

20th Anniversary

IMFEDK2022

The 2022 International Meeting for
Future of Electron Devices, Kansai

Photo Album

November 28-30, 2022

Kyoto Avanti Hall & Zoom Online

Keynote Speech 1

Multiple Design Options for SOEN

- Collaborators had multiple design decisions for designing SOEN, including different neuron model implementations
- The key question is which model performs best when implemented on a particular application

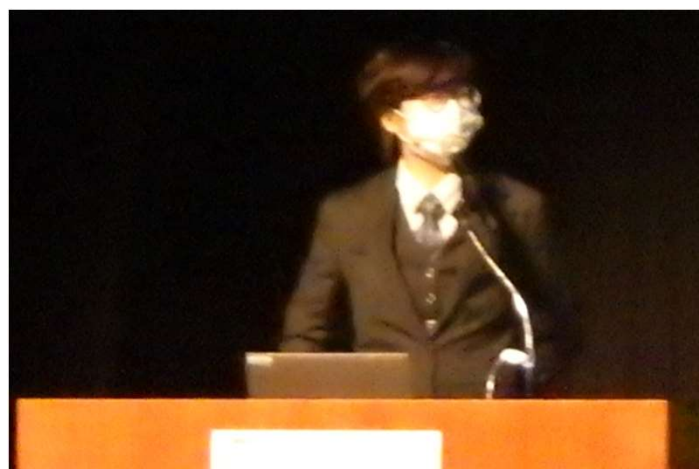
SOEN1

SOEN2

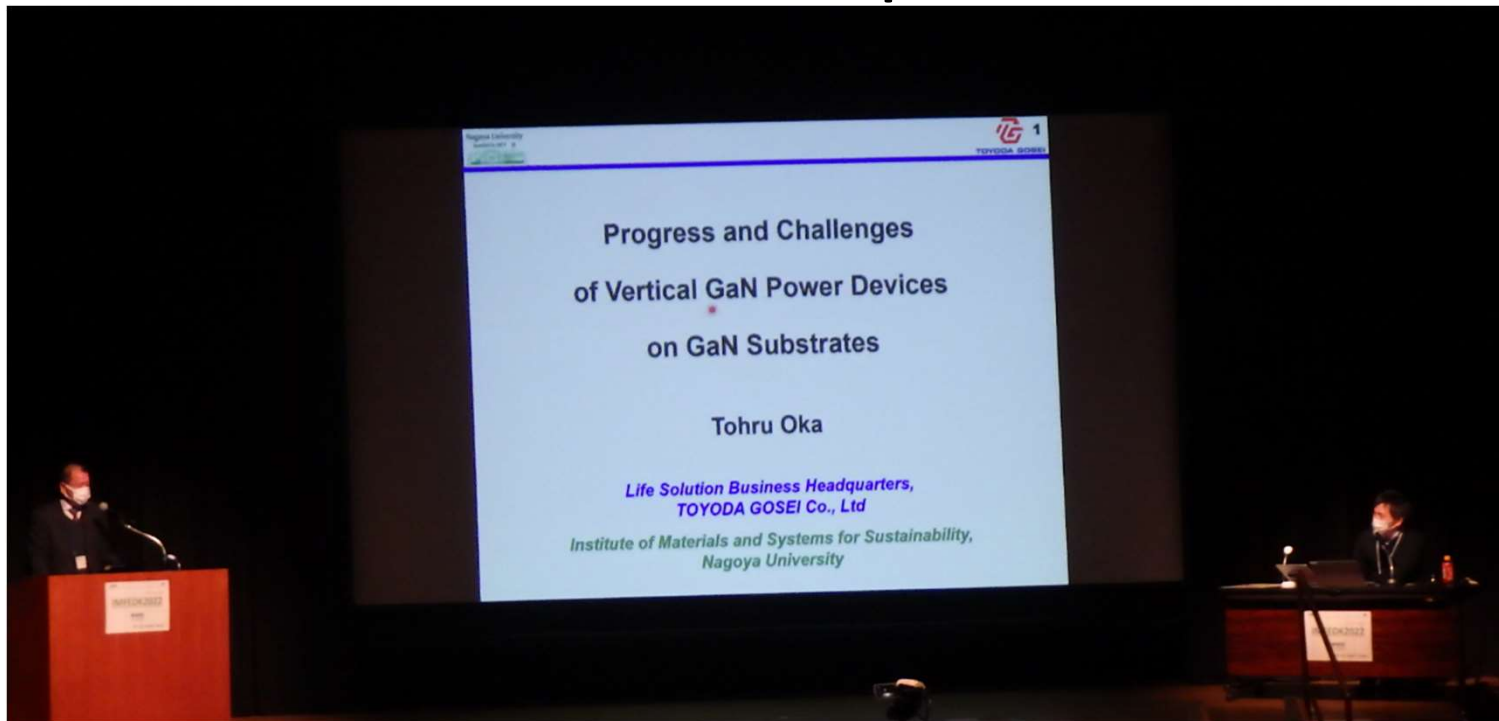
Buckley, Boris, Adam N. McCaughan, Jeff Chiles, Richard P. Mirin, Sae Woo Nam, Jeffrey M. Shainline, Grant Brar, James S. Plank, and Catherine D. Schuman. "Design of superconducting optoelectronic networks for neuromorphic computing." in 2019 IEEE International Conference on Reconfigurable Computing (ICRC), pp. 1-7. IEEE, 2019.



General Session –Emerging 1-



General Session –Compound 1-



General Session - Compound 2 -

Multiple quantum well (QW) by mist-CVD
20 QW Fe₂O₃/Ga₂O₃
Kawaharamura et al, Appl. Phys. Lett. 109, 15166
■ STEM image

■ 20 QW Fe₂O₃/Ga₂O₃

A multiple quantum well α -Fe₂O₃/ α -Ga₂O₃ with parallel and coherent formation of unit and highly single-crystalline layers on a sapphire substrate has been fabricated by mist-CVD



Poster Oral Short Presentation 11/29

P03. The influence of the process parameters on the quality of SiO₂ film for the switching operation of ReRAM devices

Tatsuki Taniyama, Shingo Sato
Kansai University

Standard mechanism of memory operation for ReRAM devices

Typical I-V

SiO₂ is cost effective and high affinity with CMOS process

P03. The influence of the process parameters on the quality of SiO₂ film for the switching operation of ReRAM devices

