への感受性, 新学術領域研究「共感性の進化・神経基盤」第4回領域会議.
- 12) 橋彌和秀, 宇土裕亮. (2017年1月). 他者の心的状態の手がかりとしての感嘆詞: 成人および幼児の意図推論における感嘆詞の利用, 新学術領域研究「共感性の進化・神経基盤」第4回領域会議.
- 13) 橋彌和秀. (2017年1月). 発達から見た一人称的共感と三人称的共感: 統合的視点の探索, 新学術領域研究「共感性の進化・神経基盤」第4回領域会議.
- 14) 橋彌和秀, 孟憲巍, 宇土裕亮. (2017年1月). 1歳半児が示す自他の知識・知覚状態の差異への感受性ー三人称的視点からの検討ー, ヒューマンコミュニケーション基礎研究会.
- 15) 橋彌和秀, 孟憲巍. (2017年3月). 他者理解に基づく協力行動の初期発達ー1歳半児の指差しと注視行動を指標としてー, 日本発達心理学会第28回大会.
- 16) 橋彌和秀. (2017年3月). 「教え」と「教わる」のあいだ, 会員企画ラウンドテーブル「教え・教わるこころの起源を探るー情報伝達の発達に関する実験的考察ー」, 日本発達心理学会第28回大会.
- 17) 橋彌和秀. (2017年3月). 「合う」を検出するこころの適応的意味, 会員企画ラウンドテーブル「「合う」こころの意味を考えるーリズム、発達、コミュニケーションの理解に向けてー」, 日本発達心理学会第28回大会.
- 18) 橋彌和秀, 宇土裕亮, 丸田弥音 (2016年4月). 幼児における他者の感嘆詞にもとづいた意図推論の発達, 日本発達心理学会第27回大会.

## 9. 山本 健太郎 研究室 Kentaro YAMAMOTO

### (a) 英語学術論文・出版物 English Publication

- 1) Yamamoto, K., and Miura, K. (2016). Effect of motion coherence on time perception relates to perceived speed, *Vision Research*, 123, 56–62.

### (b) 国内学会発表, 研究会等 Domestic Conference Presentations

- 1) 山本 健太郎 (2017年3月5日). 行為に伴う感覚結果の知覚タイミング: 出現位置・行為対象の影響, 第50回知覚コロキウム.
- 2) 上田大志, 山本 健太郎, 渡邊克巳 (2016年10月29日). 大局的・局所的な身体運動情報による速度知覚の変容, 日本基礎心理学会第35回大会.

- 3) 山本健太郎, 田中観自, 渡邊克巳 (2016年6月19日). 出来事の認知度が日付の印象に及ぼす影響, 日本認知心理学会第14回大会.

## 4.2 応用知覚学グループ Applied Perceptual Research Group

### 1. 高木 英行 研究室 Hideyuki TAKAGI

#### (a) 英語学術論文・出版物 English Publication

- 1) Yan, P., and Takagi, H. (2017). Local fitness landscape from paired comparison-based memetic search in interactive differential evolution and differential evolution, *Int. J. Ad Hoc and Ubiquitous Computing*, vol.25, no.s 1/2, 17–30.

#### (b) 国際会議発表 International Conference Presentation

- 1) Yu, J., Yan, P., and Takagi, H. (24–29 July 2016). Accelerating Evolutionary Computation Using Estimated Convergence Point, IEEE Congress on Evolutionary Computation (CEC2016), Vancouver, Canada, 1438–1444.

