

lattel
:: {ROBOTICS}

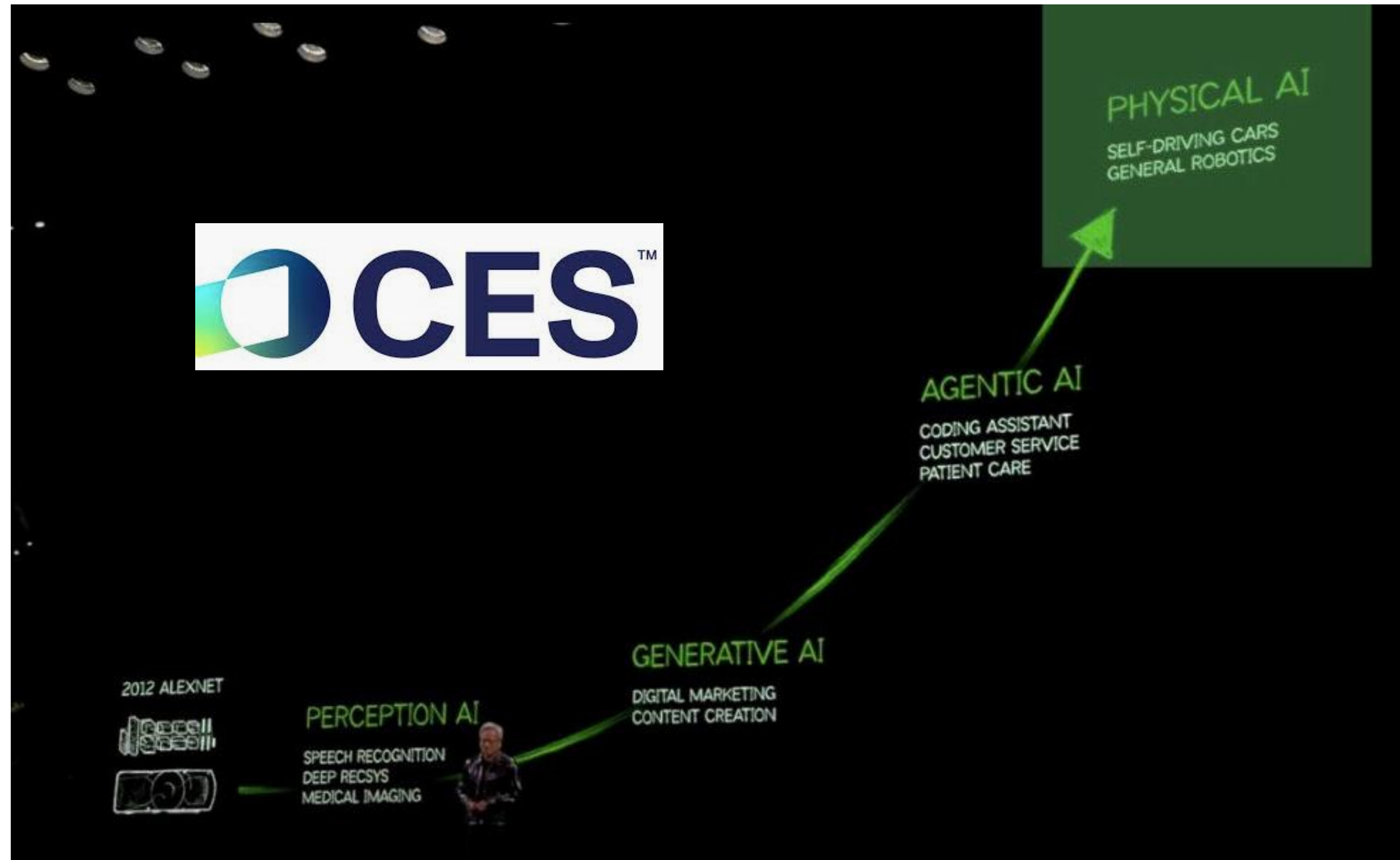
AI Applications Education

- *Learning AI applications practically* -

AUCKLAND UNIVERSITY OF TECHNOLOGY

14 MAY 2026

Jensen Huang (Nvidia) 2025: We Are Moving Towards Physical AI



“What is Physical AI?”