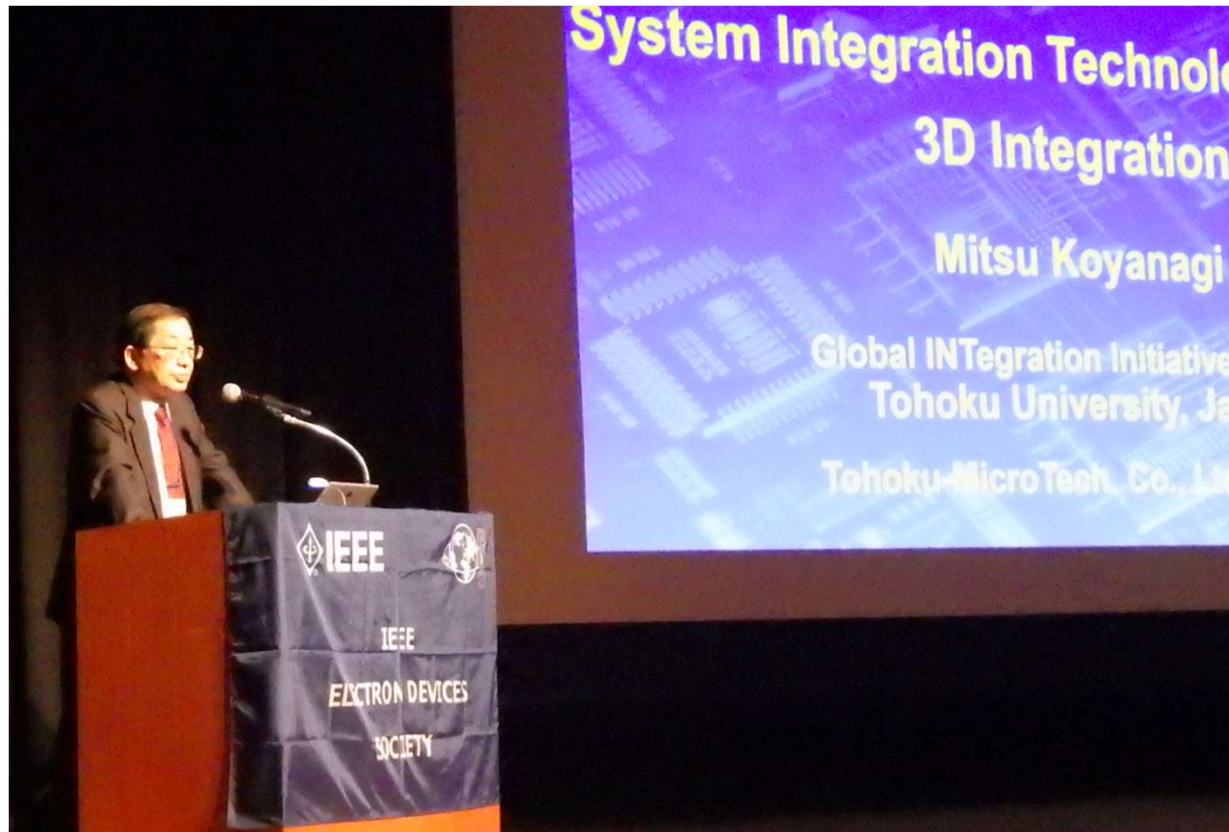
The dependence of Ar gas flow and pressure

Yield and N₂+CO pressure

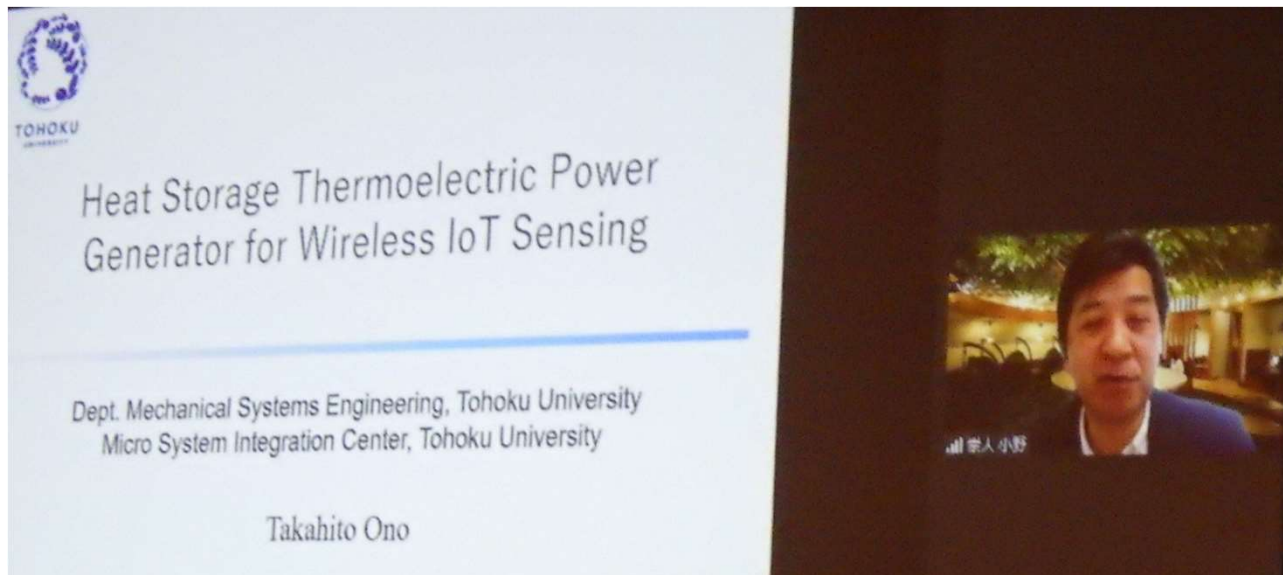
Deposition rate as a function of Ar gas flow and chamber pressure