#### (c) 国内学会発表, 研究会等 Domestic Conference Presentations

- 1) 余俊, 高木英行 (2017年3月13–14日). 個体間距離順位とフィットネス順位に基づく局所解領域の推定, 第12回進化計算学会研究会, 福岡, 203–206.
- 2) 井上誠, 裴岩, 高木英行 (2017年3月3–14日). 多数目的最適化を目指した設計受容度: 静粛超音速研究機をタスクとして, 第12回進化計算学会研究会, 福岡, 81–88.
- 3) 余俊, 高木英行 (2016年12月10–11日). 局所個体群の fitness に基づく fitness 景観の勾配推定を導入した花火アルゴリズム, 進化計算シンポジウム 2016, 長生郡一宮町, 131–137.
- 4) 井上誠, 高橋瑞稀, 裴岩, 高木英行 (2016年9月14–15日). 受容度に基づく多数目的探索のお部屋探し, 第11回進化計算研究会, 神戸, 183–199.
- 5) 大西圭, 栗栖万理子, 佐藤太河, 高木英行 (2016年8月31日–9月2日). 協調型インタラクティブ進化計算実行チームの形成支援システム, 第32回ファジィシステムシンポジウム, 佐賀, 231–236.
- 6) 池田啓介, 高木英行 (2016年8月31日). ニューラルネットワークを用いた気づき支援システムに関する研究, 第32回ファジィシステムシンポジウム, 佐賀, 479–482.

#### (d) 学会大会・会議・シンポジウムなどにおける役割 Leading Roles in Conferences

- 1) 第12回進化計算研究会, 実行委員長 (2017年3月13日–14日).
- 2) 16th Int. Conf. on Intelligent Systems Design and Applications (ISDA'16), International Advisory Board Member (2016年12月14日–16日).
- 3) 6th World Congress on Information and Information Technology (WICT'16), International Advisory Board Member (2016年12月14日–16日).
- 4) 8th Int. Conf. on Nature and Biologically Inspired Computing (NaBIC'16), Advisory Board Member (2016年11月21日–23日).
- 5) 16th Int. Conf. on Hybrid Intelligent Systems (HIS'16), International Advisory Board Member (2016年11月21日–23日).
- 6) 7th Int. Conf. on Innovations in Bio-Inspired Computing and Applications (IBICA2016), International Advisory Board Member (2016年11月17日–20日).

- 7) 12th Int. Conf. on Information Assurance and Security (IAS2016), International Advisory Board Member (2016年11月17日-20日).
- 8) IEEE International Conference on Systems, Man, and Cybernetics (SMC2016), Special Sessions Chair (2016年10月9日-12日).
- 9) Joint 8th Int. Conf. on Soft Computing and Intelligent Systems and 17th Int. Symposium on Advanced Intelligent Systems (SCIS & ISIS 2016), Advisory Committee Member (2016年8月22日-25日).
- 10) 5th Int. Conf. on Frontier Computing (FC 2016), Keynote Speakers (2016年7月13日-15日).
- 11) 7th Int. Conf. on Swarm Intelligence (ICSI 2016), Technical Committee co-Chair (2016年6月25日-30日).
- 12) 1st Int. Conf. on Data Mining and Big Data (DMBD 2016), Technical Committee co-Chair (2016年6月25日-30日).

## 2. 上田 和夫 研究室 Kazuo UEDA

### (a) 英語学術論文・出版物 English Publications

- 1) Ueda, K., and Nakajima, Y. (2017). An acoustic key to eight languages/dialects: Factor analyses of critical-band-filtered speech, *Scientific Reports*, 7, 42468, doi: 10.1038/srep42468.
- 2) Kishida, T., Nakajima, Y., Ueda, K., and Remijn, G. B. (2016). Three factors are critical in order to synthesize intelligible noise-vocoded Japanese speech, *Front. Psychol.*, 26 April 2016, 7, 517.

### (b) 国際会議発表 International Conference Presentations

- 1) Ueda, K., Nakajima, Y., Ellermeier, W., and Kattner, F. (22 August 2016). Intelligibility of locally time-reversed speech in four languages: Chinese, English, German, and Japanese, The 29th Perceptual Frontier Seminar: Poster Symposium in Summer.
- 2) Kishida, T., Nakajima, Y., Ueda, K., and Remijn, G. B. (28 July 2016). Effects of factor elimination on intelligibility of noise-vocoded Japanese speech, The 31st International Congress of Psychology 2016 (ICP2016), Yokohama, Japan.
- 3) Yano, H., Nakajima, Y., Ueda, K., and Remijn, G. B. (27 July 2016). The effect of sound on visual grouping in a multi-stable stimulus, The 31st International Congress of Psychology 2016 (ICP2016), Yokohama, Japan.
- 4) Ueda, K., Nakajima, Y., Tamura, S., Shichida, A., Ellermeier, W. Kattner, F. Daebler, S., and Neo, N. N. (26 July 2016). Intelligibility of locally time-reversed speech in Chinese, English, German, and Japanese, The 31st International Congress of Psychology 2016 (ICP2016), Yokohama, Japan.
- 5) Ono, A., Nakajima, Y., Ueda, K., and Remijn, G. B. (25 July 2016). The speech-to-song illusion in Japanese, The 31st International Congress of Psychology 2016 (ICP2016), Yokohama, Japan.
- 6) Iida, K., Nakajima, Y., Ueda, K., Remijn, G. B., and Serizawa, Y. (5 July 2016). Effects of the duration and the frequency of temporal gaps on the subjective