Physical AI enables autonomous machines like robots and self-driving cars to perceive, understand, and perform complex actions in the real (physical) world. It is also often referred to as “generative physical AI” due to its ability to generate insights and actions to execute on.”

<https://www.nvidia.com/en-us/glossary/generative-physical-ai/>

China Spring Festival Gala 2026: Humanoids are here



Current AI education is mostly computer science centric

AI Scientists

- strive to understand and acquire new knowledge and technique of AI



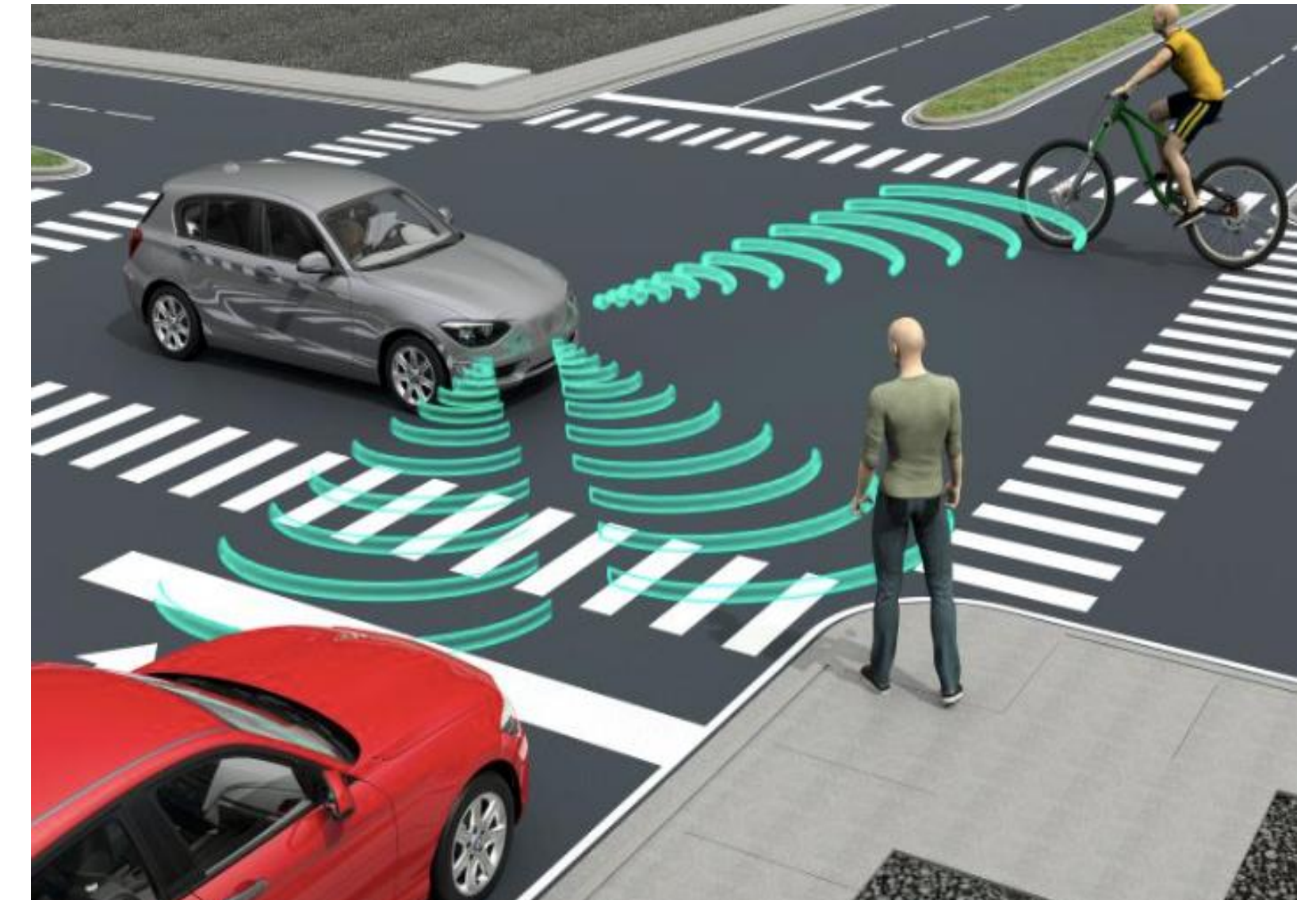