Switching voltage for 0.5 and 7.0 Pa device

Keynote Speech 2



General Session - Emerging 2 -



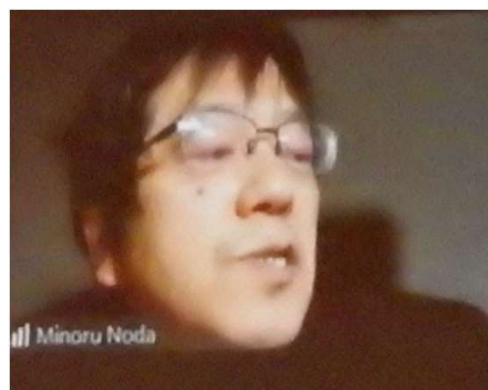
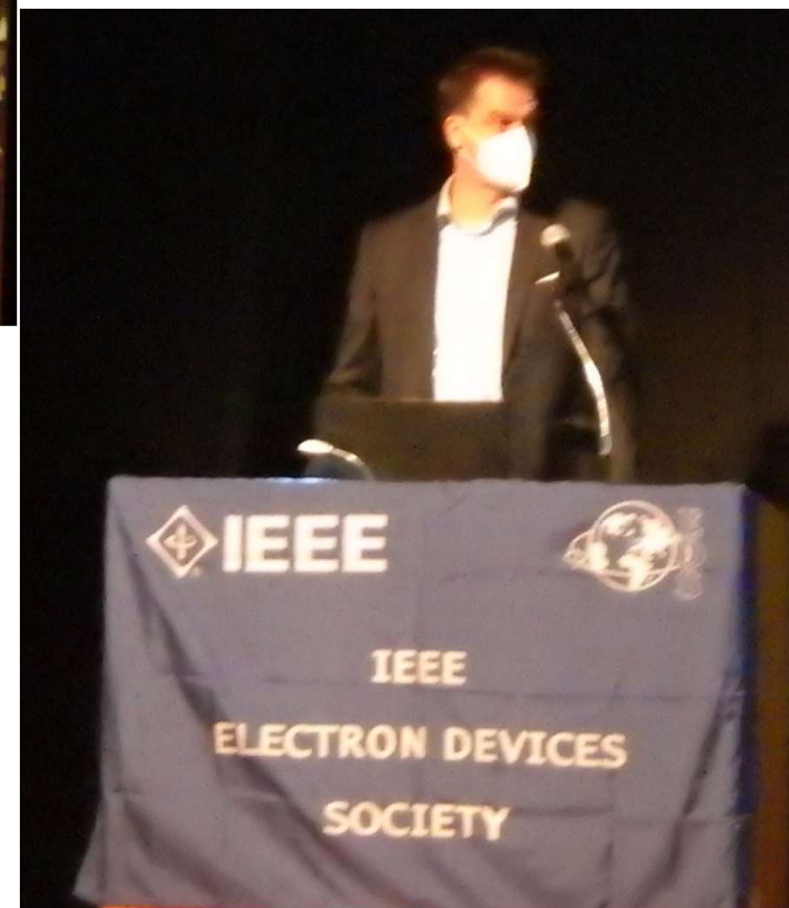
TOHOKU UNIVERSITY

Heat Storage Thermoelectric Power Generator for Wireless IoT Sensing

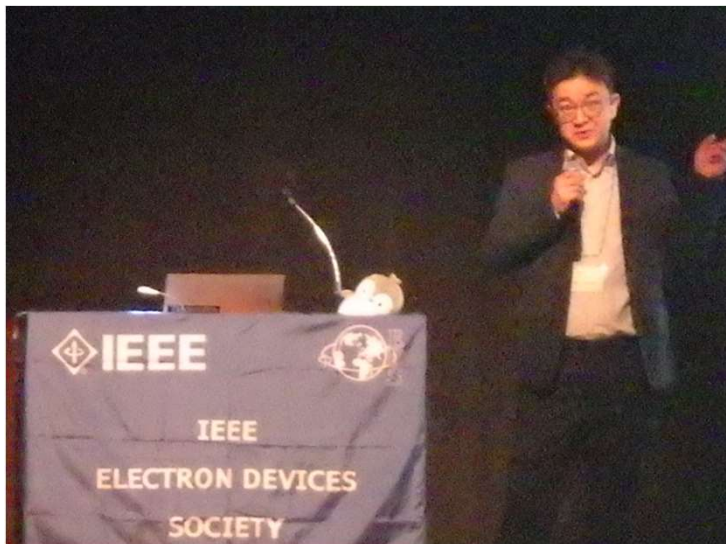
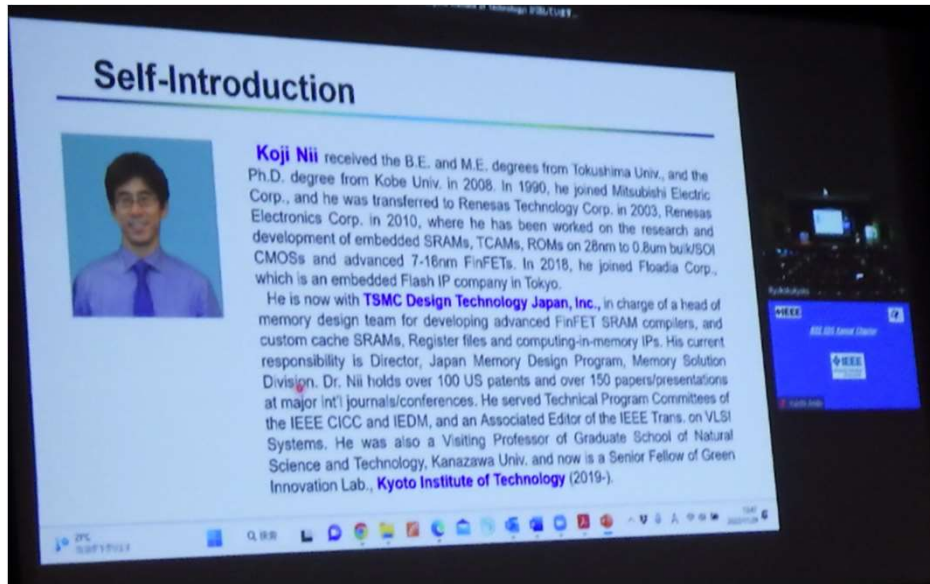
Dept. Mechanical Systems Engineering, Tohoku University
Micro System Integration Center, Tohoku University