distortedness of music fragments, ICMPC14, the 14th International Conference for Music Perception and Cognition, San Francisco, USA.

- 7) Ueda, K., Nakajima, Y., Ellermeier, W. Kattner, F. (20 May 2016). A multilingual comparison of intelligibility in locally time-reversed speech, 日本音響学会聴覚研究会.

(c) 国内学会発表, 研究会等 Domestic Conference Presentations

- 1) Ueda, K., Nakajima, Y., Ellermeier, W. Kattner, F. (17 March 2017). Intelligibility of locally time-reversed speech: A multilingual comparison with normalizing speech rates, 日本音響学会春季研究発表会.
- 2) 岸田拓也, 中島祥好, 上田和夫, Gerard B. Remijn, 中尾貫志 (2017年3月27日). 臨界帯域パワー変動因子を用いた雑音駆動音声の合成: 因子の除去が明瞭度に与える効果, 日本音響学会聴覚研究会.
- 3) 仲田愛子, 上田和夫, Gerard B. Remijn, 中島祥好 (2016年12月18日). モザイク処理した刺激における音声と雑音の分離, 日本音響学会聴覚研究会.
- 4) 小野明日香, 中島祥好, 上田和夫, Gerard B. Remijn (2016年12月17日). 日本語における歌化錯覚, 日本音響学会聴覚研究会.

(d) 学会大会・会議・シンポジウムなどにおける役割 Leading Roles in Conferences

- 1) The Auditory Research Meeting, Organizer, 現地世話人 (2016年12月17日-18日).
- 2) The 31st International Congress of Psychology, プログラム委員 (2016年7月24日-29日).
- 3) 日本音楽知覚認知学会平成28年度春季研究発表会, 研究選奨選考委員会委員 (2016年5月14日-15日).

3. 鏑木 時彦 研究室 Tokihiko KABURAGI

(a) 英語学術論文・出版物 English Publications

- 1) Uchida, H., Wakamiya, K., and Kaburagi, T. (2016). Improvement of measurement accuracy for the three-dimensional electromagnetic articulograph by optimizing the alignment of the transmitter coils, *Acoustical Science and Technology*, 37, 3, 106–114.
- 2) Uezu, Y., and Kaburagi, T. (2016). A measurement study on voice instabilities during modal-falsetto register transition, *Acoustical Science and Technology*, 37, 6, 267–276.

(b) 国際会議発表 International Conference Presentations

- 1) Kaburagi, T. (4 February 2017). Synergistic interactions underlying the production of human voice, Youngnam-Kyushu Joint Conference on Acoustics 2017, Busan, Korea.
- 2) Okada, M., and Kaburagi, T. (4 February 2017). Higher-order frequency locking of an organ pipe: A theoretical and experimental study, Youngnam-Kyushu Joint Conference on Acoustics 2017, Busan, Korea.
- 3) Wakamiya, K., Uchida, H., and Kaburagi, T. (4 February 2017). An investigation of the alignment of the transmitter coils in the three-dimensional electromagnetic articulography having eight transmission channels, Youngnam-Kyushu Joint Conference on Acoustics 2017, Busan, Korea.
- 4) Okada, M., and Kaburagi, T. (2 December 2016). Higher-order frequency locking of an organ pipe, Joint Meeting of Acoustical Society of America and Acoustical Society of Japan, Hawaii, USA.