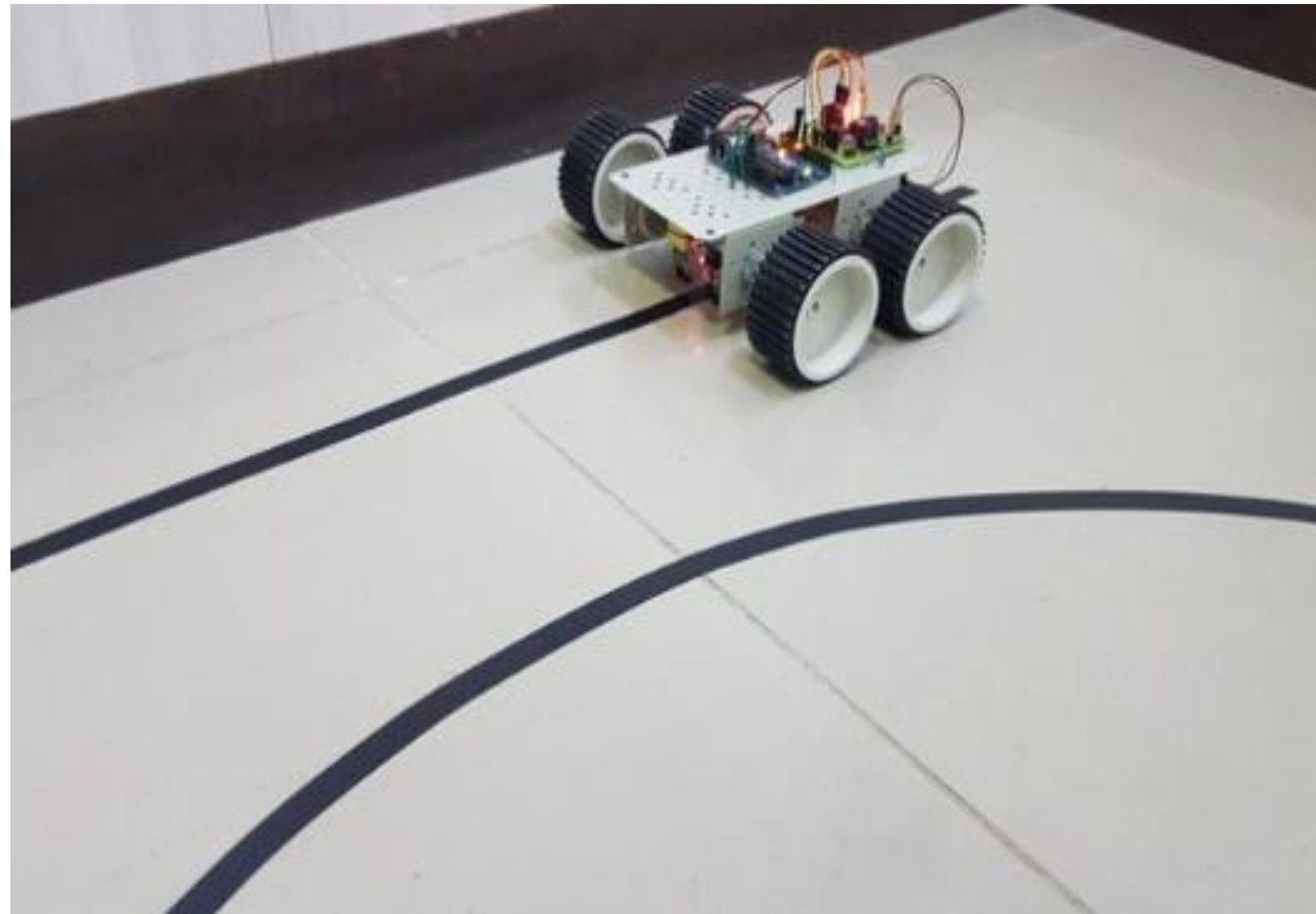
AI Engineers

- strive to develop usable devices, structures and processes of AI applications



The “Bridging Problem” in current robotics education

- The “**Bridging Problem**” – School-level Robotics Education vs. University-level Robotics Research

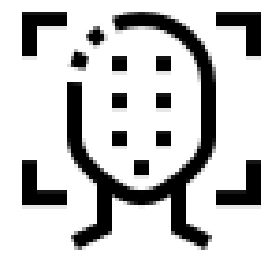


- Bottom-up Approach vs. Top-down Approach
- Conceptual Problems vs. Real World Problems

Lattel: Company Introduction

Lattel is a company providing artificial intelligence (AI) applications education & training solutions.