Takahito Ono

野人小野



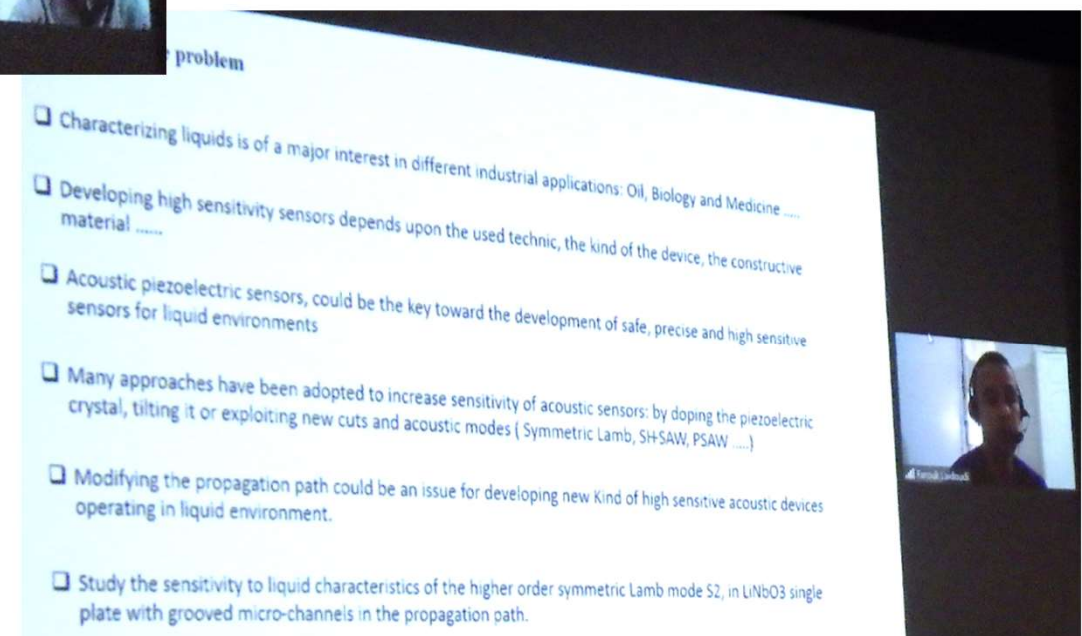
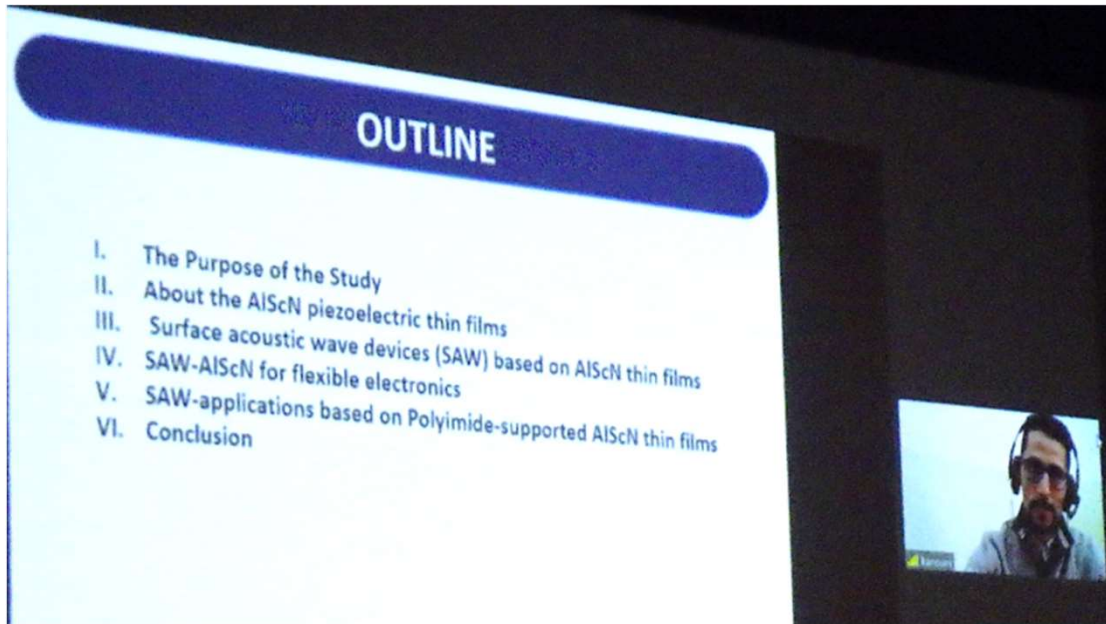
Special Session – Supported by IEEE SSCS Kansai Chapter -



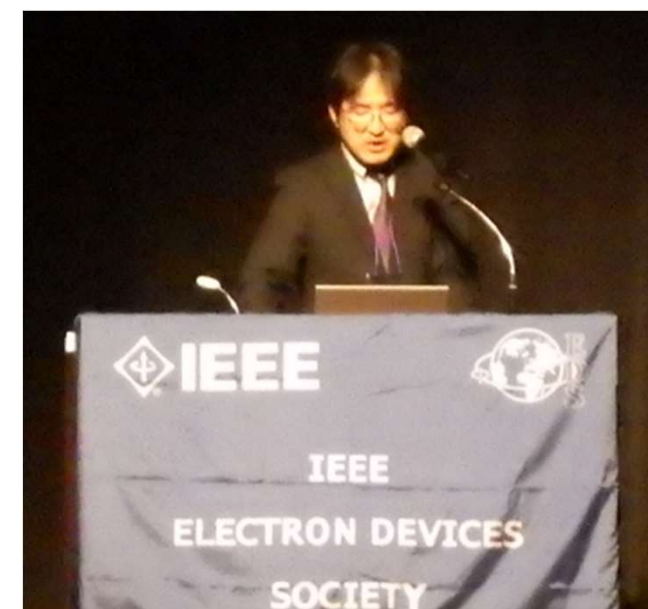
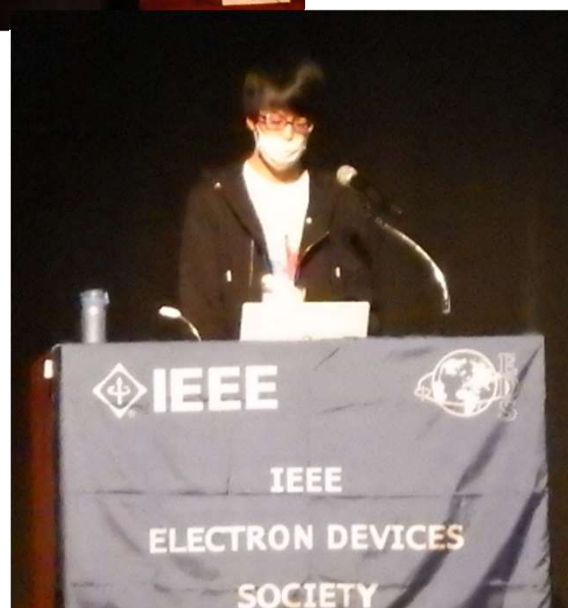
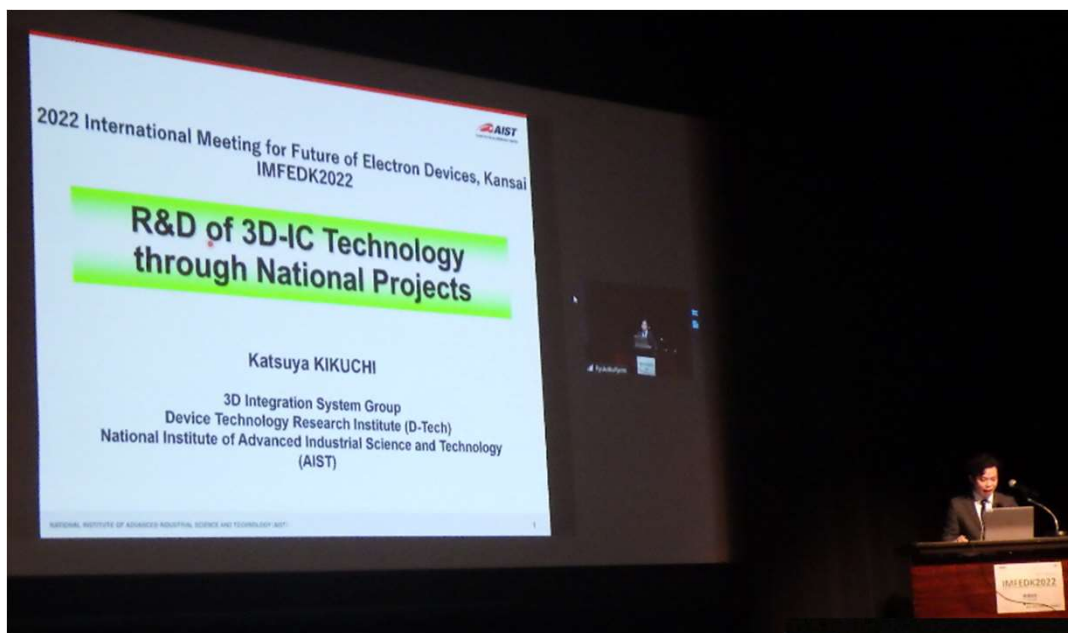
General Session - Silicon 1 -