- 5) Uezu, Y., and Kaburagi. (2 December 2016). A measurement study on voice instabilities during the register transition, Joint Meeting of Acoustical Society of America and Acoustical Society of Japan, Hawaii, USA.

(c) 国内学会発表, 研究会等 Domestic Conference Presentations

- 1) 上江洲安史, 鐫木時彦 (2017年3月18日). 琉球古典音楽(野村流)の歌唱技法による歌声の特徴分析, 日本音響学会, 音楽音響研究会.
- 2) 岩見健一, 鐫木時彦 (2017年1月7日). リード木管楽器演奏時に声道が与える影響についての数値的検討, 日本音響学会, 音楽音響研究会.
- 3) 鐫木時彦, 清水拓磨 (2016年9月15日). 口笛吹鳴時の声道音響特性の解析, 日本音響学会秋季研究発表会.
- 4) 若宮幸平, 内田秀継, 鐫木時彦 (2016年9月15日). 8個の送信チャンネルを持つ磁気センサシステムの検討, 日本音響学会秋季研究発表会.
- 5) 上江洲安史, 鐫木時彦 (2016年9月15日). 琉球古典音楽(野村流)の歌唱技法による歌声の音響分析: うちぐい, 當の場合, 日本音響学会秋季研究発表会.
- 6) 岡田昌大, 鐫木時彦 (2016年9月14日). オルガンパイプにおける位相感受関数の測定, 日本音響学会秋季研究発表会.
- 7) 岡田昌大, 鐫木時彦 (2016年6月13日). オルガンパイプにおける高次同期についての研究, 電子情報通信学会 非線形問題研究会.

4. 上岡 玲子 研究室 Ryoko UEOKA

(a) 国際会議発表 International Conference Presentations

- 1) Ueoka, R., AlMutawa, A., Katsuki, H. (6 December 2016). Emotion hacking VR (EH-VR): amplifying scary VR experience by accelerating real heart rate using false vibrotactile biofeedback, SIGGRAPH ASIA 2016, Article No.7, Macao, China.
- 2) Ueoka, R., Yamaguchi, M., and Sato, Y. (9 May 2016). Interactive cheek haptic display with air vortex rings for stress modification, CHI 2016, pp. 1766-1771, San Jose, CA, USA.

(b) 国内学会発表, 研究会等 Domestic Conference Presentations

- 1) 中川万莉奈, 上岡玲子 (2016年9月15日). 背部触覚刺激による自発的姿勢矯正システムの改良と評価方法の検討, 第21回日本バーチャルリアリティ学会大会, 21F-05.
- 2) 島崎郁花, 上岡玲子 (2016年9月15日). テキスタイルセンサを用いた腹巻き型笑いログシステムの検討, 第21回日本バーチャルリアリティ学会大会, 21B-02.
- 3) 佐藤優花, 上岡玲子 (2016年9月14日). 渦輪利用した頬触覚インタフェースによる人の生理反応とタスクパフォーマンスの計測と評価, 第21回日本バーチャルリアリティ学会大会, 12C-05.

(c) 学会大会・会議・シンポジウムなどにおける役割 Leading Role in Conference

- 1) Siggraph Asia 2016, Emerging Technology Program Committee (2016年12月5日-8日).

