第 23 回日本バーチャルリアリティ学会大会論文集（2018 年 9 月）

# 世界を目指せ！ ― トップコンファレンス採択論文紹介

Head to the World Stage!　-- Introductions of Accepted Papers in Top International Conferences

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3 次元ユーザインタフェース研究会 （http://www.vrsj.org/sig3dui/）

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**Abstract:** Selected papers which are accepted from Japan by so-called top conferences are introduced by each of the authors. The aim of this session is to share precious hard-earned experiences behind the scenes with especially younger but motivated researchers in Japanese research community.
*Key Words: SIGGRAPH, CHI, UIST, IEEE VR 3DUI.*

## 1. はじめに

本学会 3 次元ユーザインタフェース研究委員会では，「トップコンファレンス採択論文紹介」と題したオーガナイズドセッションを 2010 年より企画してきました．この中では，SIGGRAPH，CHI，UIST，IEEE VR などのトップコンファレンスで日本から採択された著者の皆さんに招待講演を頂いてきました．そして，ご研究の内容を日本語で紹介して頂くとともに，採択までのご苦労や論文の書き方，研究の進め方やモチベーションなどについてもお話し頂いてきました．これらは，国際舞台での活躍を目指そうとする若手研究者の皆さんに，夢を現実にするための手がかりとして共有され，多くの皆さんに参考にして頂けてきたと思います．

今年も多くの方々の論文が，上記トップコンファレンスで採択されています．そこで今年は，3 次元ユーザインタフェースにも関連するトピックスで，IEEE VR や CHI で採択された方々にお話しいただくことにしました．

## 2. トップコンファレンス採択論文やそれに関わる研究活動について

### 2.1 研究テーマの筋～最近の採択論文を交えて
伊藤 勇太（東京工業大学 情報理工学院 助教）

本講演では，研究のテーマ選択から研究の進め方，論文執筆方法などに関して，僭越ながら私の国際会議論文採択体験を交えて語らせて頂きます．具体的には，最近の IEEE VR や CHI の採択論文を紹介し，その研究の過程で重要だったことや気を付けたことなどをお伝えします．特に今回

の話の中心として、「研究テーマの筋」に着目し、「筋の良い研究は始める時にもう終わっている」という心持を皆さんと共有できればよいなと思っています．

### 2.2 IEEE VR 2018 採択論文 Ascending and Descending in Virtual Reality: Simple and Safe System using Passive Haptics
長尾 涼平（東京大学大学院 情報理工学系研究科 修士課程 2 年）

3 次元バーチャル空間を階段や坂道のように歩行により上下移動する手法は少なく，その多くが高コストなデバイスにより物理的な段差を作り出すものであった．本研究では Passive Haptics (実際に物体に触れることで得られる触覚)を応用することで，段差を作り出すことなくユーザに階段昇降感覚を提示可能なシステムを構築した．このシステムでは階段と靴をバーチャル空間内で視覚提示し，この視覚情報に対応した段差に相当する触覚情報をユーザの足裏に提示することで，階段昇降感覚を提示する．触覚提示にはコストやタイムラグなどの観点から Passive Haptics の手法を採用し，ユーザは床に設置された小さな突起を踏むことで足裏に触覚フィードバックを得る．本研究ではこの小さな突起の形状及びバーチャル空間を歩行する際の視点操作方法を評価・考察しシステムを構築した．

## 3. トップコンファレンス採択論文一覧

3 次元ユーザインタフェースに関わりが深いコンファレ

ンスである ISMAR 2017, SIGGRAPH ASIA 2017, UIST 2017, IEEE VR 2018, CHI 2018, SIGGRAPH 2018 に採択された論文の中で,日本の著者が含まれているものを掲載いたしましたので,是非ご参照ください. 確認しながら抽出しましたが,漏れや間違いがある場合にはご容赦ください.