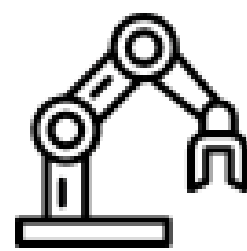
AI applications covered incl:



Computer Vision



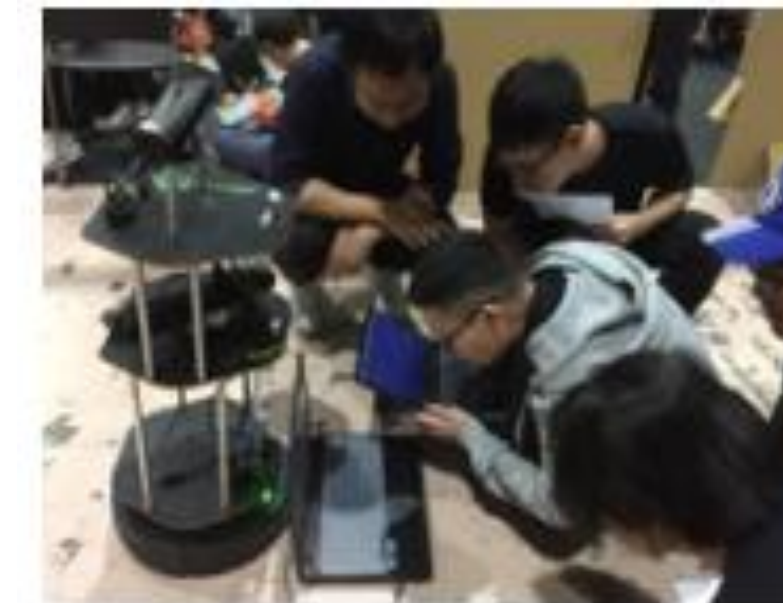
