

Thu. Nov 28, 2019

Room 107

Short Presentation

[EPp1-sp] Electronic Paper

Chair: Norihisa Kobayashi (Chiba Univ.)

Co-Chair: Haruhiko Okumura (Toshiba)

10:36 AM - 10:39 AM Room 107 (1F)

[EPp1-sp-1L] Conducting Polypyrrole-Silica

Nanocomposite Particles for  
Electrophoretic Display

\*Naohiro Takahashi<sup>1</sup>, Shuichi Maeda<sup>1</sup> (1. Tokai  
University (Japan))

10:36 AM - 10:39 AM

Room 108

Short Presentation

[PRJp1-sp] Projection Technologies

Chair: Muneharu Kuwata (Mitsubishi Elec.)

Co-Chair: Takakazu Hayashi (Okamoto Glass)

10:20 AM - 10:38 AM Room 108 (1F)

[PRJp1-sp-1] Developing an Augmented Reality System of  
Nail Make-up

\*Yen-Ju Chou<sup>1</sup>, Tzung-Han Lin<sup>1</sup> (1. National  
Taiwan University of Science and Technology  
(Taiwan))

10:20 AM - 10:23 AM

[PRJp1-sp-2] Forming Two-View Aerial Signage Over an  
LED panel by Use of a Retro-Reflective  
Slit-Array

\*Daiki Nishimura<sup>1</sup>, Hirotsugu Yamamoto<sup>1,2</sup> (1.  
Utsunomiya university (Japan), 2. JST, ACCEL  
(Japan))

10:23 AM - 10:26 AM

[PRJp1-sp-3] Image Analysis by Drone System for  
Environmental Inspection

Chung-Jen Ou<sup>2</sup>, \*Ming-Jun Liu<sup>1</sup>, Der-Chin Chen<sup>1</sup>  
(1. Feng-Chia University (Taiwan), 2.

Hsiuping University of Science and Technology  
(Taiwan))

10:26 AM - 10:29 AM

[PRJp1-sp-4] Color-changeable and touchable volumetric  
display by projection of aerial plasma  
emission

\*Shun Miura<sup>1</sup>, Kota Kumagai<sup>1</sup>, Yoshio Hayasaki<sup>1</sup>  
(1. Utsunomiya University (Japan))

10:29 AM - 10:32 AM

[PRJp1-sp-5L] Exploring the combination of optical  
components suitable for the large device  
to form aerial image by AIRR

\*Masaki Yasugi<sup>1,2</sup>, Hirotsugu Yamamoto<sup>1,2</sup> (1.  
Utsunomiya University (Japan), 2. JST, ACCEL  
(Japan))

10:32 AM - 10:35 AM

[PRJp1-sp-6L] Laser Converter Lighting System using  
Compound Recycling Reflectors

\*Kenneth Li<sup>1</sup> (1. Optonomous Technologies  
Inc. (United States of America))

10:35 AM - 10:38 AM

Short Presentation

## [EPp1-sp] Electronic Paper

Chair: Norihisa Kobayashi (Chiba Univ.)

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Thu. Nov 28, 2019 10:36 AM - 10:39 AM Room 107 (1F)

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## [EPp1-sp-1L] Conducting Polypyrrole-Silica Nanocomposite Particles for Electrophoretic Display

\*Naohiro Takahashi<sup>1</sup>, Shuichi Maeda<sup>1</sup> (1. Tokai University (Japan))

10:36 AM - 10:39 AM

10:36 AM - 10:39 AM (Thu. Nov 28, 2019 10:36 AM - 10:39 AM Room 107)

## [EPp1-sp-1L] Conducting Polypyrrole-Silica Nanocomposite Particles for Electrophoretic Display

\*Naohiro Takahashi<sup>1</sup>, Shuichi Maeda<sup>1</sup> (1. Tokai University (Japan))

Keywords: Polypyrrole, Silica, Electrophoretic Display

We have prepared organic conducting nanocomposite particles that utilize polypyrrole as conducting parts and small silica particles as dispersants. We found that the polypyrrole-silica nanocomposite particles can be utilized as display elements for electrophoretic display and black inks for printed electronics due to their high colloid stability.

## Short Presentation

**[PRJp1-sp] Projection Technologies**

Chair: Muneharu Kuwata (Mitsubishi Elec.)

Co-Chair: Takakazu Hayashi (Okamoto Glass)

Thu. Nov 28, 2019 10:20 AM - 10:38 AM Room 108 (1F)

