

# FSE 若手 2nd event (June 15<sup>th</sup> & 16<sup>th</sup> 2021)

## General rules

1. Please keep the confidentiality. You are not allowed to record video or photo of our event. 守秘義務履行をお願いします。本イベントの動画や写真での保存は一切認めません。
2. Please turn on your video to see each others' face even if you are not the presenter. Let's make friends. 本イベントの目的の一つは交流なので、カメラはオンにしておいてください。

## Timeline

### **Day 1 (June 15th (Tuesday) 2021)**

9:00-9:15 Opening (ZOOM)

9:20-10:10 Tutorial session 1 Chair: Prof. Hiroyuki Matsui (Yamagata Univ.)

(ZOOM, 40 min: presentation, 10 min: Q and A)

**Prof. Teppei Araki (Osaka University)**

**生体電位計測の基礎知識とフレキシブルセンサ応用**

**Basics of In vivo biosensing by flexible devices**

“本チュートリアルでは、インプラントやウェアラブルセンサを用いた生体電位計測に関する基礎知識を説明し、その理解を深めることを目的としている。さらには最新のフレキシブルデバイス研究動向にも触れ、研究課題の探索にも役立つ講演となることを期待している。今回、フレキシブル・ストレッチャブル・エレクトロニクス研究会に関わる学生を主に対象としている。”

10:15-11:05 Tutorial session 2 Chair: Prof. Hiroyuki Matsui (Yamagata Univ.)

(ZOOM, 40 min: presentation, 10 min: Q and A)

**Prof. Yi-Fei Wang (Yamagata University)**

**Printing Technologies for Flexible and Stretchable Electronics**

“This presentation will introduce the printing technologies for flexible and stretchable electronics (FSE). It is mainly targeted at students who are interested in printed electronics. Fundamental knowledge of inkjet printing, screen-printing, direct-ink-writing, reverse-offset printing will be introduced, including their equipment composition, working principle, operation, and applied situations. Recent progress in printed devices will be briefly reported, and examples of device fabrication, including OTFT, pressure/strain sensors, will also be introduced.”

11:10-12:40 Poster session 1 (Spatial chat)

12:40-13:40 Lunch (Spatial chat)

13:40-14:10 Student mixer 1 (Spatial chat)

14:15-15:05 Keynote talk 1 Chair: Prof. Sunghoon Lee (Univ. of Tokyo)

(ZOOM, 40 min: presentation, 10 min: Q and A)

**Prof. Takafumi Uemura (Osaka University)**

**フレキシブル有機薄膜トランジスタの基礎と生体計測応用：トランジスタノイズから信号処理回路応用まで**

**Basics of flexible organic thin-film transistors and their applications in biomedical measurements: From transistor noise to signal processing circuit applications.**

“本講演では、フレキシブル有機薄膜トランジスタのデバイス基礎と、生体計測応用について概説する。多点センサ向けのスイッチング回路、生体信号検出のための電圧増幅回路、発電デバイスにおける整流回路など、具体的な事例と共に紹介する。”

15:10-17:00 Oral presentation Session 1 Chair: Prof. Sunghoon Lee (Univ. of Tokyo)

(ZOOM, 25 min x2, 10min break, 25 min x2)

### **Day 2 (June 16th (Wednesday) 2021)**

9:00-9:15 Opening (ZOOM)

9:20-10:10 Oral presentation Session 2 Chair: Prof. Hiroki Ota (YNU) (ZOOM, 25 min x2)

10:15-11:05 Tutorial session 3 Chair: Prof. Hiroki Ota (YNU)

(ZOOM, 40 min: presentation, 10 min: Q and A)

