



# **Program**

**The Joint International Conference of the 5th  
AGILEHAND Plenary Meeting & 2024 IEEE/CAA**

**Journal of Automatica Sinica Conference**

**Hachioji, Tokyo, Japan  
December 2-6, 2024**

Tokyo University of Technology  
AgileHand Project  
IEEE/CAA Journal of Automatica Sinica  
FUJI TECHNOLOGY PRESS LTD.  
IEEE IES Technical Committee on Human Factors  
Hachioji MICE



# APM&JAS 2024 Program

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**December 2 (Monday):** Registration

**14:00 ~ 17:00:** Registration (Research Building C-104, Hachioji Campus, TUT)

**December 3 (Tuesday):** Registration, Agilenhand plenary meetings, Welcome reception

**09:00 ~ 12:00:** Registration (LEB hall, Hachioji Campus, TUT)

**12:00 ~ 13:30:** Lunch (Student Canteen, 4F, ROSE Kitchen A and B, Hachioji Campus, TUT)

**14:00 ~ 17:00:** Agilenhand plenary meetings 1-4 (LEB 207, Hachioji Campus, TUT)

**18:00 ~ 20:00:** Welcome reception (Shirokiya, Hachioji)

**December 4 (Wednesday):** Agilenhand plenary meetings and APM&JAS

**09:00 ~ 11:30:** Agilenhand plenary meeting 5-8 (LB D 301, Hachioji Campus, TUT)

**11:30 ~ 12:45:** Lunch (Student Canteen, 4F, ROSE Kitchen A and B, Hachioji Campus, TUT)

**12:45 ~ 13:00:** Group photo (12:45 meet in Student Canteen, Hachioji Campus, TUT)

**13:00 ~ 17:30:** APM&JAS (LEB 402 and 403, Hachioji Campus, TUT)

**18:00 ~ 20:00:** Gala dinner (Nihonkaku)

**December 5 (Thursday):** Technique visit and culture visit

**09:00 ~ 11:30:** TUT Hachioji Campus Technique visit (08:50 meet at the entrance of Research Building C)

**11:30 ~ 12:20:** Lunch (Student Canteen, 4F, ROSE Kitchen A and B, Hachioji Campus, TUT)

**12:20 ~ 13:00:** Campus visit

**13:00 ~ 16:30:** Culture visit (Mt. Takao)

**17:00 ~ 19:00:** Dinner (Ukai Toriyama, Asakawa, Hachioji)

**December 6 (Friday):** Industrial visit (08:50 meet at the entrance of KEIO Plaza Hotel Hachioji)

**09:00 ~ 11:30:** Industrial visit (Shimada Electric Manufacturing Company)

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LEB: Learning and Experiment Building (講義実験棟)

LB D: Learning Building D (講義棟 D)

## **Free Wifi for the conference:**

SSID (for 5 GHz standard): **TEUES24-5G**

SSID (for 2.4 GHz standard): **TEUES24-24G**

Key (for both 5 GHz and 2.4 GHz): **Guest&N29T**

# Plenary Lecture

**Plenary Lecturer:**

**Professor Qing-Long Han**

**Pro Vice-Chancellor (Research Quality), Swinburne University of Technology, Australia**

**Title: Dynamic Event-Triggered Distributed Coordination Control**

**Abstract:** Distributed coordination control is the current trend in networked systems and finds prosperous applications across a variety of fields, such as smart grids and intelligent transportation systems. One fundamental issue in coordinating and controlling a large group of distributed and networked agents is the influence of intermittent inter-agent interactions caused by constrained communication resources. Event-triggered communication scheduling stands out as a promising enabler to strike a balance between the desired control performance and the satisfactory resource efficiency. What distinguishes dynamic event-triggered scheduling from traditional static event-triggered scheduling is that the triggering mechanism can be dynamically adjusted over time in accordance with both available system information and additional dynamic variables. This talk provides an up-to-date overview of dynamic event-triggered distributed coordination control. The motivation of dynamic event-triggered scheduling is first introduced in the context of distributed coordination control. Then some techniques of dynamic event-triggered distributed coordination control are discussed in detail. Implementation and design issues are well addressed. Furthermore, this talk exemplifies two applications of dynamic event-triggered distributed coordination control in the fields of microgrids and automated vehicles. Several challenges are suggested to direct future research.