5. 妹尾 武治 研究室 Takeharu SENO

(a) 英語学術論文・出版物 English Publications

- 1) Ohtsuka, S., Ono, F. and Seno, T. (2016). Mindfulness can modulate vection strength. *International Journal of Affective Engineering*.
  - 2) Valjamae, A. and Seno, T. (2016). Modulation of recognition memory of emotional images by vertical vection. *Frontiers in Psychology*, 7, 39.
  - 3) Ogawa, M., and Seno T. (2016). Vection strength can be socially modulated through conformity to the reported perception of others, *Transactions of the Virtual Reality Society of Japan*, Vol.21, No.1, 23–30.
  - 4) Seno, T., and Yoshinaga, T. (2016). A new vection stimulus: Immerse yourself in vection, *Transactions of the Virtual Reality Society of Japan*, Vol.21, No.1, 193–196.
  - 5) Ogawa, M., and Seno, T. (2016). Colorful stimuli might inhibit vection, *Transactions of the Virtual Reality Society of Japan*, Vol.21, No.1, 31–34.
- (b) 日本語学術論文・出版物 Japanese Publications
- 1) 妹尾武治 (2016). 『使ってはいけないエセ心理学 使ってもいい心理学』, PHP 研究所, 単行本 (ソフトカバー), 251 ページ.
  - 2) 妹尾武治 (2016). 『脳は、なぜあなたをだますのか: 知覚心理学入門』, ちくま新書, 新書 213 ページ.
  - 3) 東知宏, 伊藤裕之, 須長正治, 妹尾武治 (2016). モーションラインによる運動の滑らかさの向上, 日本バーチャルリアリティ学会論文誌, Vol.21, No.3, 521–524.
  - 4) 妹尾武治, 小川将樹, 徳永康祐, 金谷英俊 (2016). 「コップ水法」によるベクションの促進. 日本バーチャルリアリティ学会論文誌, Vol.21, No.3, 411–414.
  - 5) 徳永康祐, 小川将樹, 池畑諭, 増田知尋, 妹尾武治 (2016). 映画、アニメ中のベクションシーンのデータベースの作成と、心理実験による評価, 日本バーチャルリアリティ学会論文誌 Vol.21, No.1, 35–48.
  - 6) 妹尾武治, 永田喜子 (2016). 没入傾向とベクション強度は相関するか? 没入感に関する挑戦的研究, 日本バーチャルリアリティ学会論文誌, Vol.21, No.1.
  - 7) 妹尾武治 (2016). ベクションとその周辺の近年の動向, 認知科学, 21, 4, 523–530, 日本認知科学会.
- (c) 国際会議発表 International Conference Presentations
- 1) Setoguchi, E., and Seno T. (26–27 August 2016). Making demo movies of introduction of various vection studies, The Visual Science of Art Conference, Barcelona, Spain.
  - 2) Seno, T., Palmisano, S., and Nakamura, S. (26–27 August 2016). Effects of prior walking context on the vection induced by different types of global optic flow. The Visual Science of Art Conference, Barcelona, Spain.
  - 3) Seno, T., Sawai, K., Ogawa, M., Wakebe, T., Kanaya, H., Kim, J., and Palmisano, S. (1 September 2016). Construction of a model of vection. The European Conference on Visual Perception 2016, Barcelona, Spain.
  - 4) Setoguchi, E., and Seno, T. (1 September 2016). A new bias in repeated serial subjective estimation: Vection in a contest of Japanese comedians, The European Conference on Visual Perception 2016, Barcelona, Spain.
  - 5) Seno, T. and Nagata, Y. (24–29 July 2016). The significant positive correlation between the strength of vection (illusory self-motion perception) and sense of immersion, ICP2016, Yokohama, Japan.

- 6) Ogawa, M., Seno, T., Ito, H. and Okajima, K. (24–29 July 2016). Vection strength is determined by the subjective size of a visual stimulus modulated by amodal completion, ICP2016, Yokohama, Japan.

(d) 国内学会発表, 研究会等 Domestic Conference Presentations

- 1) 妹尾武治 (2016年11月23日). 脳は、なぜあなたをだますのか? 龍谷大学, 「特別講義」.
- 2) Seno, T. Shirai, N., Sato, H., and Valjamae, A. (2016年12月17日). The correlation between visually and auditorily induced vection magnitude and latency might suggest the same basic mechanism for self-motion perception, 聴覚研究会 (H).
- 3) 徳永康祐, 妹尾武治, 藤井芳孝, 小川将樹, 池畑諭, 増田知尋 (2016年11月). アニメ業界にベクションを浸透させる試み, VR心理学研究委員会, 愛知, 名古屋.
- 4) 妹尾武治, 吉永崇, 宮地尚希, 藤井芳孝 (2016年11月). VR地震という試みについて, VR心理学研究委員会, 愛知, 名古屋.
- 5) 瀬戸口笑, 妹尾武治, 藤井芳孝 (2016年11月). 科学論文に基づいたベクション動画作成の試み, VR心理学研究委員会, 愛知, 名古屋.
- 6) 藤井芳孝, 妹尾武治 (2016年11月). 斜め運動刺激によるベクション, VR心理学研究委員会, 愛知, 名古屋.
- 7) 小川将樹, 妹尾武治, 伊藤裕之, 岡嶋克典 (2016年11月). ベクションにおけるアモーダル補完による知覚的刺激サイズの変調と奥行の影響, VR心理学研究委員会, 愛知, 名古屋.
- 8) 原清志郎, 玉田靖明, 藤井芳孝, 妹尾武治, 佐藤雅之 (2016年11月). 足裏振動が視覚誘導性自己運動感覚におよぼす影響, VR心理学研究委員会, 愛知, 名古屋.