**Dr. Kenjiro Fukuda (RIKEN)**

**プレゼンスライドの作り方**

**How to prepare presentation slides**

“本講演では若手研究者のプレゼンテーション力向上を目的とする。研究者プレゼンテーションの作り方や発表の仕方等について、講演者がこれまでに得てきた知識・経験をベースに基礎的な部分の情報提供を行う。また、聴講者との議論を通じて、プレゼンテーションの質向上に対する意識を高める場としたい。本チュートリアルが会員自身のプレゼン力向上のみならず、新入生指導の一助となれば幸いである。”

11:10-12:40 Poster session 2 (Spatial chat)

12:40-13:40 Lunch (Spatial chat)

13:40-14:10 Student mixer 2 (Spatial chat)

14:15-16:05 Oral presentation Session 3 Chair: Prof. Tomohito Sekine (Yamagata Univ.)  
(ZOOM, 25 min x2, 10min break, 25 min x2)

16:10-17:00 Keynote talk 2 Chair: Prof. Tomohito Sekine (Yamagata Univ.)  
(ZOOM, 40 min: presentation, 10 min: Q and A)

**Prof. Toshinori Fujie (Tokyo Institute of Technology)**

**バイオマテリアルサイエンスを規範にした FSE 研究**

**FSE research guided by the biomaterials science**

“本講演では、フレキシブル・ストレッチャブルエレクトロニクス(FSE)の医療・ヘルスケア分野への応用を目指す若手研究者に向けて、医療機器開発の基礎にあたるバイオマテリアルサイエンスを概説する。また、バイオマテリアルを生業とする演者の研究経歴と内容を紹介し、斬新な医療機器開発に向けた FSE 研究の可能性や課題の共有を目指したい。”

17:10-17:30 Award & Closing (ZOOM)

17:40-20:00 Online party (Spatial chat, Free discussion about Carrier plan after PhD)

Keynote talks and Tutorial sessions are supported by KGRI (Keio Global Research Institute).

[Link](#)

基調講演とチュートリアル講演は KGRI (Keio Global Research Institute)よりご支援いただきました。

FSE Best presentation awards were given to the following presenters. Congratulations!

FSE Best presentation award は以下の発表者に与えられました。おめでとうございます！

#### Poster

**Seiji Wakabayashi** (Osaka Prefecture Univ.)

*“Laser-induced graphene-based flexible tactile pressure sensor array”*

**Wenqing Wang** (The Univ. of Tokyo)

*“Highly sensitive nanomesh-based humidity sensor for skin moisture detection”*

#### Oral presentation

**Masahiro Sugiyama** (Osaka Univ.)

*“An ultraflexible organic amplifier for processing electrocardiogram”*

**Kento Yamagishi** (SUTD)

*“Ultra-deformable and tissue-adhesive liquid metal antennas”*

**Poster session** (Presenters' name is in **bold**.)

**Session 1 11:10-12:40 June 15<sup>th</sup>**

Poster 1-1 (Poster: English, Language: English)

“-Title confidential-”

**Haoyang Wang (D)**, Yusaku Tagawa, Sunghoon Lee, Tomoyuki Yokota, Takao Someya  
Department of Electrical Engineering and Information System, The University of Tokyo

Poster 1-2 (Poster: English, Language: English)

“-Title confidential-”

**Jiachen Wang (D)**<sup>1,2</sup>, Sixing Xiong<sup>2</sup>, Kenjiro Fukuda<sup>2</sup>, Takao Someya<sup>1,2</sup>

1. Electrical Engineering and Information System, The University of Tokyo, 2. Thin-Film Device Laboratory, Riken

Poster 1-3 (Poster: English, Language: English)

“Heterogeneous chemical patterns of polymer gate dielectrics in ultraflexible organic transistors”

**Koki Taguchi (D)**<sup>1,2,3</sup>, Takafumi Uemura<sup>1,3</sup>, Naoko Namba<sup>1,3</sup>, Andreas Petritz<sup>4</sup>, Teppei Araki<sup>1,2,3</sup>, Masahiro Sugiyama<sup>1,2,3</sup>, Tsuyoshi Sekitani<sup>1,2,3</sup>