General Session - Emerging 3 -



General Session - Silicon 2 - 11/30



Special Session

– IMFEDK Celebrating the 20th Anniversary –



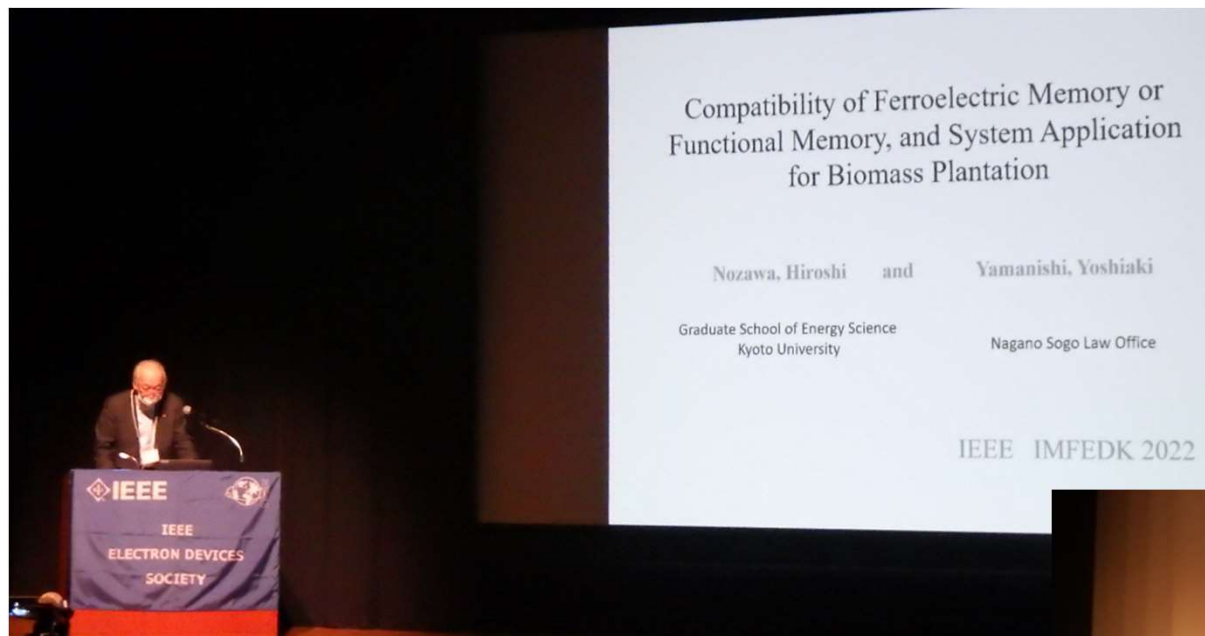
IEEE EDS Kansai Chapter Distinguished Service Award

Hiroshi Nozawa
(Kyoto University)

Daisuke Ueda
(Nagoya University)

Kenji Taniguchi
(Osaka University)





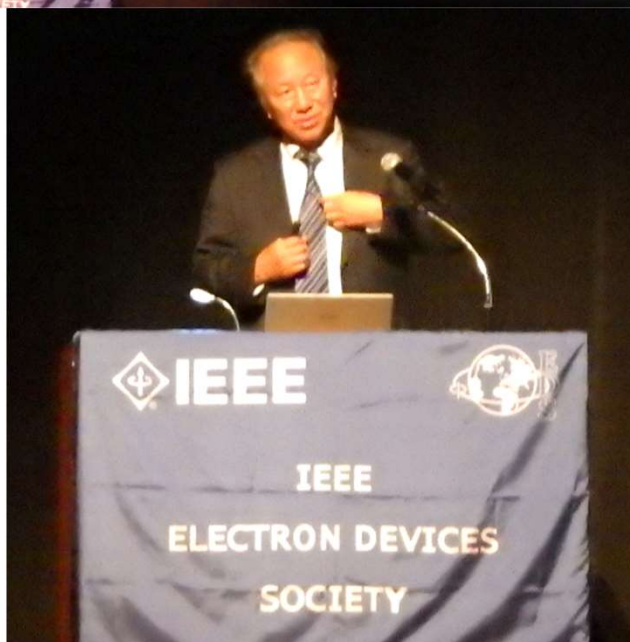


日本の半導体産業は衰退しているか？

概要

1. 技術者としての昔話
2. 垂直統合と水平分業の利害得失
3. 海外との競争条件はどこが違うか？
4. 経営品質、3σ、ISOなどの技術管理は何だったか？
5. 技術的挑戦からの事業化が難しい組織環境
6. 皆さんの技術を事業化してみませんか
7. 展開シナリオを思い描ける技術者像