Professor Han is Pro Vice-Chancellor (Research Quality) and a Distinguished Professor at Swinburne University of Technology, Melbourne, Australia. He held various academic and management positions at Griffith University and Central Queensland University, Australia. He received the Ph.D. degree in Control Engineering from East China University of Science and Technology in 1997.

Professor Han was awarded the 2024 IEEE Dr.-Ing. Eugene Mittelmann Achievement Award (the Highest Award in Industrial Electronics), the 2021 Norbert Wiener Award (the Highest Award in systems science and engineering, and cybernetics), the 2021 M. A. Sargent Medal (the Highest Award of the Electrical College Board of Engineers Australia), the IEEE Systems, Man, and Cybernetics Society Andrew P. Sage Best Transactions Paper Award in 2022, 2020, and 2019, respectively, the IEEE/CAA Journal of Automatica Sinica Norbert Wiener Review Award in 2021, and the IEEE Transactions on Industrial Informatics Outstanding Paper Award in 2020.

Professor Han is a Member of the Academia Europaea (The Academy of Europe) (MAE). He is a Fellow of The Institute of Electrical and Electronics Engineers (FIEEE), a Fellow of The International Federation of Automatic Control (FIFAC), an Honorary Fellow of The Institution of Engineers Australia (HonFIEAust), and a Fellow of The Chinese Association of Automation (FCAA). He is a Highly Cited Researcher in both Engineering and Computer Science (Clarivate). He has served as an AdCom Member of IEEE Industrial Electronics Society (IES), a Member of IEEE IES Fellows Committee, a Member of IEEE IES Publications Committee, Chair of IEEE IES Technical Committee on Networked Control Systems, and the Co-Editor-in-Chief of IEEE Transactions on Industrial Informatics. He is currently the Editor-in-Chief of IEEE/CAA Journal of Automatica Sinica and the Co-Editor of Australian Journal of Electrical and Electronic Engineering.



# Keynote

## Keynote Speaker:

**Yuki Nakagawa**  
**CEO of RT Corporation**

## **Title: Transforming Light-Task Automation with AI and Robotics for Food Factories**

**Abstract:** The integration of humanoid robots with advanced AI technologies has opened new frontiers in light-task automation within food factories.

This presentation explores how humanoid robots, equipped with cutting-edge sensors and embodied AI algorithms, are transforming the food industry by performing tasks that traditionally require human dexterity and decision-making. Focusing on applications across the food supply chain, including primary processing, manufacturing, and service industries, we will highlight the development and deployment of humanoid robots capable of collaborating seamlessly with humans.

By examining case studies and recent advancements, this talk aims to provide the future of task automation and its broader implications for both academia and industry.



Yuki Nakagawa is the founder and president of RT Corporation. RT was raised in 2005 for education and factory automation with AI and robotics. She is also the executive director of the New Technology Foundation, which organizes Micromouse, a maze analysis robot contest, and ROS society as a board member of ROSConJP (from 2018) and Open Robotics (USA, from 2022), a general incorporated association in Japan. In 2020, she received the Strait of Magellan Award. In 2022, she was certified as a fellow of robot education and food robotics from the Robotics Society of Japan. Since 2024, IEEE RAS industrial advisory group member.

## APM&JAS 2024 Program (4 December, Wednesday)

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**12:45: Meet in Student Canteen, 4F, ROSE Kitchen B, Hachioji Campus, TUT**

**12:45 ~ 13:00: Group photo**

**13:00 ~ 13:10: Opening Ceremony (Room: LEB 402)**

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**13:10 ~ 13:40 Plenary Lecture (Room: LEB 402)**

**Title: Dynamic Event-Triggered Distributed Coordination Control**

**Speaker: Qing-Long Han**

**Chair: Ciarapica Filippo Emanuele**

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**13:40 ~ 14:00 Keynote (Room: LEB 402)**

**Title: Transforming Light-Task Automation with AI and Robotics for Food Factories**

**Speaker: Yuki Nakagawa**

**Chair: Mihoko Niitsuma**

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**14:00 ~ 15:40 Technical Section 1 (Room: LEB 402)**

**Co-Chairs: Ruben Costa and Yuki Ueno**

**14:00 ~ 14:20**

High Precision Tracking Control for Rotational Systems by Spatial Equivalent-Input-Disturbance Repetitive Control