6. 志堂寺 和則 研究室 Kazunori SHIDOJI

(a) 日本語学術論文・出版物 Japanese Publications

- 1) 内海章, 多田昌裕, 松尾典義, 鳥居武史, 志堂寺和則 (2016). 運転者の状態認知と周囲への提示による運転状態の見える化, 技術情報協会編, ドライバ状態の検出, 推定技術と自動運転, 運転支援システムへの応用, pp. 325–332, 技術情報協会.
- 2) 隅田康明, 松永勝也, 合志和晃, 志堂寺和則 (2016). 車輪付き手動移動体の走行負荷に基づく歩道の評価方法, 情報処理学会論文誌, 57, 7, 1652–1662.
- 3) 志堂寺和則 (2017). 眼球情報の計測とそこからわかる人の心理, 情報機構編, 製品開発のための生体情報の計測手法と活用ノウハウ: 脳計測・生理計測に基づく客観的な感性評価を商品へ活かす, pp. 66–71, 情報機構.

(b) 国際会議発表 International Conference Presentation

- 1) SHIDOJI, K., and YOSHIHARA, T. (28 July 2016). Development of a simulator-based driving test to assess drivers' performance, 31st International Congress of Psychology, Yokohama, Japan.

(c) 国内学会発表, 研究会等 Domestic Conference Presentations

- 1) 福田 恭介, 志堂寺 和則, 松尾 太加志, 早見 武人 (2016年12月3日). Go, No-Go 課題中における発達障害児の瞬目変動, 九州心理学会第77回大会.
- 2) 鈴木 梓, 福田 恭介, 志堂寺 和則, 早見 武人, 松尾 太加志 (2016年12月3日). ワーキングメモリ課題中における瞬目変動, 九州心理学会第77回大会.

- 3) 井手学, 志堂寺和則 (2017年2月20日). ドライビングシミュレータにおける視線解析システムの開発, 電子情報通信学会 ITS 研究会, 北海道. (電子情報通信学会技術研究報告, Vol. 116, No. 463, ITS2016-68, pp. 371–374).
- 4) 志堂寺和則 (2016年4月2日). 運転適性, 日本交通心理学会交通心理士試験事前講習会.
- 5) 志堂寺和則 (2016年9月10日). 運転適性, 日本交通心理学会交通心理士試験事前講習会.

## 7. 光藤 宏行 研究室 Hiroyuki MITSUDO

### (a) 英語学術論文・出版物 English Publication

- 1) Qian, K., and Mitsudo, H. (2016). Eggs illusion: Local shape deformation generated by a grid pattern, *Journal of Vision*, 16, 15.

### (b) 国際会議発表 International Conference Presentations

- 1) Furukawa, K., Nakahara, K., and Mitsudo, H. (29 July 2016). Hemispheric asymmetry in visuospatial attention: Evidence from a functional visual field task, 31st International Congress of Psychology, Yokohama, Japan.
- 2) Harada, Y., and Mitsudo, H. (27 July 2016). The shrinkage of the functional field of view depends on both item type and context, 31st International Congress of Psychology, Yokohama, Japan.
- 3) Harada, Y. and Mitsudo, H. (26 July 2016). The effect of retention interval on recognition memory for central and peripheral details of an armed individual, 31st International Congress of Psychology, Yokohama, Japan.
- 4) Uchiyama, T., and Mitsudo, H. (27 July 2016). Eye-closure enhances recognition memory with visual tests but not with auditory tests, 31st International Congress of Psychology, Yokohama, Japan.