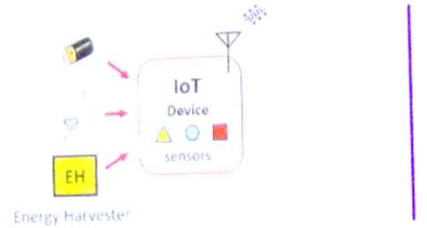
IMFEDK 2022





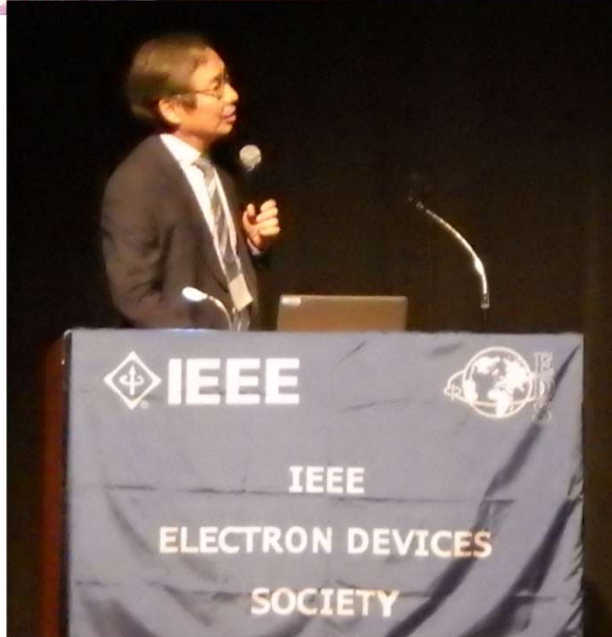
IoTの経済的な効果

2019年 エコノミスト誌
 -インターネットはIoTによって第二フェーズに入った。
 -人工知能(AI)、ビッグデータと並んでIoTは世界のデジタル経済の中心

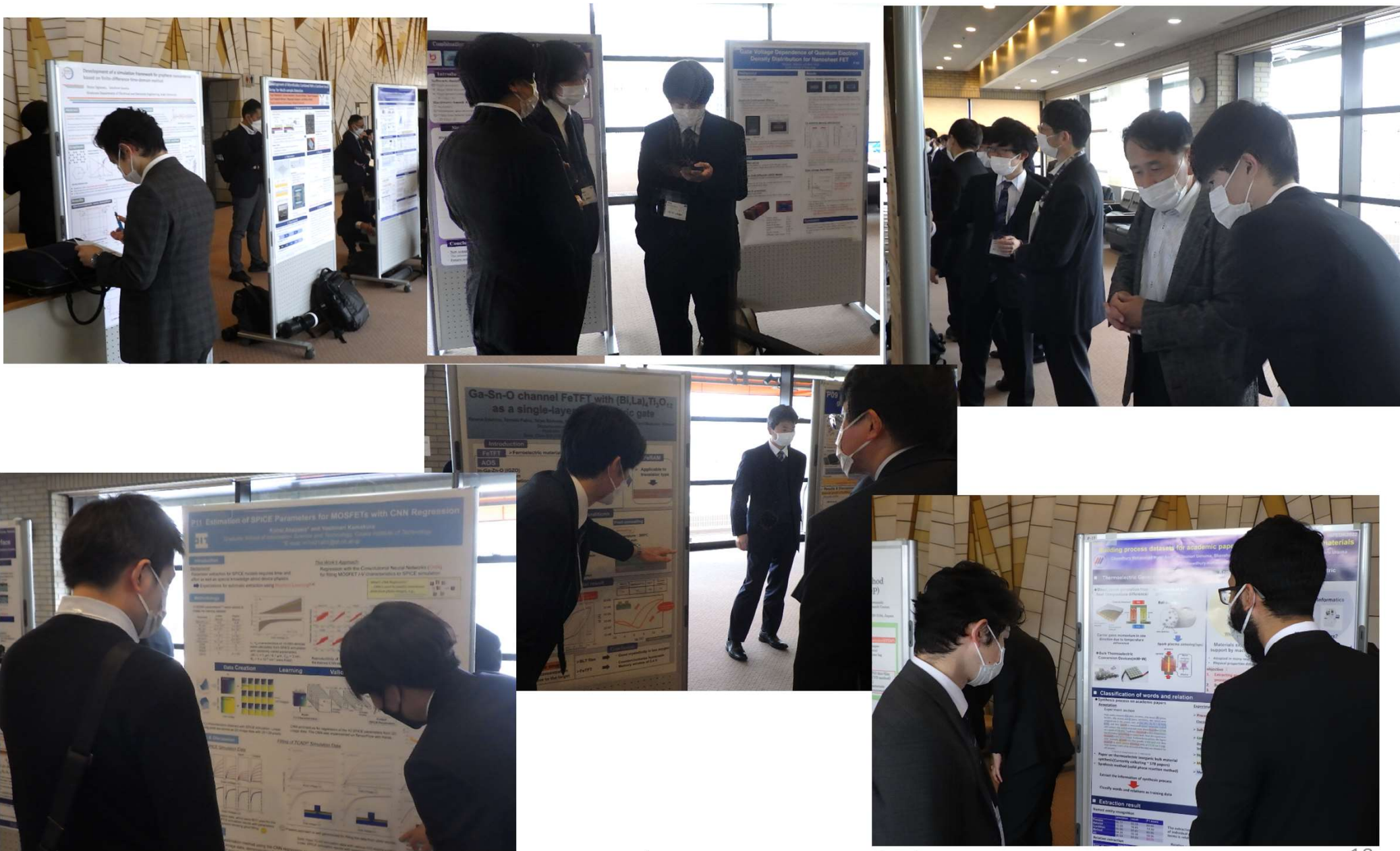


Applications of EH assisted IoT

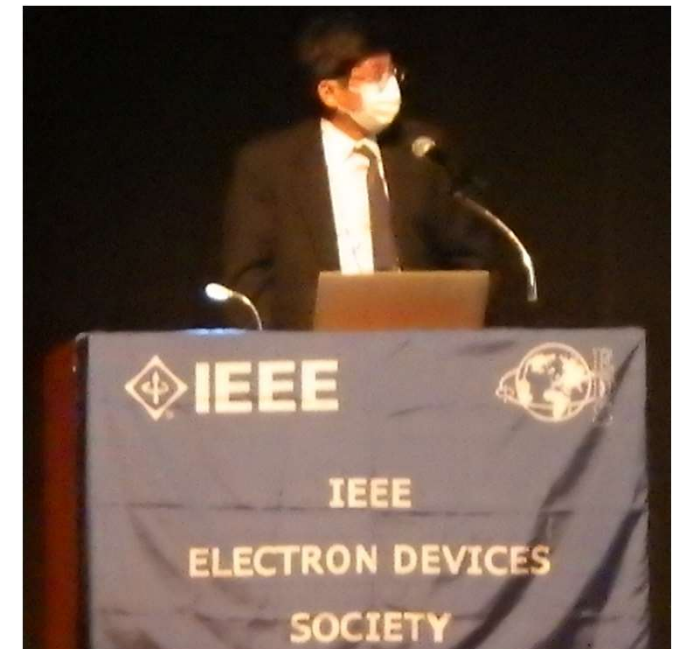
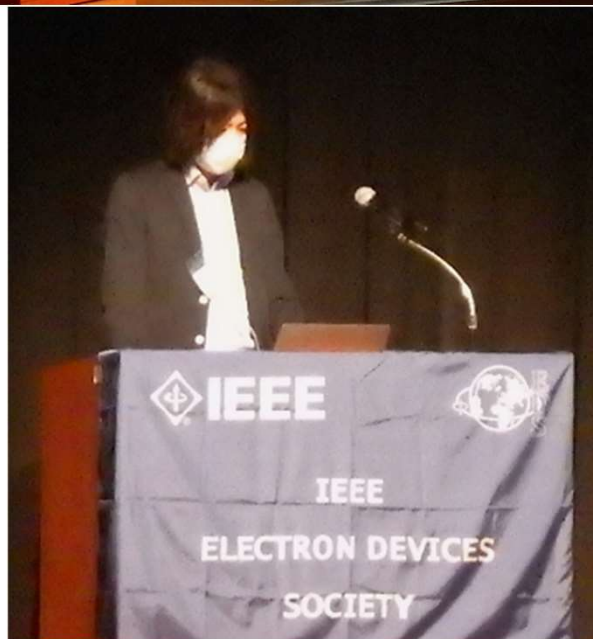
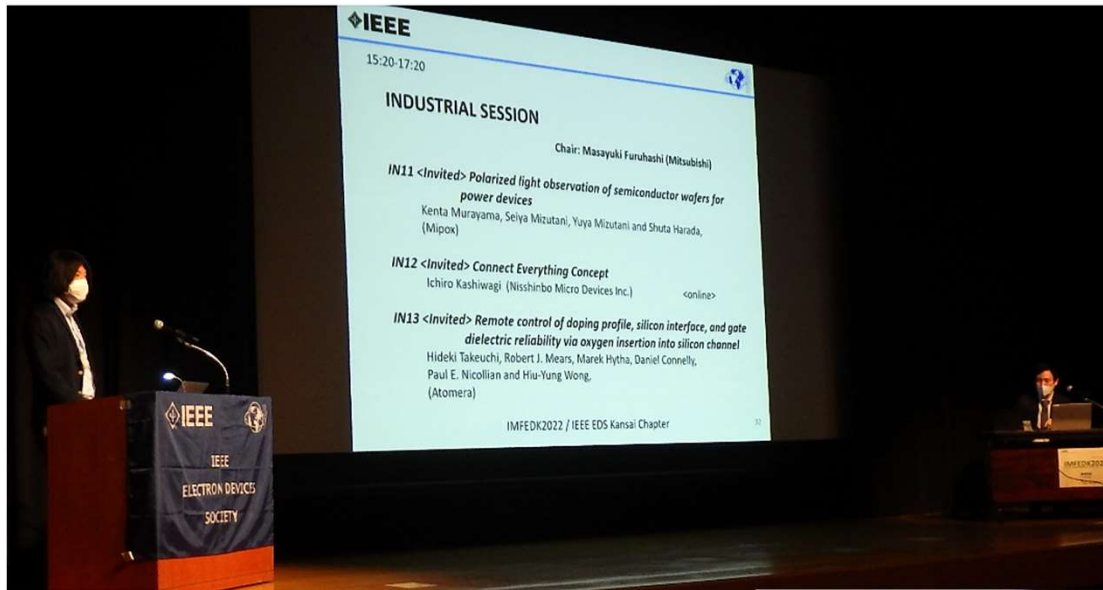
Home	Fire detection, Smoke sensors, Intrusion detection
Retail	Product tracking and Shop check out (RFID tag)