Yujian Zhou, Jinhua She

**14:20 ~ 14:40**

A Koopman-based Equivalent-Input-Disturbance Tremor-Suppressing Strategy

Mingyuan Xie, Jinhua She, Zhen-Tao Liu, Daiki Sato, Seiichi Kawata

**14:40 ~ 15:00**

A Robotic Vision System for Automatic Fish Quality Grading and Packaging

Mohamed L. Mekhalf, Saigopal Vasudevan, Jorge S. Calado, Dong Le Anh, Pablo Malvido Fresnillo, Jose Ferreira, Pedro Garcia, Paul Ian Chippendale, Ricardo J. Gonçalves, Jose L. M. Lastra, Fabio Poiesi

**15:00 ~ 15:20**

Posture Estimation and Obstacle Detection by Embedding Distance-Measuring Sensors in a Spherical Mobile Robot

Ryota Nakagawa, Yuki Ueno

**15:20 ~ 15:40**

A Comprehensive Overview of AGILEHAND Architecture and Integration

Mansoor Ahmed, Ruben Costa, Rui Branco, Jorge Calado, José Ferreira, Filippo Ciarapica, Franciso Fraile, Mohamed Mekhalfi

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**15:40 ~ 15:55**

**Coffee break**

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**15:55 ~ 17:15    Technical Section 2 (Room: LEB 402)**

**Co-Chairs: Daisuke Tsubakino and Dalila Antunes**

**15:55 ~ 16:15**

An Algebraic Property of a Stochastic Riccati Equation for a Class of Stochastic LQ Optimal Control

Kento Fujita, Daisuke Tsubakino, Shinji Hara

**16:15 ~ 16:35**

Hierarchical LQ Optimal Control for LTI Systems with Low-rank Physical Interconnection

Daisuke Tsubakino, Shinji Hara

**16:35 ~ 16:55**

Digital Twin-Driven Demand Forecasting for Soft and Deformable Food Products

Laura Lucantoni, Stefano Croci, Giovanni Mazzuto, Severino Perenzoni, Filippo Emanuele Ciarapica, Maurizio Bevilacqua

**16:55 ~ 17:15**

Transforming Workforce Skills, Health, and Safety through Digitalization in Soft Product Manufacturing

Hezam Haidar, Paula Pereira, Margarida Tomás, Filippo Emanuele Ciarapica, Dalila Antunes

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**14:00 ~ 15:40    Technical Section 3 (Room: LEB 403)**

**Co-Chairs: Christophe Normand and Yinli Chen**

**14:00 ~ 14:20**

Peak Factor Method for Predicting Maximum Response and Control Force on Across-Wind Direction for Active Structural Control

Yinli Chen, Ryuki Kamano, Daiki Sato, Kou Miyamoto

**14:20 ~ 14:40**

Exploring Dataset Generation Methods for Instance Segmentation: Application for Stacked Meat Products

Hoang Pham, Dong Le, Pablo Malvido Fresnillo, Saigopal Vasudevan, Jose L. Martinez Lastra

**14:40 ~ 15:00**

Human-Robot Collaboration System With Task Prediction and Spatial Memory

Kota Tahara, Yuya Sugimoto, Mihoko Niitsuma

**15:00 ~ 15:20**

Equivalent Passive Model for Gain-Scheduling Control of Active Base-isolated Structures with Nonlinear Viscous Dampers

Yunhao Zhang, Daiki Sato, Yinli Chen, Jinhua She, Kou Miyamoto

**15:20 ~ 15:40**

Effect of Noise in Wind Force Estimation Using Equivalent-Input-Disturbance Method for Nonlinear Systems

Razelle Dennise A. Soriano, Daiki Sato, Chen Yinli, Kou Miyamoto

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**15:40 ~ 15:55**

**Coffee break**

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**15:55 ~ 17:15 Technical Section 4 (Room: LEB 403)**

**Co-Chairs: Masami Iwase and Giuseppe Aiello**

**15:55 ~ 16:15**

Development of Cable Laying Robot based on Reconfigurable Single Actuator Wave Mechanism

Yuki Sadasue, Fuga Inagaki, Masami Iwase

**16:15 ~ 16:35**

Development of a Nonverbal Information Analysis System based on Wearable Device

Jiaren Hu, Jinseok Woo

**16:35 ~ 16:55**

Proposal of Mobile Robot-Restrained UAV Trainer

Daichi Arai, Edwardo F. Fukushima

**16:55 ~ 17:15**

Interior Acoustic Control System Using Boundary Vibration with Giant Magnetostrictive Actuator: Experimental Consideration on Installation Point of Actuator for Improvement of Noise Reduction