## ISMAR 2017 採択論文 —Papers （5 件）:

（採択率: TVCG Special section 14/113 = 12.4%, ISMAR conference paper 17 /99 = 17.2%）

- VisMerge: Light Adaptive Vision Augmentation via Spectral and Temporal Fusion of Non-visible Light
  Jason Orlosky, Peter Kim, Kiyoshi Kiyokawa, Tomohiro Mashita, Photchara Ratsamee, Yuki Uranishi, Haruo Takemura (*Osaka Univeristy*)

- Simultaneous Projection and Positioning of Laser Projector Pixels
  Yuki Kitajima, Daisuke Iwai, Kosuke Sato (*Osaka University*)

- Extended Dot Cluster Marker for High-speed 3D Tracking in Dynamic Projection Mapping
  Yoshihiro Watanabe, Toshiyuki Kato, Masatoshi Ishikawa (*University of Tokyo*)

- Occlusion Leak Compensation for Optical See-Through Displays using a Single-layer Transmissive Spatial Light Modulator
  Yuta Itoh, Takumi Hamasaki, Maki Sugimoto (*Keio University*)

- Synthesis of Environment Maps for Mixed Reality
  David R. Walton(*University College London*), Diego Thomas(*Kyusyu University*), Anthony Steed(*University College London*), Akihiro Sugimoto (*National Institute of Informatics*)

## UIST2017 採択論文 —Papers （9 件）

（全体の採択率は, 73/324 = 22.5%）

- Everyday Eye Contact Detection Using Unsupervised Gaze Target Discovery
  Xucong Zhang (*Max Planck Institute for Informatics*), Yusuke Sugano(*Osaka University*), Andreas Bulling (*Max Planck Institute for Informatics*)

- You as a Puppet: Evaluation of Telepresence User Interface for Puppetry
  Mose Sakashita, Tatsuya Minagawa, Amy Koike, Ippei Suzuki, Keisuke Kawahara, Yoichi Ochiai (*University of Tsukuba*)

- FoamSense: Design of three dimensional soft sensors with porous materials
  Satoshi Nakamaru, Ryosuke Nakayama (*Keio University*), Ryuma Niiyama (*The University of Tokyo*), Yasuaki Kakehi (*Keio University*)

- BlowFab: Rapid Prototyping for Rigid and Reusable Objects using Inflation of Laser-cut Surfaces
  Junichi Yamaoka (*Keio University*), Ryuma Niiyama (*The University of Tokyo*), Yasuaki Kakehi (*Keio University*)

- SoundCraft: Enabling Spatial Interactions on Smartwatches using Hand Generated Acoustics
  Teng Han, Khalad Hasan (*University of Manitoba*), Keisuke Nakamura, Randy Gomez (*Honda Research Institute Japan*), Pourang Irani (*University of Manitoba*)

- Qoom: An Interactive Omnidirectional Ball Display
  Shio Miyafuji, Zhengqing Li, Toshiki Sato, Hideki Koike (*Tokyo Institute of Technology*)

- iSphere: Self-Luminous Spherical Drone Display
  Wataru Yamada, Kazuhiro Yamada, Hiroyuki Manabe, Daizo Ikeda (*NTT DOCOMO*)

- A Capacitive Touch Sensing Technique with Series-connected Sensing Electrodes
  Hiroyuki Manabe, Wataru Yamada (*NTT DOCOMO*)

- CanalSense: Face-Related Movement Recognition System based on Sensing Air Pressure in Ear Canals
  Toshiyuki Ando, Yuki Kubo, Buntarou Shizuki, Shin Takahashi (*University of Tsukuba*)

## SIGGRAPH ASIA 2017 採択論文 —Papers （4 件）

（全体の採択率は, 75/312 =24%）

- Deep Reverse Tone Mapping
  Yuki Endo, Yoshihiro Kanamori, Jun Mitani (*University of Tsukuba*)

- Avatar Digitization From a Single Image for Real-time Rendering
  Liwen Hu, Shunsuke Saito, Lingyu Wei (*Pinscreen, University of Southern California*), Koki Nagano, Jaewoo Seo, Jens Fursund, Iman Sadeghi, Carrie Sun, Yen-Chun Chen (*Pinscreen*), Hao Li (*Pinscreen, University of Southern California, USC Institute for Creative Technologies*)