Health	Activity tracker, Fall detect on, Emergency tag
Logistics	Quality of storage and Shipment condition monitoring
Agriculture	Animal tracking(RFID tag), Irrigation monitoring
Factory	Asset tracking, Inventory management (RFID tag)



Poster Viewing and Discussion



INDUSTRIAL SESSION





IEEE EDS Kansai Chapter IMFEDK Most Downloaded Paper Award

**“An 800-MHz 8-bit High Speed SAR ADC
in 16nm FinFET Process”**

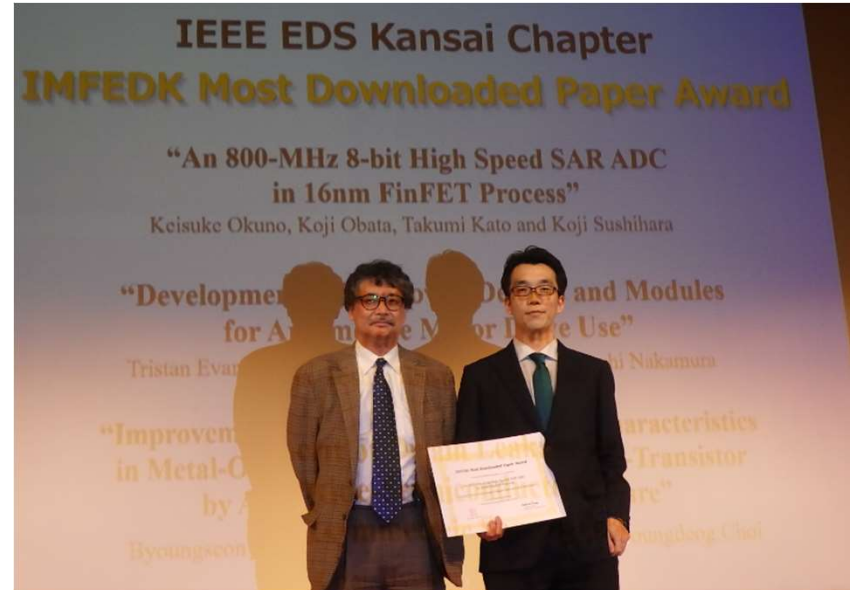
Keisuke [Okuno](#), Koji [Obata](#), Takumi [Kato](#) and Koji [Sushihara](#)