Wu Wenbao, Yudai Tanaka, Kentaro Sawada, Taro Kato, Ikkei Kobayashi, Jumpei Kuroda, Daigo Uchino, Kazuki Ogawa, Keigo Ikeda, Ayato Endo, Takayoshi Narita, Hideaki Kato

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**17:15 ~ 17:30 Closing Ceremony (Room: LEB 402)**

**18:00 ~ 20:00: Gala dinner (Nihonkaku) (17:30 leave from LEB 402)**

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## **APM&JAS 2024 Program (5 December, Thursday)**

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**09:00 ~ 10:30:** Laboratory visit (08:50 meet at the entrance of Research Building C)

Laboratories: **C106, C107, and C203, Research Building C, Hachioji Campus, TUT**

Lab C106: Light and Energy (Ohkubo)

Lab C107: Land and Sea Mobile Robotics (Fukushima)

Lab C203: Human-Centric Mobility (Woo)

**10:30 ~ 11:30:** Digital Twin Center (**Administration Building, Hachioji Campus, TUT**)

**11:30 ~ 12:20:** Lunch (Student Canteen, 4F, ROSE Kitchen A and B)

**12:20 ~ 13:00:** Campus visit (16F, Katayanagi Research Institute)

**13:00 ~ 16:30:** Mt. Takao (13:00 meet at 16F, Katayanagi Research Institute)

**17:00 ~ 19:00:** Dinner (Ukai Toriyama, Takao) (Leave at 16:30 to Ukai Toriyama)

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## **APM&JAS 2024 Program (6 December, Friday)**

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**09:00 ~ 11:30:** Industrial visit (Shimada Electric Manufacturing Company)

(08:50 meet at the entrance of KEIO Plaza Hotel Hachioji)

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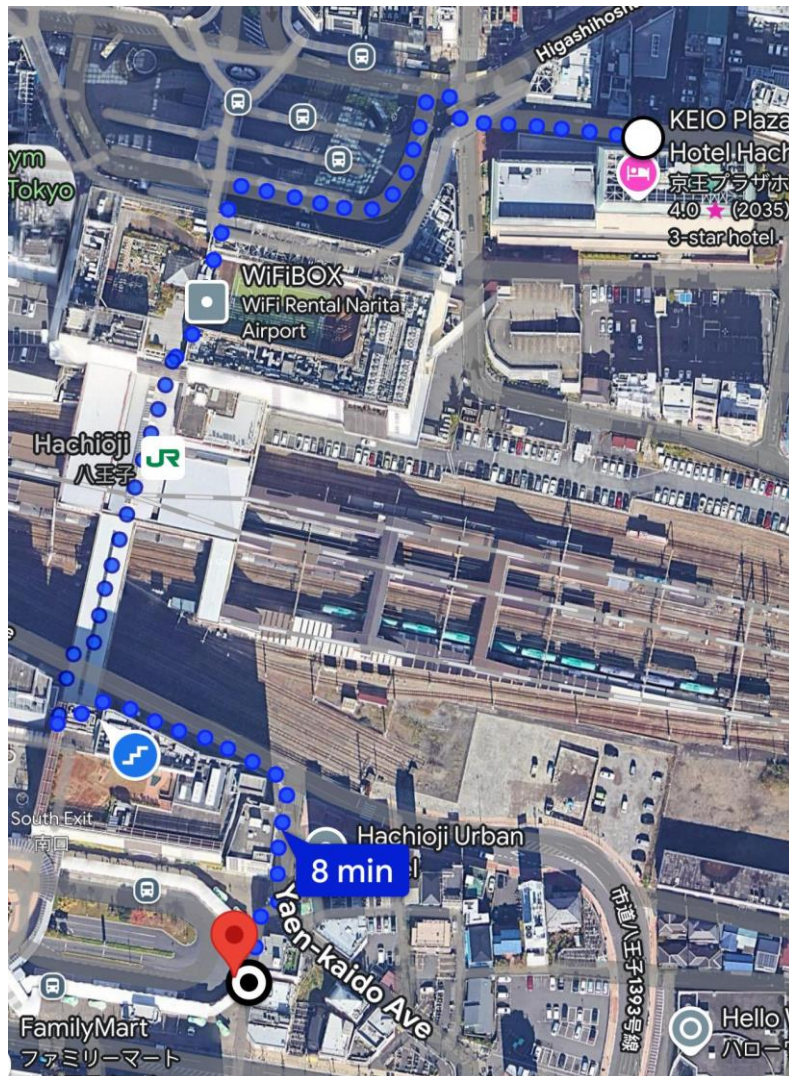
### **Shimada Electric Manufacturing Company**