1. SANKEN, Osaka University, 2. Graduate School of Engineering, Osaka University, 3. PhotoBio-OIL, AIST, 4. Joanneum Research

Poster 1-4 (Poster: English, Language: English)

“Indoor organic photovoltaics with enhanced performance by doping-induced interface”

**Shipei Zhang (M)**<sup>1,2</sup>, Sixing Xiong<sup>2</sup>, Kenjiro Fukuda<sup>2,3</sup>, Shinjiro Umezu<sup>1</sup>, Takao Someya<sup>2,3,4</sup>

1. Modern Mechanical Engineering, Waseda University 2. Center for Emergent Matter Science, RIKEN 3. Thin-film Device Laboratory, RIKEN 4. Electrical Engineering and Information Systems, The University of Tokyo

Poster 1-5 (Poster: English, Language: Japanese)

“Flexible thin film induction heater for local thermotherapy”

**Masato Saito (M)**<sup>1</sup>, Eiichi Kanai<sup>2</sup>, **Hajime Fujita (M)**<sup>1</sup>, Tatsuya Aso<sup>3</sup>, Noriyuki Matsutani<sup>3</sup>, and Toshinori Fujie<sup>1</sup>

1. School of Life Science and Technology, Tokyo Institute of Technology, 2. School of Veterinary Medicine, Azabu University, 3. Teikyo University Hospital, Mizonokuchi

Poster 1-6 (Poster: English, Language: Japanese)

“Development of silver nanoparticle ink for reverse offset printing and fabrication of high-resolution printed electrodes”

**Taichi Kikkawa (M)**<sup>1</sup>, Tomohito Sekine<sup>1</sup>, Yasunori Takeda<sup>1</sup>, Daisuke Kumaki<sup>1</sup>, Shizuo Tokito<sup>1</sup>

1. Graduate School of Organic Materials Science, Yamagata University

Poster 1-7 (Poster: Japanese, Language: Japanese)

“Laser-induced graphene-based flexible tactile pressure sensor array”

**Seiji Wakabayashi (M)**<sup>1</sup>, Takayuki Arie<sup>1</sup>, Seiji Akita<sup>1</sup>, Kuniharu Takei<sup>1</sup>

1. Osaka Prefecture University

Poster 1-8 (Poster: Japanese, Language: Japanese)

“PEDOT:PSS 有機電気化学トランジスタの電子スピン共鳴測定”

**Kensuke Imamiya (M)**<sup>1</sup>, Mayu Uematsu<sup>1</sup>, Hiroyuki Matsui<sup>1</sup>

1. ROEL, Yamagata Univ.

## **Session 2 11:10-12:40 June 16<sup>th</sup>**

### Poster 2-1 (Poster: English, Language: English)

“Polymer nanosheet for low-adhesive sEMG measurement”

**Marimo Ito (M)**, Tatsuhiro Horii, Toshinori Fujie

Life Science and Technology, Tokyo Institute of Technology

### Poster 2-2 (Poster: English, Language: English)

“Improving mechanical property of nanomesh electrode by heat pressing process”

**Yutaro Kato (M)**<sup>1</sup>, Chihiro Okutani<sup>1</sup>, Jaejoon Kim<sup>1</sup>, Sung hoon Lee<sup>1</sup>, Tomoyuki Yokota<sup>1</sup>, Takao Someya<sup>1</sup>

<sup>1</sup>. Department of Electrical Engineering and Information Systems, School of Engineering, The University of Tokyo

### Poster 2-3 (Poster: English, Language: English)

“Highly sensitive nanomesh-based humidity sensor for skin moisture detection”

**Wenqing Wang (M)**<sup>1</sup>, Md Osman Goni Nayeem<sup>1</sup>, Haoyang Wang<sup>1</sup>, Binghao Wang<sup>1</sup>, Sunghoon Lee<sup>1</sup>, Tomoyuki Yokota<sup>1</sup>, Takao Someya<sup>1</sup>