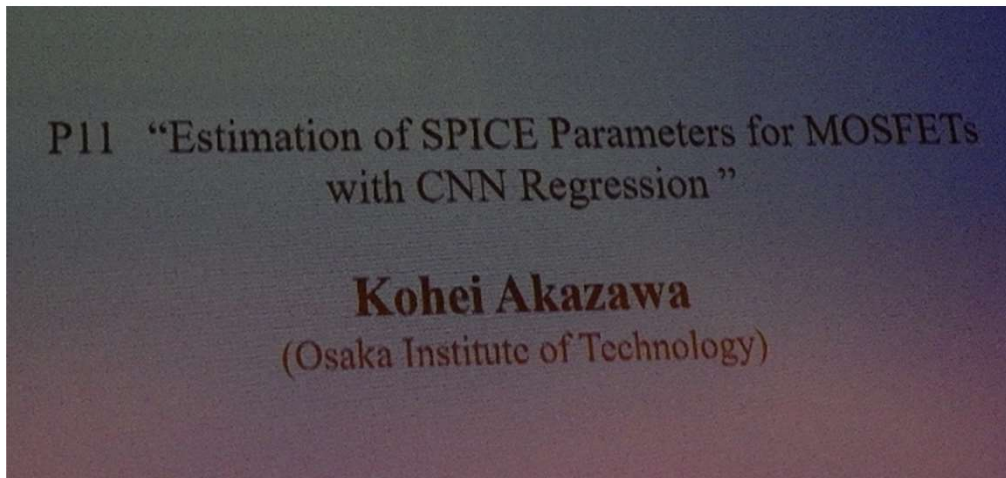
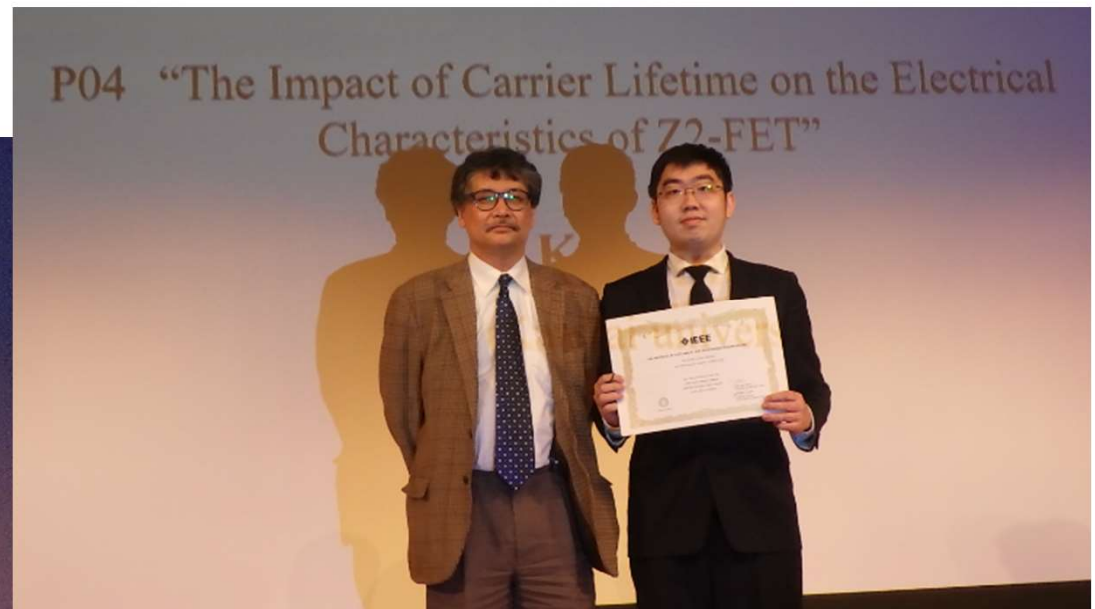
**“Development of SiC Power Devices and Modules
for Automotive Motor Drive Use”**

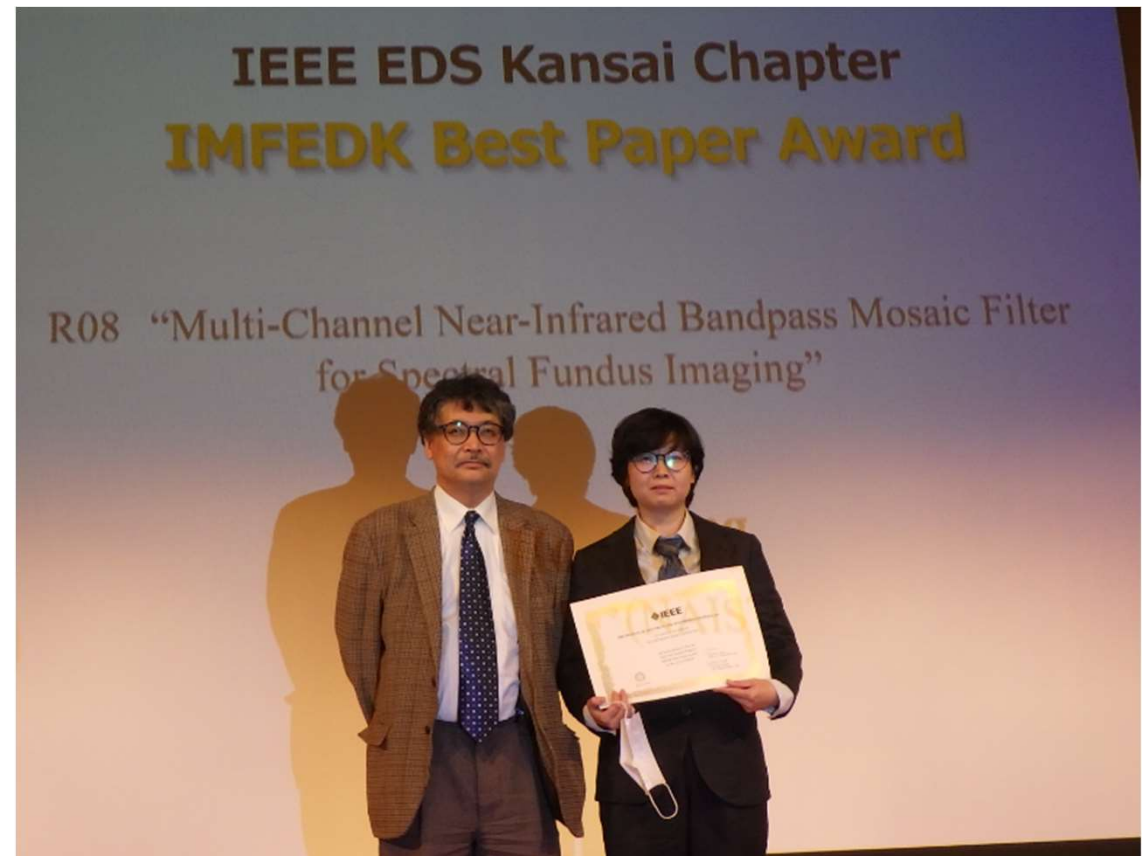
Tristan [Evans](#), Toshio [Hanada](#), Yuki [Nakano](#) and Takashi [Nakamura](#)

**“Improvement of Drain Leakage Current Characteristics
in Metal-Oxide-Semiconductor-Field-Effect-Transistor
by Asymmetric Source-Drain Structure”**

Byoungseon [Choi](#), Hyunae [Park](#), Dongsoo [Kim](#) and Byoungdeog [Choi](#)







Closing Remark



Edited by Yuichi Ando