Established in 1933, this factory in Hachioji manufactures elevator lights, indicators, panels and buttons. While you may never care about the design of an elevator button,, Shimada products are undoubtedly unique and instantly recognizable. On a huge wall, there are more than 1,000 elevator buttons of different shapes and colors that light up when pressed, and you can try to press them all as fast as you can.



## Map

From KEIO Plaza Hotel Hachioji to the school bus stop at JR Hachioji Station (JR Hachioji South Exit, Bus stop 4)



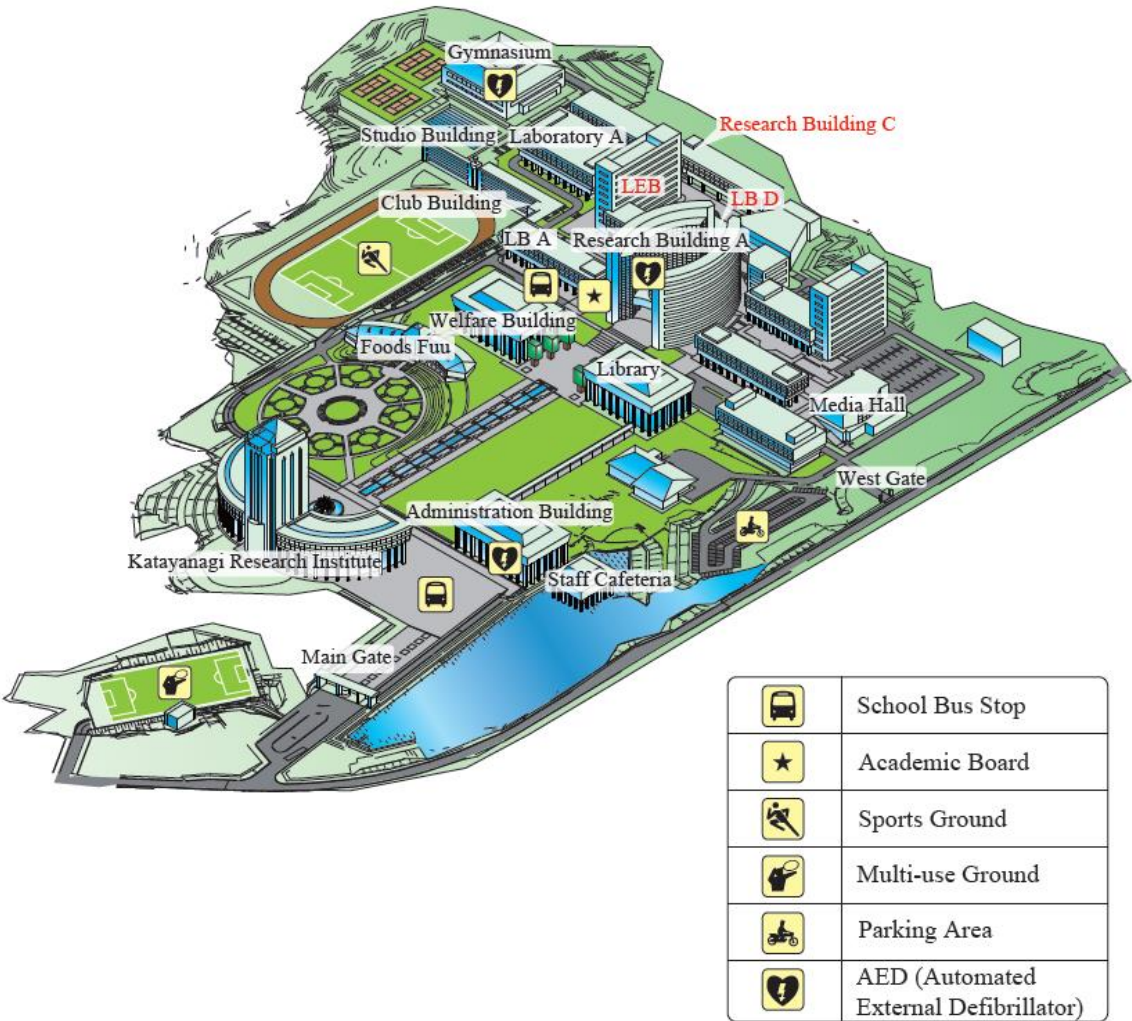
School bus schedule:

