



In this issue, new LMAG-Tokyo officers for 2019-2020 term, two lecture meetings, and the technical tour to Japan Automobile Research Institute (JARI) are reported.

1. LMAG-Tokyo officers for 2019-2020 term

Since the term of LMAG-Tokyo officers ends at the end of 2018, we announced the candidates of new officers for 2019 - 2020 term as of October 5, 2018. Also, the proposal of additional candidate was solicited until 20th October, but there was no proposal. Then, the election was omitted, and the following announced candidates became the LMAG-Tokyo officers for 2019 – 2020 term.

- Chair Prof. Tadashi Takano, formerly JAXA
- Vice Chair Prof. Hajime Imai, formerly Japan Womens University
- Secretary Prof. Nohisa Ohta, formerly Keio University

2. Lecture Meetings

2.1 Lecture Meeting on “Innovation Brought by New Video Technology” ~Images floating in space extend human functions~

The lecture meeting co-sponsored by TPC and LMAG was held from 15:00 to 17: 00 on November 8, 2018, Thursday, at Toshiba Science Museum with 45 participants. The lecturer was Dr. Haruhiko Okumura, Senior Fellow, Media AI Laboratory, Toshiba R&D Center. Prior to the lecture, we also visited the exhibition room of the museum from 14:00.

At the beginning, the outline of the museum’s activities were introduce by Ms. Iwakiri, Director of the museum, including young people development activities such as the Boys and Girls Invention Club based on the concept of "together with people and science".

Dr. Okumura's lecture was mainly the R&D history of the liquid crystal display and the 3D display as well as the innovation toward 4D display.

Currently widely used liquid crystal displays are based on the principle that the transmittance of the liquid crystal is controlled by the video signal. But, in the early stages of development around 1990, the slow response speed of liquid crystal transmittance was the biggest challenge. To solve this problem, Dr. Okumura devised an overdrive technology to

improve the response speed and successfully put it into practical use. With this technology, a television set with liquid crystal was realized for the first time in the world. In 2003 Toshiba brought the 32-inch liquid crystal television to the market, and now the liquid crystal television has become widespread globally, and used various applications including flat TV receivers.

Regarding the next 3D display, his group has developed HDM (Head Mounted Display) suitable for high reality VR (Virtual Reality). They have found experimentally that monocular type is suitable for 3D display, and they are currently conducting R&D on head-up display for AR (Augmented Reality) where its effect can be worked well. The lecture enhanced expectation for future wearable display.



Fig.1 Dr. Okumura giving his lecture.



Fig.2 Tour at Toshiba Science Museum.

2.2 Lecture Meeting on "Basic concept of complex-valued neural networks and future development: From global AI to extremely low power consumption neuro devices"

This lecture meeting sponsored by TPC of IEEE Tokyo Section and cosponsored by LMAG-Tokyo, and cooperated by IEICE Tokyo Section was held on December 10, 2018, Monday, at Kikai-Shinko Kaikan, B3, Room Kenshu1 with 50 participants. Lecturer was Prof. Akira Hirose, University of Tokyo.

He began to introduce that the complex-valued neural network in dealing with the complex amplitude was the coherent network of treating the phase data consistently.

The photographs of the Earth's surface sent from the satellite are utilized for the weather forecast. However, the continuous forecast is sometimes difficult due to light blockage by cloud. Microwave propagation was not influenced by the cloud. The observation of microwave from the satellite was able to compensate for shortcoming of lightwave. Amplitude, phase, and polarization of scattered microwave at the Earth's surface were measured to obtain the real image of the surface. We can monitor the conditions of volcano, earthquake, flood, glacier, and polar ice and snow to estimate the global warming,

The neural networks which reflected the physics of microwave propagation was well utilized for processing the digital data to obtain smooth conjunction between the adjacent data. The amplitude and the phase of the reflected microwave corresponded to the height and the slope of the surface, respectively. The surface photograph was divided into small grid-like sections. The measured data of each segment were processed to obtain the image free from singularities.



Fig.3 Prof. Hirose giving his talk

Then, he introduced novel ultra-small devices. On the surface layer of the multiple thin layers, the eddy current is induced using spin effect. By measuring the eddy current corresponding to the electron spin, the spin wave reservoir computing was expected to be realized.

During and after the lecture, a lot of questions arose from the floor. So, the meeting ended with hot activity.

3. Technical tour to Japan Automobile Research Institute,

LMAG-Tokyo held a technical tour to Japan Automobile Research Institute (JARI) on Tuesday, December 25, between 13:30 to 19:00.

The participants amounted to 26. They met at Kenkyu-gakuen Station of Tsukuba Express, and moved to the venue by an arranged microbus.

At 401 conference room in the main building, Prof. Nagai, the president of JARI, made a welcome address, and the outline of JARI was introduced using a video.

Then, the participants visited the following facilities of the institute.

(1) Augmented Reality Vehicle (ARV)

They got on a test car that was manufactured as a trial for preventive safety aiming at automatic drive in the future, and felt real that the image taken by a camera at the front is correspondent to a real view.

(2) Test Field for Active Safety (Jtown)

This is a test site of peculiar environment, which realizes severe environment while a car running. They experienced the state with invisibility due to fog, and rainfall states of 30 mm/h and 80 mm/h.

(3) High-speed oval track

They experienced 45 deg bank in a remaining part of the track. The whole oval track was moved to Jori town.

(4) Side collision test area and Dummy chamber in Collision test field

They were shown a generator of acceleration force applied to a human body in a collision, and human dummies to evaluate damage to human bodies. Dummy puppets are made in Europe and America, and enable to evaluate precisely from a head to feet.

(5) Chassis Dynamometer

This is used to analyze exhaust gas from cars. A device to gather exhaust gas while an engine



Fig.4 Group photo of participants.

driven, and a device to analyze gases from paint of a new car were shown.

(6) Health Effects Research Program

The analysis result of various gases contained in exhaust gas from a car, and the influence assessment of fine particles from diesel engines were explained.

After a series of visits, the participants returned to the conference room, and had questions. As there are hot topics in relation to cars such as automatic drive and electric vehicles, eager questions and thorough answers were raised to make meaningful discussion.

Then, a social gathering party was held with a presence of the JARI head Nagai. They had more questions and exchange between participants, and made the technical tour even more meaningful.

4. Near future events

General assemblies of LMAG-Tokyo, and IEEE Tokyo Section will be held as is following. LMs would be encouraged to attend.

Date : March 27 (Wednesday), 2019.

Place : Kikai-shinko Kaikan, Room 66 on the 6th fl.

Schedule:

14:00~14:30 General assembly of LMAG-Tokyo

14:30~15:30 General assembly of IEEE Tokyo Section

15:30-16:00 Award ceremony of new Fellows

16:00~ 17:00 Commemoration lecture

from 17:00 Social gathering party

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