- A Hyperbolic Geometric Flow for Evolving Films and Foams
  Sadashige Ishida (*Nikon Corporation, The University of Tokyo*), Masafumi Yamamoto (*The University of Tokyo*), Ryoichi Ando (*National Institute of Informatics*), Toshiya Hachisuka (*The University of Tokyo*)

- Fully Perceptual-Based 3D Spatial Sound Individualization with an Adaptive Variational AutoEncoder
  Kazuhiko Yamamoto, Takeo Igarashi (*The University of Tokyo*)

## IEEE VR 2018 採択論文 —Papers （9 件）:
（採択率: TVCG Journal paper 29/178 = 16.3%, IEEE VR Conference paper 65/316 = 20.5%）

- Force Rendering and Its Evaluation of a Friction-based Walking Sensation Display for a Seated User
  Ginga Kato, Yoshihiro Kuroda, Kiyoshi Kiyokawa, Haruo Takemura (*Osaka University*)

- Effect of Electrical Stimulation Haptic Feedback on Perceptions of Softness-Hardness and Stickiness while Touching a Virtual Object
  Vibol Yem (*The University of Electro-Communications*),

Kevin Vu (*Polytech Paris UPMC*), Yuki Kon, Hiroyuki Kajimoto (*The University of Electro-Communications*)

- HySAR: Hybrid Material Rendering by an Optical See-Through Head-Mounted Display with Spatial Augmented Reality Projection
Takumi Hamasaki, Yuta Itoh, Yuichi Hiroi (*Keio University*), Daisuke Iwai (*Osaka Univeristy*), Maki Sugimoto (*Keio University*)

- BrightView: Increasing Perceived Brightness of Optical See-Through Head-Mounted Displays Through Unnoticeable Incident Light Reduction
Shohei Mori (*Keio University*), Sei Ikeda (*Ritsumeikan University*), Alexander Plopski, Christian Sandor (*Nara Institute of Science and Technology*)

- Midair Ultrasound Fragrance Rendering
Keisuke Hasegawa (*University of Tokyo*), Liwei Qiu (*Riken*), Hiroyuki Shinoda (*The University of Tokyo*)

- Ascending and Descending in Virtual Reality: Simple and Safe System using Passive Haptics
Ryohei Nagao, Keigo Matsumoto, Takuji Narumi, Tomohiro Tanikawa, Michitaka Hirose (*University of Tokyo*)

- Transferability of Spatial Maps: Augmented Versus Virtual Reality Training
Nicko R. Caluya, Christian Sandor, Alexander Plopski, Takafumi Taketomi, Jayzon F. Ty, Hirokazu Kato (*Nara Institute of Science and Technology*)

- User Preference for Sharp View-Enhanced Virtual Text during Non-Fixated Viewing
Trey Cook (*Green Mountain Technology*), Nate Phillips, Kristen Massey (*Mississippi State University*), Alexander Plopski, Christian Sandor (*Nara Institute of Science and Technology*), J. Edward Swan (*Mississippi State University*)

- Fabricating Diminishable Visual Markers for Geometric Registration in Projection Mapping
Hirotaka Asayama, Daisuke Iwai, Kosuke Sato (*Osaka University*)

## CHI 2018 採択論文 —Papers and Notes （19 件）:
（全体の採択率は，666/2590 = 25.7％）

- HCI Interventions for Science Communication
Vicki Moulder (*The University of Tokyo*), Lorna R Boschman (*Digital Stories.ca*), Ron Wakkary, Carman Neustaedter (*Simon Fraser University*), Hiroki Hill Kobayashi (*The University of Tokyo*)