[https://www.teu.ac.jp/campus/access/2024\\_0408bus.html#schedule02](https://www.teu.ac.jp/campus/access/2024_0408bus.html#schedule02)

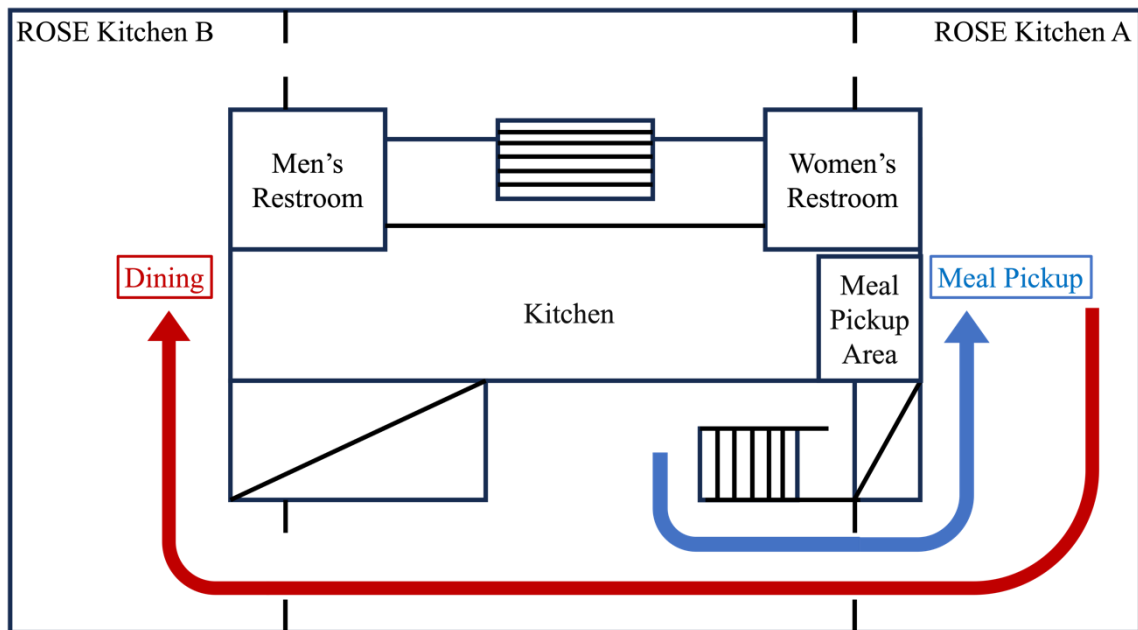


Bus stop 4  
JR Hachioji South Exit

# School Map



## ROSE Kitchen A and B (Student Canteen 4F)