Autonomous Navigation



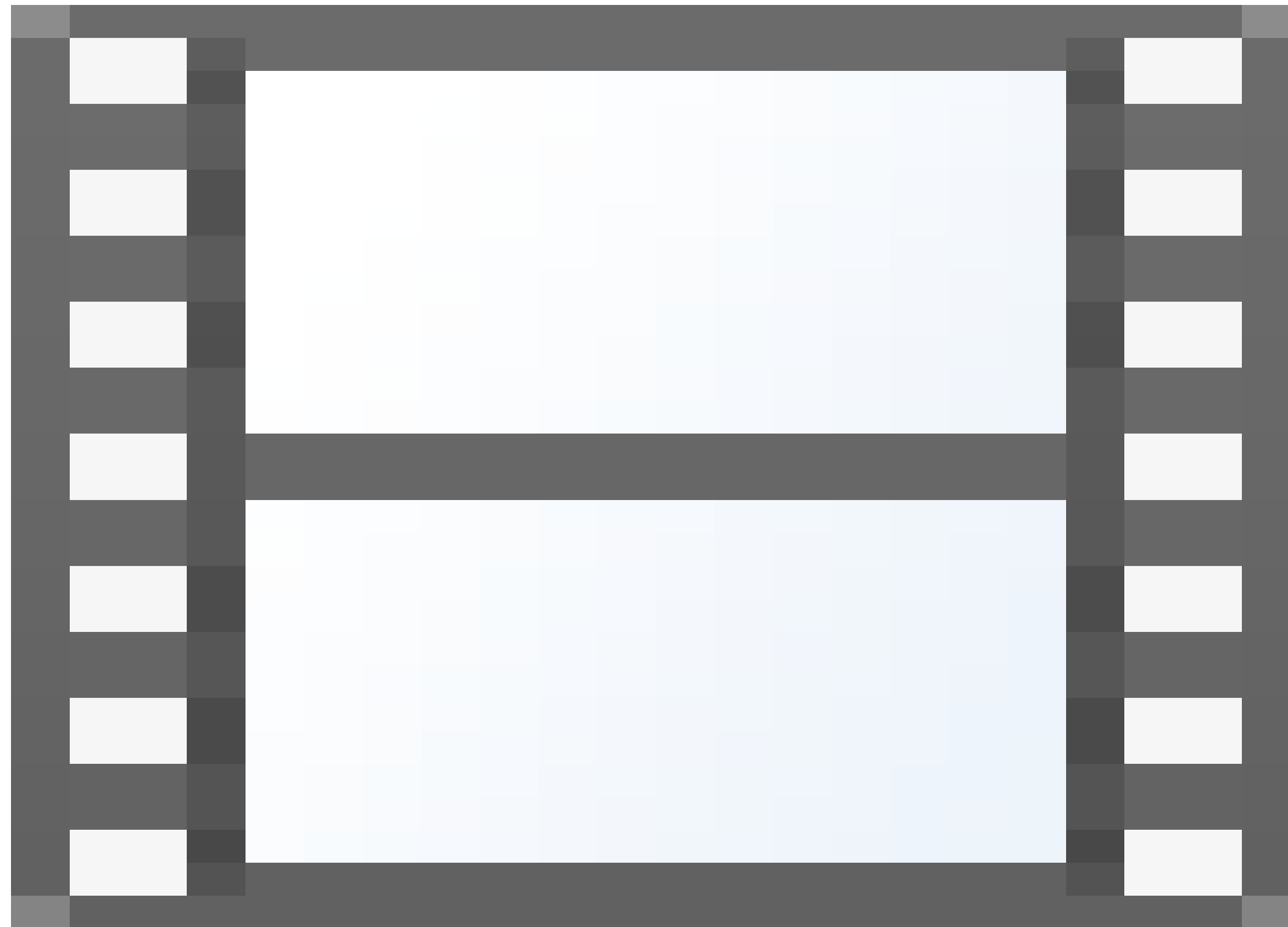
Object Manipulation



Speech Interaction



Jupiter2

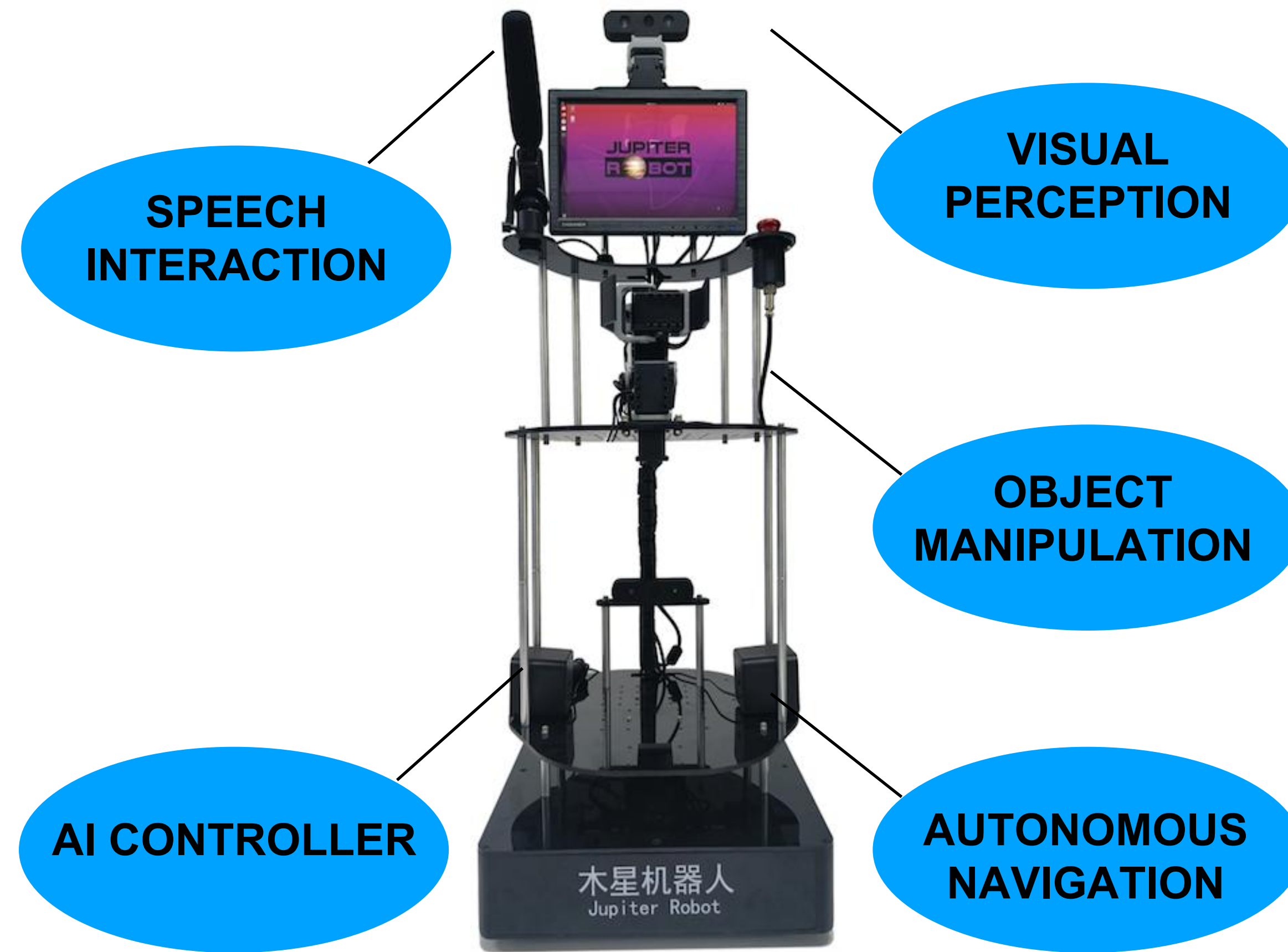


<https://youtu.be/hy1SjaC8ZSU>

Jupiter2: Integrated AI Applications Development Platform for Education

ROS-based in Linux (Ubuntu)