- PEP (3D Printed Electronic Papercrafts): An Integrated Approach for 3D Sculpting Paper-Based Electronic Devices
Hyunjoo Oh (*University of Colorado Boulder*), Tung D. Ta (*The University of Tokyo*), Ryo Suzuki, Mark D. Gross (*University of Colorado*), Yoshihiro Kawahara (*The University of Tokyo*), Lining Yao (*Carnegie Mellon University*)

- ExtVision: Augmentation of Visual Experiences with Generation of Context Images for a Peripheral Vision Using DNN

Naoki Kimura (*The University of Tokyo*), Jun Rekimoto (*The University of Tokyo / Sony CSL*)

- How Information Sharing about Care Recipients by Family Caregivers Impacts Family Communication
Naomi Yamashita (*NTT Communication Science Labs*), Hideaki Kuzuoka (*University of Tsukuba*), Takashi Kudo (*Osaka University*), Keiji Hirata (*Future University Hakodate*), Eiji Aramaki (*Nara Institute of Science and Technology*), Kazuki Hattori (*University of Tsukuba*)

- Effects of Viewing Multiple Viewpoint Videos on Metacognition of Collaborative Experiences
Yasuyuki Sumi (*Future University Hakodate*), Masaki Suwa (*Keio University*), Koichi Hanaue (*Integrated Environment Support Inc.*)

- Steering through Successive Objects
Shota Yamanaka (*Yahoo Japan Corporation*), Wolfgang Stuerzlinger (*Simon Fraser University*), Homei Miyashita (*Meiji University*)

- Vibrational Artificial Subtle Expressions: Conveying System's Confidence Level to Users by Means of Smartphone Vibration
Takanori Komatsu (*Meiji University*), Kazuki Kobayashi (*Shinshu University*), Seiji Yamada (*National Institute of Informatics / SOKENDAI*), Kotaro Funakoshi, Mikio Nakano (*Honda Research Institute Japan Co., Ltd.*)

- Double-sided Printed Tactile Display with Electro Stimuli and Electrostatic Forces and its Assessment
Kunihiro Kato (*Meiji University*), Hiroki Ishizuka (*Kagawa University*), Hiroyuki Kajimoto (*The University of Electro-Communications*), Homei Miyashita (*Meiji University*)

- Designing Consistent Gestures Across Device Types: Eliciting RSVP Controls for Phone, Watch, and Glasses
Tilman Dingler (*Osaka Prefecture University*), Rufat Rzayev, Alireza Sahami Shirazi, Niels Henze (*University of Stuttgart*)

- Reading on Smart Glasses: The Effect of Text Position, Presentation Type and Walking
Rufat Rzayev, Paweł W Woźniak (*University of Stuttgart*), Tilman Dingler (*Osaka Prefecture University*), Niels Henze (*University of Stuttgart*)

- Training Person-Specific Gaze Estimators from User Interactions with Multiple Devices
Xucong Zhang, Michael Xuelin Huang (*Max Planck Institute for Informatics*), Yusuke Sugano (*Osaka University*), Andreas Bulling (*Max Planck Institute for Informatics*)

- OptiMo: Optimization-Guided Motion Editing for Keyframe Character Animation
Yuki Koyama, Masataka Goto (*National Institute of Advanced Industrial Science and Technology*)

- Effects of Enhanced Gaze Presentation on Gaze Leading in Remote Collaborative Physical Tasks
Mai Otsuki (*University of Tsukuba*), Keita Maruyama (*Intelligent Interaction Technologies Department*), Hideaki Kuzuoka (*University of Tsukuba*), Yusuke Suzuki (*Oki Electric Industry Co., Ltd.*)

- Ohmic-Touch: Extending Touch Interaction by Indirect Touch through Resistive Objects
Kaori Ikematsu, Itiro Siio (*Ochanomizu University*)

- AssociPass: A User Authentication System with Word-Pairs for Security against Guess Attack
Rei Yamagishi, Tetsuji Takada (*The University of Electro-Communications*)