<sup>1</sup>Department of Electrical Engineering and Information Systems, School of Engineering, The University of Tokyo

### Poster 2-4 (Poster: English, Language: Japanese)

“Polymer Thin Film Substrate for Integration with Engineered Cardiac Tissue”

**Yohei Kawamura (M)**<sup>1</sup>, Takashi Ohya<sup>2</sup>, Tetsutaro Kikuchi<sup>3</sup>, Daisuke Sasaki<sup>3</sup>, Katsuhisa Matsuura<sup>3</sup>, Tatsuya Shimizu<sup>3</sup>, Kenjiro Fukuda<sup>4</sup>, Takao Someya<sup>4</sup>, Shinjiro Umezu<sup>5</sup>

<sup>1</sup>. Department of Integrative Bioscience and Biomedical Engineering (ASE Graduate School), Waseda University, <sup>2</sup>. Department of Modern Mechanical Engineering (CSE Graduate School), Waseda University, <sup>3</sup>. Institute of Advanced Biomedical Engineering and Science, Tokyo Women's Medical University <sup>4</sup>. RIKEN, <sup>5</sup>. Department of Modern Mechanical Engineering, Waseda University

### Poster 2-5 (Poster: English, Language: Japanese)

“Impact of intramolecular non-covalent interactions induced by ester side chains on photovoltaic properties of non-fullerene cells in thiazolothiazole-based  $\pi$ -conjugated polymers”

**Kodai Yamanaka (M)**<sup>1</sup>, Tsubasa Mikie<sup>1</sup>, Masahiko Saito<sup>1</sup>, Itaru Osaka<sup>1</sup>

<sup>1</sup>. Graduate School of Advanced Science and Engineering, Hiroshima University

### Poster 2-6 (Poster: English, Language: Japanese)

“Highly conductive and stretchable polymers for high-resolution capacitive sensor matrices”

**Tokihiko Shimura (B4)**<sup>1</sup>, **Shun Sato (B4)**<sup>1</sup>, **Kaoru Yamashita (B4)**<sup>1</sup>, **Shuma Abe (B4)**<sup>1</sup>, **Taizo Tominaga (B4)**<sup>1</sup>, Minoru Ashizawa<sup>2</sup>, Hiroki Ishiguro<sup>1</sup>, Naoji Matsuhisa<sup>1,3</sup>

<sup>1</sup> Department of Electronics and Electrical Engineering, Keio University, <sup>2</sup> Department of Materials Science and Engineering, Tokyo Institute of Technology, <sup>3</sup> JST PRESTO

### Poster 2-7 (Poster: English, Language: Japanese)

“High-Gain N-type Organic Transistors Using Source-Gated Structure”

**Henmi Yudai (M)**<sup>1</sup>, Hiroyuki Matsui<sup>1</sup>, Radu A. Sporea<sup>2</sup>, Yasunori Takeda<sup>1</sup>, Shizuo Tokito<sup>1</sup>

<sup>1</sup>. ROEL, Yamagata University, <sup>2</sup>. University of Surrey

**Oral presentation** (Presenters' name is in **bold**.)

**Session 1 15:10-17:00 June 15<sup>th</sup>**

Oral 1-1

“Assessing Mechanical Properties of Skin Using Mechanoacoustic Sensors”

**Md Osman Goni Nayeem (D)**, Chihiro Okutani, Sunghoon Lee, Tomoyuki Yokota, Takao Someya  
Electrical Engineering, The University of Tokyo

Oral 1-2

“Parity-Time (PT) symmetrically resonant coupling system for wearable biosensors”

**Taiki Takamatsu (D)**<sup>1</sup>, Yin Shijie<sup>1</sup>, Te Xiao<sup>1</sup>, Lunjie Hu<sup>1</sup>, Qi Zhang<sup>1</sup>, Takeo Miyake<sup>1</sup>  
1. Graduate School of Information, Production and Systems, Waseda University