Open Platform



Robot **LEG**

- Autonomous Navigation

Robot **EYES**

- Visual Perception

Robot **ARM**

- Object Manipulation

Robot **MOUTH**

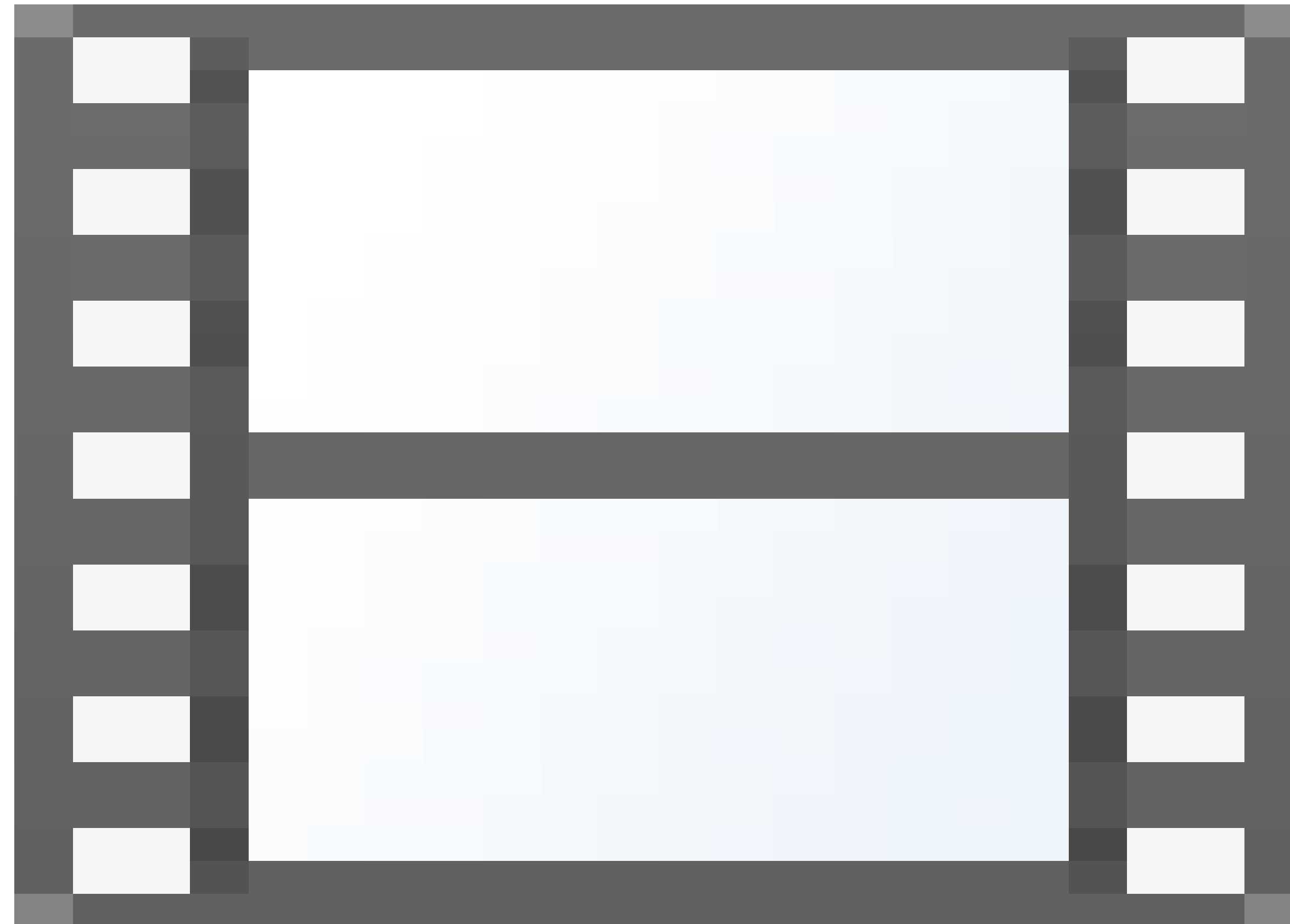
- Speech Recognition & Synthesis

Robot **INTELLIGENCE**

- Control, Machine Learning, Cloud Computing

Prerequisite: Programming Knowledge (Python)

Juno2



<https://youtu.be/ABF6H6F7SeY>

Juno2: A Personal AI Learning Device



Juno2 is a Personal AI Learning Box for individual technical development:

- Direct plug-and-play for standard robotic development environment (Ubuntu & ROS) without the need for software installation.
- Equipped with 3D visual perception and omnidirectional speech interaction system for technical development using own laptop / desktop.
- AI software modules (Python & C++) available include computer vision, speech interaction and navigation & robotic arm (simulator-based).