- Crowdsourcing Treatments for Low Back Pain
Simo Johannes Hosio (*University of Oulu*), Jaro Karppinen, Esa-Pekka Takala (*Finnish Institute of Occupational Health*), Jani Takatalo (*Oulu University Hospital*), Jorge Goncalves, Niels van Berkel (*The University of Melbourne*), Shin'ichi Konomi (*Kyushu University*), Vassilis Kostakos (*The University of Melbourne*)

- Dynamic Object Scanning: Object-Based Elastic Timeline for Quickly Browsing First-Person Videos
Seita Kayukawa (*Waseda University*), Keita Higuchi, Ryo Yonetani (*The University of Tokyo*), Masanori Nakamura (*Waseda University*), Yoichi Sato (*The University of Tokyo*), Shigeo Morishima (*Waseda Research Institute for Science and Engineering*)

- Controlling Maximal Voluntary Contraction of the Upper Limb Muscles by Facial Electrical Stimulation
Arinobu Niijima, Takashi Isezaki, Ryosuke Aoki, Tomoki Watanabe, Tomohiro Yamada (*NTT Corporation*)

- Reactile: Programming Swarm User Interfaces through Direct Physical Manipulation
Ryo Suzuki (*University of Colorado Boulder*), Jun Kato (*National Institute of Advanced Industrial Science and Technology*), Mark D. Gross, Tom Yeh (*University of Colorado*)

SIGGRAPH 2018 採択論文 —Papers （8 件）:
（本稿執筆時点で，採択率は未発表）

- Mastering Sketching: Adversarial Augmentation for Structured Prediction
Edgar Simo-Serra, Satoshi Iizuka, Hiroshi Ishikawa (*Waseda University*)

- Real-Time Data-Driven Interactive Rough Sketch Inking
Edgar Simo-Serra, Satoshi Iizuka, Hiroshi Ishikawa (*Waseda University*)

- Gradient-Domain Volumetric Photon Density Estimation
Adrien Gruson (*The University of Tokyo*), Binh-Son Hua (*Singapore University of Technology and Design*), Nicolas Vibert (*McGill University*), Derek Nowrouzezahrai (*McGill University*), Toshiya Hachisuka (*The University of Tokyo*)

- Fabricating Reflectors for Displaying Multiple Images
Kaisei Sakurai (*DWANGO Co., Ltd., Dwango CG Research*), Yoshinori Dobashi (*Hokkaido University, Dwango CG Research*), Kei Iwasaki (*Wakayama University, Dwango CG Research*), Tomoyuki Nishita (*Hiroshima Shudo University, Dwango CG Research*)

- Example-based Turbulence Style Transfer
Syuhei Sato (*DWANGO Co., Ltd., Dwango CG Research*), Yoshinori Dobashi (*Hokkaido University, Dwango CG Research*), Theodore Kim (*Pixar Animation Studios*), Tomoyuki Nishita (*Hiroshima Shudo University, Dwango CG Research*)

- High-Fidelity Facial Reflectance and Geometry Inference from an Unconstrained Image
Shugo Yamaguchi (*Waseda University, USC ICT*), Shunsuke Saito (*University of Southern California, Pinscreen*), Koki Nagano (*Pinscreen*), Yajie Zhao (*USC ICT*), Weikai Chen (*USC ICT*), Kyle Olszewski (*University of Southern California, Pinscreen*), Shigeo Morishima (*Waseda University*), Hao Li (*University of Southern California, Pinscreen*)

- CoreCavity: Interactive Shell Decomposition for Fabrication with Two-Piece Rigid Molds
Kazutaka Nakashima (*The University of Tokyo*), Thomas Auzinger (*IST Austria*), Emmanuel Iarussi (*CONICETIST Austria*), Ran Zhang (*IST Austria*), Takeo Igarashi (*The University of Tokyo*), Bernd Bickel (*IST Austria*)

- Precomputed Panel Solver for Aerodynamics Simulation
Haoran Xie (*The University of Tokyo, Japan Advanced Institute of Science and Technology*), Takeo Igarashi (*The University of Tokyo*), Kazunori Miyata (*Japan Advanced Institute of Science and Technology*)