

This issue includes reports on the 13th Tokyo Section hosted lecture 2022, the technical tour of the Railway Museum and JR East R&D Center, the 2023 LMAG annual general assembly, and a report on the Tokyo Section 1st Lecture Meeting 2023.

### 1. Lecture Meetings hosted by Tokyo Section (co-hosted by LMAG)

#### “Humanoid Robotics and Its Applications”

The 13<sup>th</sup> lecture meeting was hosted by IEEE Tokyo Section TPC and co-sponsored by LMAG-Tokyo, and was held in an online conference format by Zoom Webinar from 3:00 pm on Tuesday, December 13, 2022. The lecturer was Dr. Atsuo Takanishi (Professor, Faculty of Science and Engineering, Waseda University), and there were 42 participants (36 of whom were IEEE members).

In his lecture, he reviewed the history of humanoid robot research initiated by Professor Ichiro Kato and his colleagues at Waseda University in the 1960s, and summarized the process up to the present, including its development into applied research. The history of biped robot development conducted at Waseda University, the display of robots at the Tsukuba Expo in 1985, the dawn of the service robot industry around 1990, bio-mimetic robots, etc. He also gave an easy-to-understand explanation using videos of the development of many other interesting types of robots, including robots for the elderly and disabled, robots for playing piano, flute, saxophone, and other music, robots for expressing emotions, robots for chewing, robots for rehabilitation, and many others.



Fig.1 Dr. Takanishi giving his talk (Zoom screenshot)

### 2. Technical Tours hosted by LMAG-Tokyo

#### “Railway Museum / JR East R&D Center Tour”

A tour and lecture were held on December 14 (Wednesday) from 13:30 to 17:00 at the Railway Museum and JR East Research and Development Center in Saitama City, Saitama Prefecture. 19 people participated. These were hosted by the IEEE Tokyo Section Life Member Affinity Group (LMAG-Tokyo) and co-sponsored by the Tokyo Section TPC.

As this year marks the 150th anniversary of the opening of the railway, a commemorative exhibition titled "150 Years of Travel in Japan Created by Railways" was held. Participants learned about the history from the steam locomotives to the Shinkansen, and future railways vision.

At the JR East Research and Development Center, we toured various testing equipment for safety and security. Furthermore, Railway operations and disaster prevention measures based on early prediction of earthquakes, environmental initiatives such as Zero Carbon 2022 and hydrogen hybrid trains, and initiatives related to transportation systems were introduced.



Fig.2 Group photo of the tour participants and staff at the entrance of the Railway Museum (in front of the Railway Museum building)

### 3. LMAG-Tokyo Annual General Assembly

The 2023 LMAG-Tokyo General Assembly was held on March 17th (Friday) from 14:10 to 14:40 in an online conference format. The assembly was presided by Dr. Sugie, Secretary. After reporting that 30 participants (including 14 online participants) and other 728 LMAG-Tokyo members entrusted to the executive, this year's officers (Dr. Ohta, Chair, Dr. Hayashi, Vice Chair, Dr. Sugie, Secretary) introduced themselves. Following that, Dr. Ohta, Chair, gave a speech and proceeded with the proceedings of the general meeting as chair person. All agendas were deliberated and approved, and the LMAG-Tokyo General Assembly ended successfully. Below is an outline of the proposal.



Fig.3 LMAG-Tokyo Annual General Assembly

#### Agenda 1 : Appointment of officers in 2023

Dr. Hayashi, Vice Chair, reported on the election of officers as follows.

Chair: Naohisa Ohta (former Keio University)

Vice Chair: Hideki Hayashi (Yokohama National University, former Sumitomo Electric)

Secretary: Toshihiko Sugie (Hokkaido University\*, former NTT) \*Tokyo Section resident member

#### Agenda 2 : Report on the 2022 LMAG-Tokyo Activities

Dr. Hayashi, Vice Chair, made the following activity report.

-The 2022 LMAG Annual General Assembly was held online on March 10th.

- Four board meetings were held on-site and online.

- LMAG sponsored or co-sponsored nine lectures mainly online, with a total of 555 participants.

-Technical tours were conducted at Railway Museum/JR East Research and Development Center (December 14<sup>th</sup>, Saitama) and ANA Airplane Maintenance Factory (October 26<sup>th</sup>, Haneda Airport)). These tours were planned two years ago, but have

been postponed due to the Covid 19 pandemic. In addition, tours of the KDDI Yamata Transmitting Station (August 24, Koga) and the JAXA Institute of Space and Astronautical Science (September 29, Sagami-hara) were held.