Oral 1-3

“Neonatal wearable device for multi-vital detections based on colorimetric method”

**Masaki Shimamura (M)**, Go Inamori, Umihiro Kamoto, Yutaka Isoda, Azusa Uozumi, Yusuke Okubo,  
Shuichi Ito, Hiroki Ota

Oral 1-4

“An ultraflexible organic amplifier for processing electrocardiogram”

**Masahiro Sugiyama (D)**<sup>1,2,3</sup>, Takafumi Uemura<sup>1,3</sup>, Masaya Kondo<sup>1,2,3</sup>, Mihoko Akiyama<sup>1</sup>,  
Naoko Namba<sup>1,3</sup>, Shusuke Yoshimoto<sup>1</sup>, Yuki Noda<sup>1</sup>, Teppei Araki<sup>1,2,3</sup>, Tsuyoshi Sekitani<sup>1,2,3</sup>  
1. SANKEN, Osaka University, 2. Graduate School of Engineering, Osaka University, 3. AIST Photo  
Bio-OIL

## **Session 2 9:20-10:10 June 16<sup>th</sup>**

### Oral 2-1

“Investigation of the direct gold bonding via plasma treatment”

**Masahito Takakuwa (D)**<sup>1,2</sup>, Kenjiro Fukuda<sup>2</sup>, Tomoyuki Yokota<sup>3</sup>, Shinjiro Umezu<sup>1</sup>, Takao Someya<sup>2,3</sup>

1. Waseda university, 2. RIKEN, 3. The University of Tokyo

### Oral 2-2

“H<sup>+</sup>-mediated control of biochemical processes with electrochemical pH modulation”

**Mingyin Cui (D)**<sup>1</sup>, Yukun Chen<sup>1</sup>, Bingfu Liu<sup>1</sup>, Dingxiang Chen<sup>1</sup>, Takeo Miyake<sup>1,2</sup>  
Graduation School of Information, Production and System, Waseda Univ. 1, JST-PRESTO<sup>2</sup>

## **Session 3 14:15-16:05 June 16<sup>th</sup>**

### Oral 3-1

“Polymeric Positive Temperature Coefficient Thermistor with Ultrathin Parylene Encapsulation”

**Chihiro Okutani (Postdoc)**, Tomoyuki Yokota, Ryotaro Matsukawa, Takao Someya  
Electrical Engineering and Information Systems, The University of Tokyo

### Oral 3-2

“A novel semiconducting polymer based on dithienonaphthobisthiadiazole that enables high fill factor of 0.8 with thick organic solar cells”

**Tsubasa Mikie (AP)**<sup>1</sup>, Itaru Osaka<sup>1</sup>

1. Graduate School of Advanced Science and Engineering, Hiroshima University

### Oral 3-3

“Ultra-deformable and tissue-adhesive liquid metal antennas”

**Kento Yamagishi (Postdoc)**<sup>1</sup>, Wenshen Zhou<sup>2</sup>, Terry Ching<sup>1,2,3</sup>, Shao Ying Huang<sup>2</sup>, Michinao Hashimoto<sup>1,2</sup>

1Digital Manufacturing and Design (DManD) Centre, Singapore University of Technology and Design, Singapore 487372, Singapore. 2Engineering Product Development, Singapore University of Technology and Design, Singapore 487372, Singapore. 3Department of Biomedical Engineering, National University of Singapore, Singapore 117583, Singapore.

### Oral 3-4

“Highly efficient and stable ultrathin organic solar cells”

**Sixing Xiong (Postdoc)**<sup>1</sup>, Kenjiro Fukuda<sup>1</sup>, and Takao Someya<sup>1,2</sup>

1. RIKEN, Wako, 351-0198 Saitama, Japan 2. The University of Tokyo, Tokyo, Japan