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- [PRJp1-sp-1] **Developing an Augmented Reality System of Nail Make-up**  
 \*Yen-Ju Chou<sup>1</sup>, Tzung-Han Lin<sup>1</sup> (1. National Taiwan University of Science and Technology (Taiwan))  
 10:20 AM - 10:23 AM
- [PRJp1-sp-2] **Forming Two-View Aerial Signage Over an LED panel by Use of a Retro-Reflective Slit-Array**  
 \*Daiki Nishimura<sup>1</sup>, Hirotsugu Yamamoto<sup>1,2</sup> (1. Utsunomiya university (Japan), 2. JST, ACCEL (Japan))  
 10:23 AM - 10:26 AM
- [PRJp1-sp-3] **Image Analysis by Drone System for Environmental Inspection**  
 Chung-Jen Ou<sup>2</sup>, \*Ming-Jun Liu<sup>1</sup>, Der-Chin Chen<sup>1</sup> (1. Feng-Chia University (Taiwan), 2. Hsiuping University of Science and Technology (Taiwan))  
 10:26 AM - 10:29 AM
- [PRJp1-sp-4] **Color-changeable and touchable volumetric display by projection of aerial plasma emission**  
 \*Shun Miura<sup>1</sup>, Kota Kumagai<sup>1</sup>, Yoshio Hayasaki<sup>1</sup> (1. Utsunomiya University (Japan))  
 10:29 AM - 10:32 AM
- [PRJp1-sp-5L] **Exploring the combination of optical components suitable for the large device to form aerial image by AIRR**  
 \*Masaki Yasugi<sup>1,2</sup>, Hirotsugu Yamamoto<sup>1,2</sup> (1. Utsunomiya University (Japan), 2. JST, ACCEL (Japan))  
 10:32 AM - 10:35 AM
- [PRJp1-sp-6L] **Laser Converter Lighting System using Compound Recycling Reflectors**  
 \*Kenneth Li<sup>1</sup> (1. Optonomous Technologies Inc. (United States of America))  
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10:20 AM - 10:23 AM (Thu. Nov 28, 2019 10:20 AM - 10:38 AM Room 108)

## [PRJp1-sp-1] Developing an Augmented Reality System of Nail Make-up

\*Yen-Ju Chou<sup>1</sup>, Tzung-Han Lin<sup>1</sup> (1. National Taiwan University of Science and Technology (Taiwan))

Keywords: Augmented Reality, Nail Make-up, AR Projection

*We developed system for AR application. In practice, we utilized color to extract nail area. Additional color projector, which is well calibrated, will cast desired patterns on nails. As a result, augmented and vivid patterns on nail are carried out by our formulated algorithm. It's useful for customers and nail-salon.*

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10:23 AM - 10:26 AM (Thu. Nov 28, 2019 10:20 AM - 10:38 AM Room 108)

## [PRJp1-sp-2] Forming Two-View Aerial Signage Over an LED panel by Use of a Retro-Reflective Slit-Array

\*Daiki Nishimura<sup>1</sup>, Hirotsugu Yamamoto<sup>1,2</sup> (1. Utsunomiya university (Japan), 2. JST, ACCEL (Japan))

Keywords: aerial signage, retro-reflector, parallax barrier, multi-view

We propose an optical system for two-view aerial signage over an LED panel. A retro-reflective slit array and a beam splitter are placed in front of the LED panel and form the aerial image over the LED panel. The aerial signage shows different apparent images depending on the viewing directions.

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10:26 AM - 10:29 AM (Thu. Nov 28, 2019 10:20 AM - 10:38 AM Room 108)

## [PRJp1-sp-3] Image Analysis by Drone System for Environmental Inspection

Chung-Jen Ou<sup>2</sup>, \*Ming-Jun Liu<sup>1</sup>, Der-Chin Chen<sup>1</sup> (1. Feng-Chia University (Taiwan), 2. Hsiuping University of Science and Technology (Taiwan))

Keywords: Drone System, PM2.5

This report explores the application of the aerial image system that integrated with the micro-recorder or micro-projector for environmental inspection. Corresponding display technology, combined with drones and artificial intelligence judgment criteria, can improve the application and complete the contribution of image display technology for cross-discipline application.

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10:29 AM - 10:32 AM (Thu. Nov 28, 2019 10:20 AM - 10:38 AM Room 108)

## [PRJp1-sp-4] Color-changeable and touchable volumetric display by projection of aerial plasma emission

\*Shun Miura<sup>1</sup>, Kota Kumagai<sup>1</sup>, Yoshio Hayasaki<sup>1</sup> (1. Utsunomiya University (Japan))

Keywords: Volumetric display, Projection, Plasma

Projection of volumetric images with aerial plasma voxels formed by femtosecond laser pulses was performed with two parabolic mirrors with a variable color filter. The projection enables us to change the color of voxels and touch the voxels safely.

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10:32 AM - 10:35 AM (Thu. Nov 28, 2019 10:20 AM - 10:38 AM Room 108)

## [PRJp1-sp-5L] Exploring the combination of optical components suitable for the large device to form aerial image by AIRR

\*Masaki Yasugi<sup>1,2</sup>, Hirotsugu Yamamoto<sup>1,2</sup> (1. Utsunomiya University (Japan), 2. JST, ACCEL (Japan))

Keywords: aerial image, retro-reflection, AIRR, luminance

This paper reports comparative study of optical components to form life-scale aerial image formed with AIRR (aerial imaging by retro-reflection). We assembled four life-size aerial devices that surrounds a user. We found that locating prism-type retro-reflector above the light source and the beam splitter gives brightness and high contrast.

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10:35 AM - 10:38 AM (Thu. Nov 28, 2019 10:20 AM - 10:38 AM Room 108)

## [PRJp1-sp-6L] Laser Converter Lighting System using Compound Recycling Reflectors

\*Kenneth Li<sup>1</sup> (1. Optonomous Technologies Inc. (United States of America))

Keywords: recycling, laser, lighting, diffuser, phosphor

Compact laser converter lighting system using diffuser and phosphor plates have been designed and being developed. With the addition of light recycling using a compound parabolic reflector, the brightness will be increased with a small output angle for ease in coupling.