- Organized by LMAG and co-sponsored by TPC, the Evening Salon "Extended Edition" was held on June 14th. Dr. Tadashi Takano (Professor Emeritus, Institute of Space and Astronautical Science, JAXA) gave a lecture entitled of "Space travel is about to begin: What will Japan do?"

-Other co-sponsored and cooperative events include a lecture hosted by Tokyo Section EA (March 12th), online participation in R10 LMAG Meet (March 26th, June 19th, October 16th), R10 SYWL Congress (August 11th to 14th), JC Metro Area Workshop (MAW) 2022 Shikoku Section (October 7th), Japan SYWL + Industry Workshop 2022 (October 8th), 19th IEEE TOWERS (November 26th).

- The LMAG-Tokyo Newsletter, which reports on our activities, was published three times a year and posted on our website.

- Articles about the activities of LMAG-Tokyo were posted on IEEE LMAG e-Newsletter and R10 Newsletter (Connect).

- We have improved the LMAG-Tokyo Home Page with the cooperation of the Tokyo Section Publication Committee.

- LMAG-Tokyo co-hosted five webinars, including the Educational Activity (EA) activities organized by the Young Professional Affinity Group (YP) of the Tokyo Section.

#### Agenda 3 : Activity Plan for 2023

Dr. Sugie, Secretary, explained the following activity plan for 2023.

-The 2023 LMAG Annual General Assembly is held online (March 17).

- Officers: The activities of LMAG-Tokyo in 2023 will be carried out by the new organization, Chair: Dr. Naohisa Ohta, Vice Chair: Dr. Hideki Hayashi and Secretary: Dr. Toshihiko Sugie.

- Lecture Meetings and Technical Tours: Lectures (sponsored or co-sponsored) are planned more than four times. Technical tours to industrial sites (Japan Agency for Marine-Earth Science and Technology (JAMSTEC)) and to an IEEE Milestones related site, and an evening salon (Lecturer: Dr. Iwao Sasase (Professor Emeritus, Keio University)) are planned.

-Promote participation and exchange with other sections and other Affinity Group events.

-Participate in R10 and LMAG related activities (LMAG Meet, R10 Conference LMAG Track, etc.).

- LMAG-Tokyo Newsletter will be published at least three times a year and will be distributed to LMAG members by e-mail attachment and posted on the website.

-At the beginning of the year, the federation of Tokyo Section Chair and LMAG-Tokyo Chair will send a

congratulatory message to new life members by e-mail.

-Work with the Publication Committee of IEEE Tokyo Section to improve the LMAG-Tokyo Home Page.

All the agenda items were deliberated, and after a Q&A session, all were approved, and the LMAG-Tokyo annual general assembly was successfully completed.



Fig.4 LMAG-Tokyo Officers  
(Center: Dr. Ohta, Chair, Right: Dr. Hayashi,  
Vice Chair, and Left: Dr. Sugie, Secretary)

#### 4. Lecture hosted by Tokyo Section (co-sponsored by LMAG-Tokyo)

The 1st Lecture Meeting 2023 was held after the IEEE Tokyo Section Annual General Assembly (co-sponsored by the LMAG-Tokyo) on March 17 by webinar. The lecturer was Dr. Suguru Kito of Kioxia Corporation, who won the "2021 IEEE Andrew S. Grove Award" jointly with Dr. Hideaki Aochi and Dr. Ryuta Katsumata. The title of the lecture was "Development and Future Prospects of Ultra-High Density 3D Flash Memory". There were 23 participants on-site and 20 online, for a total of 43 persons. Dr. Suguru Kito introduced the history of development from the invention of flash memory in 1987 to its commercialization and the development of 3D flash memory, which has achieved even higher densities. Furthermore, the current status with more than 100 layers and future trends of flash memory were introduced. Today's memory has been realized through ideas and ingenuity, such as memory cell structures that achieve high density and batch processing aimed at cost reduction to reduce the number of processes. It is expected that further progress will be made in the future. A lively discussion took place during the Q&A session.



Fig.5 Dr. Takamishi giving his talk  
(Zoom screenshot)

#### 5. Future Events

LMAG-Tokyo is planning to hold the following events while paying attention to corona countermeasures. Details will be announced at a later date.

- May 25 (Thursday): LMAG Evening Salon (hosted by LMAG, co-sponsored by TPC, YP, WIE), Hybrid format (online & on-site) at Kikai Shinko Kaikan.
- June 27 (Tuesday): LMAG lecture (sponsored by LMAG, co-sponsored by TPC), online.

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