### (c) 国内学会発表, 研究会等 Domestic Conference Presentations

- 1) 張伊, 光藤宏行 (2016年8月18日). 画像の大きさが3次元形状知覚に与える影響, 日本視覚学会 2016年夏季大会.
- 2) Qirui Yao, 光藤宏行 (2016年8月17日). Peripheral visual distractors lead to no bias in supra-second temporal estimation, 日本視覚学会 2016年夏季大会.
- 3) 富田青斗, 光藤宏行 (2016年6月19日). 単語の反復呈示は図形の選好を高める, 日本認知心理学会第14回大会.
- 4) 成儒彬, 光藤宏行 (2016年6月18日). 英語表記ロゴタイプは日本産飲料商品の印象を向上させる, 日本認知心理学会第14回大会.

### (d) 学会大会・会議・シンポジウムなどにおける役割 Leading Role in a Conference

- 1) 日本心理学会公開シンポジウム 高校生のための心理学講座シリーズ (九州・沖縄I地区), 企画・司会 (2016年9月10日)

## 8. 山田 祐樹 研究室 Yuki YAMADA

### (a) 英語学術論文・出版物 English Publications

- 1) Gobara, A., Yamada, Y., & Miura, K. (2016). Crossmodal modulation of spatial localization by mimetic words, *i-Perception*, 7, 1–9.

- 2) Iwasa, K., Tanaka, T., & Yamada, Y. (2016). Factor structure, reliability, and validity of the Japanese version of the Disgust Propensity and Sensitivity Scale-Revised, *PLOS ONE*, 11(10): e0164630.
- 3) Ariga, A., Yamada, Y., & Yamani, Y. (2016). Early visual perception potentiated by object affordances: Evidence from a temporal order judgment task, *i-Perception*, 7, 1–7.
- 4) Chaya, K., Xue, Y., Uto, Y., Yao, Q., & Yamada, Y. (2016). Fear of eyes: Triadic relation among social anxiety, trypophobia, and discomfort for eye cluster, *PeerJ*, 4: e1942.
- 5) Kishimoto, R., Sasaki, K., Gobara, A., Ojira, Y., Nam, G., Miura, K., & Yamada, Y. (2016). When a silhouette appears male: Observer's own physical fitness governs social categorization of sexually ambiguous stimuli, *Letters on Evolutionary Behavioral Science*, 7, 17–20.
- 6) Yamani, Y., Ariga, A., & Yamada, Y. (2016). Object affordances potentiate responses but do not guide attentional prioritization in a visual search task, *Frontiers in Integrative Neuroscience*, 9: 74.

(b) 国際会議発表 International Conference Presentations

- 1) Fuyuno, M., Yamashita, Y., Yamada, Y., & Nakajima, Y. (24–29 July 2016). Developing effective instructions to decrease Japanese speaker's nervousness during English and Japanese public speeches: Evidence from psychological and physiological measurements. The 31st International Congress of Psychology, Yokohama, Japan.
- 2) Sasaki, K., & Yamada, Y. (24–29 July 2016). Sense of object ownership and sense of agency. The 31st International Congress of Psychology, Yokohama, Japan.
- 3) Xue, Y., Chaya, K., Uto, Y., Yao, Q., & Yamada, Y. (24–29 July 2016). Fear of eyes: The influence of social anxiety on trypophobic eyes. The 31st International Congress of Psychology, Yokohama, Japan.
- 4) Gobara, A., Yamada, Y., & Miura, K. (24–29 July 2016). Sound symbolism modulates perceptual judgment on dynamic events. The 31st International Congress of Psychology, Yokohama, Japan.
- 5) Shigyo, M., Tsuzuki, N., Hamakawa, M., Tamura, K., Yamada, Y., Ishikawa, H., Kimura, A., Morinaga, M., Matsumune, N., & Okamoto, T. (5–9 June 2016). The emotional and electrophysiological effects of odor masking. The 17th International Symposium on Olfaction and Taste (ISOT2016), Yokohama, Japan.

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