## Procedures for Lunch

**Step 1:** Turn right after entering Student Canteen.

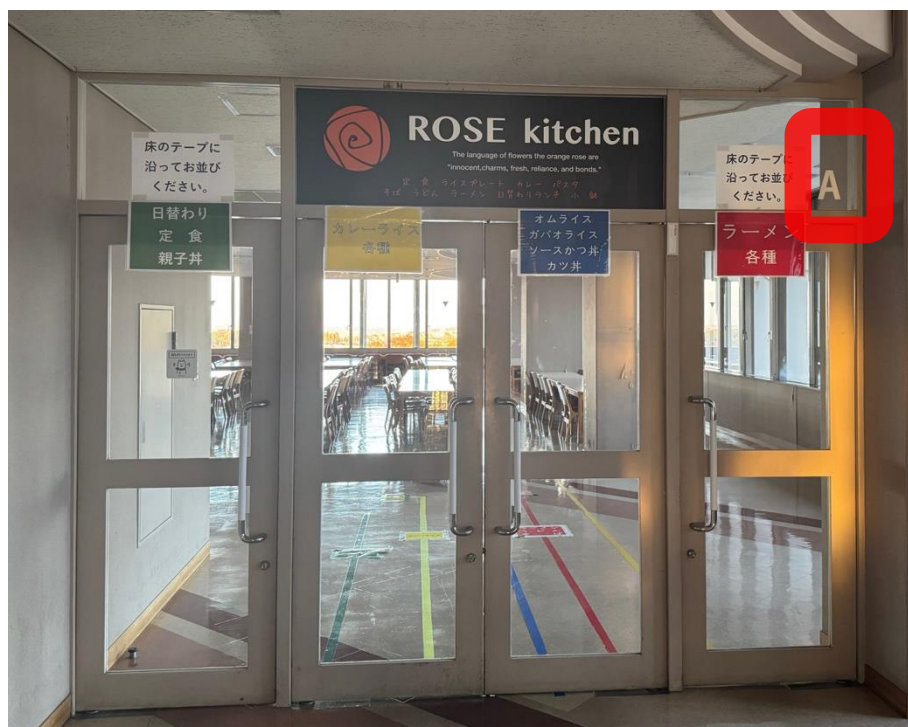




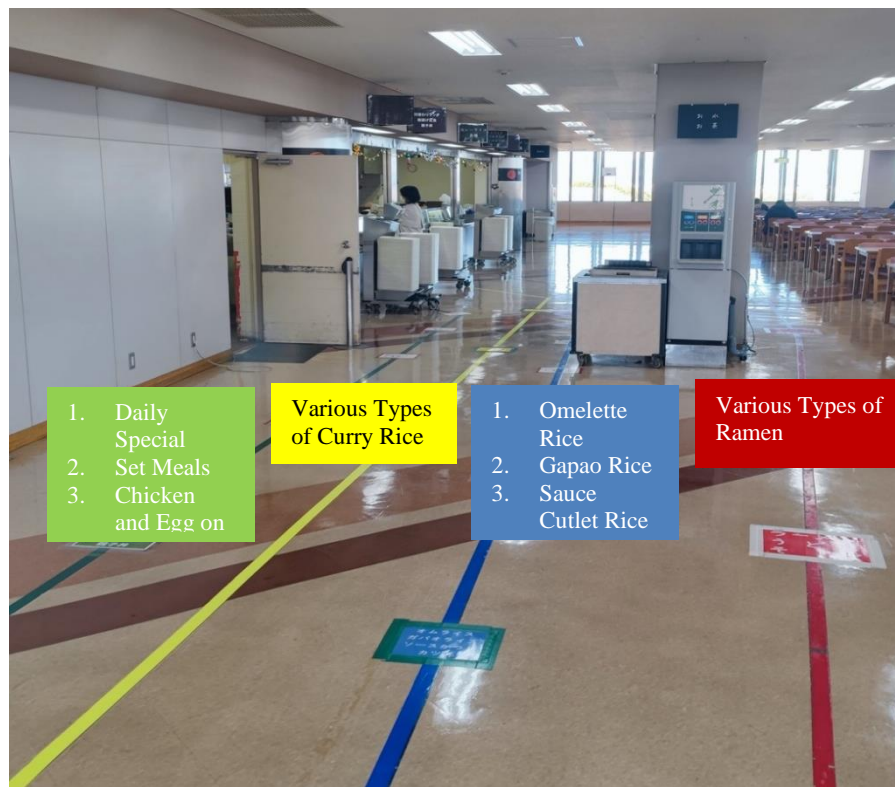
**Step 2:** Go up to the 4th floor (ROSE Kitchen A on the right side and ROSE Kitchen B on the left side).



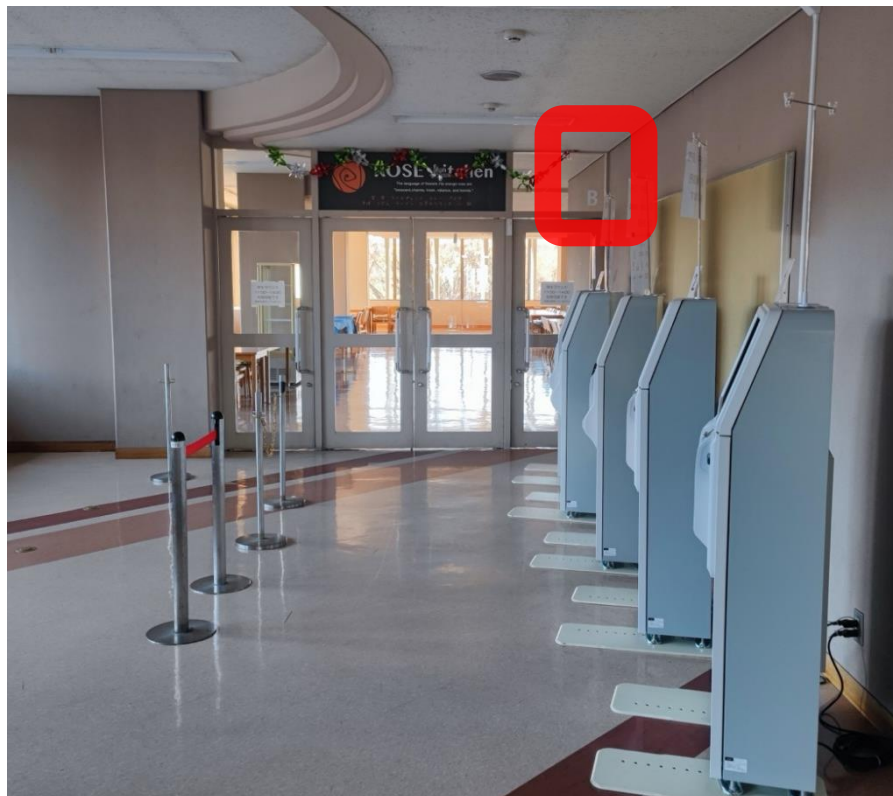
**Step 3:** Go to **ROSE Kitchen A**



**Step 4:** Follow the guide line to the lunch counter of your choice.



**Step 5:** Take your lunch to **ROSE Kitchen B** and eat there.





**Step 6:** After meal, take the dishes to the dish return slot in **ROSE Kitchen A**.

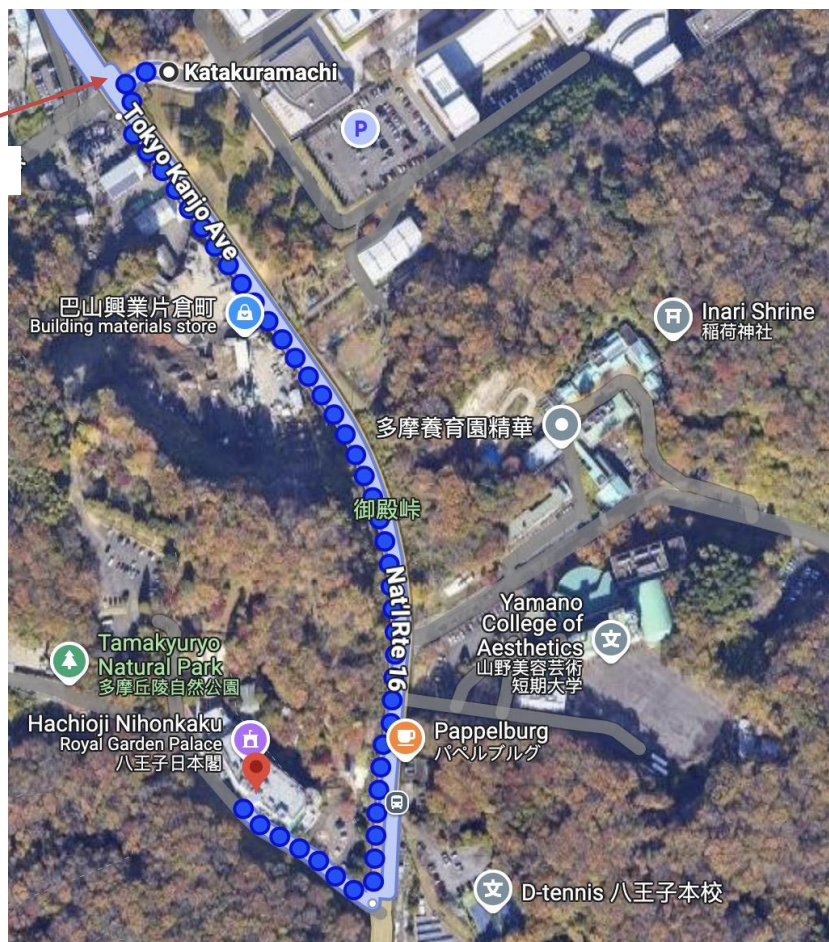


## Nihonkaku (Gala dinner)



From Tokyo University of Technology to Nihonkaku (about a 10-min walk)

West Gate of TUT



# Map

From KEIO Plaza Hotel Hachioji to Shimada Electric Manufacturing Company