Jupiter AI Applications Learning System



Jupiter2

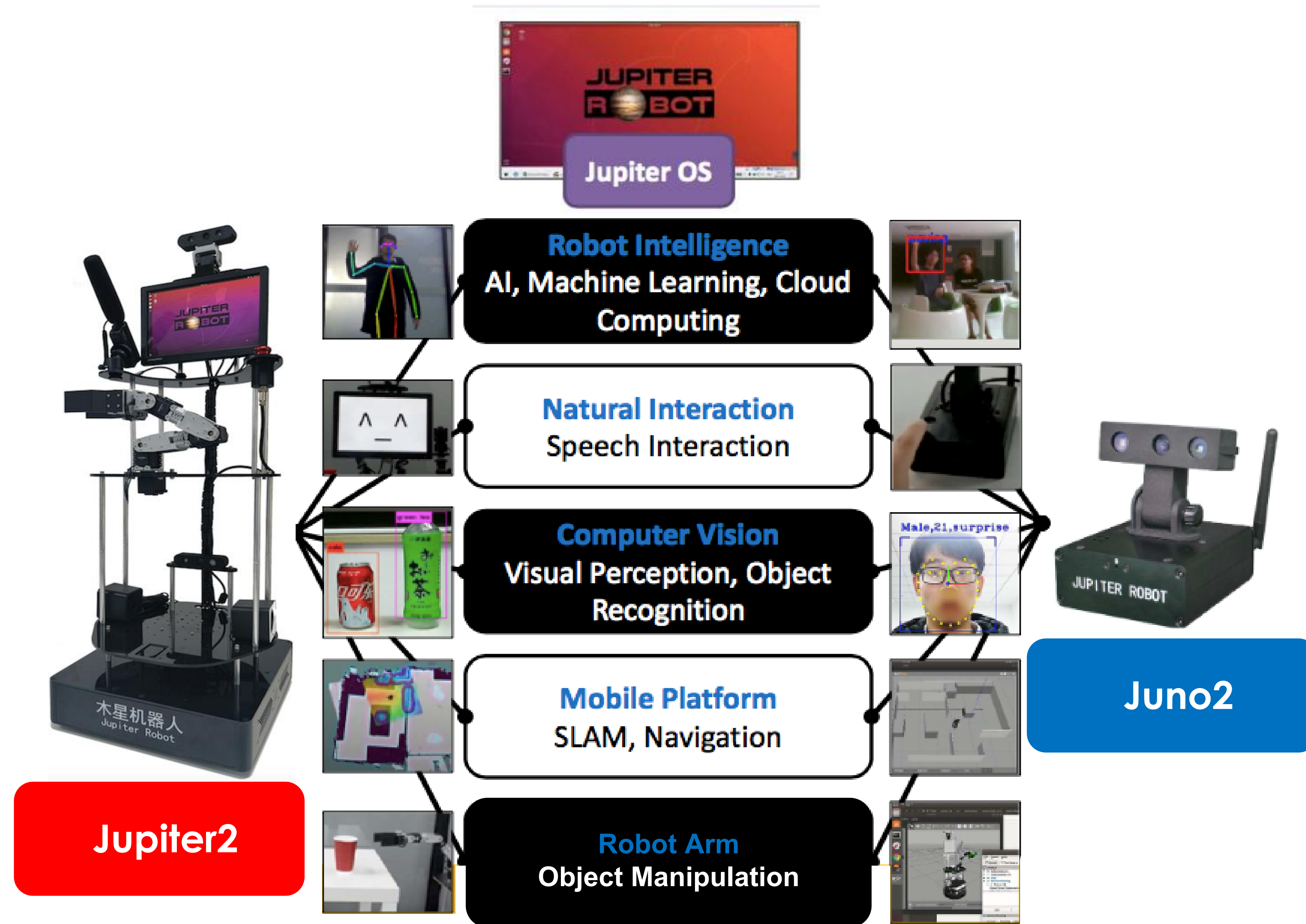


Juno2



Jupiter OS

Jupiter AI Applications Learning System



AI Applications Learning Contents (1/2)

ROS Basic

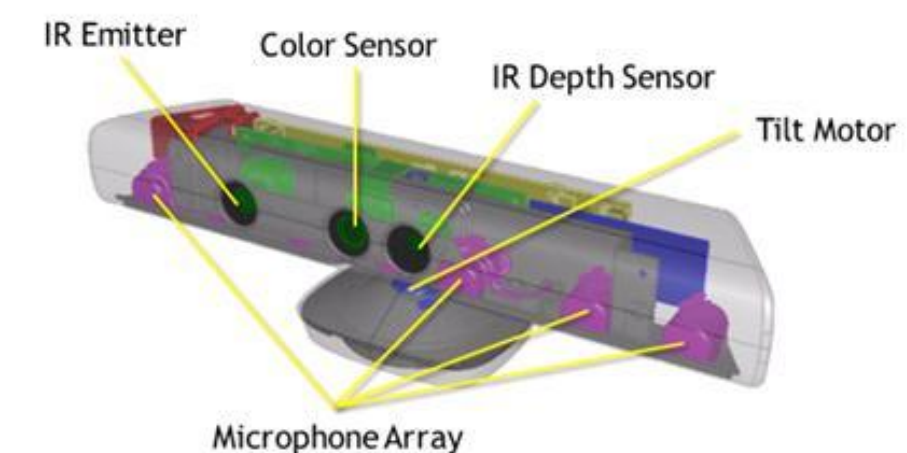
- Introduction
- Publisher
- Subscriber

Speech Interaction

- Speech Synthesis
 - Google TTS
- Speech Recognition
 - Google SR

Visual Perception

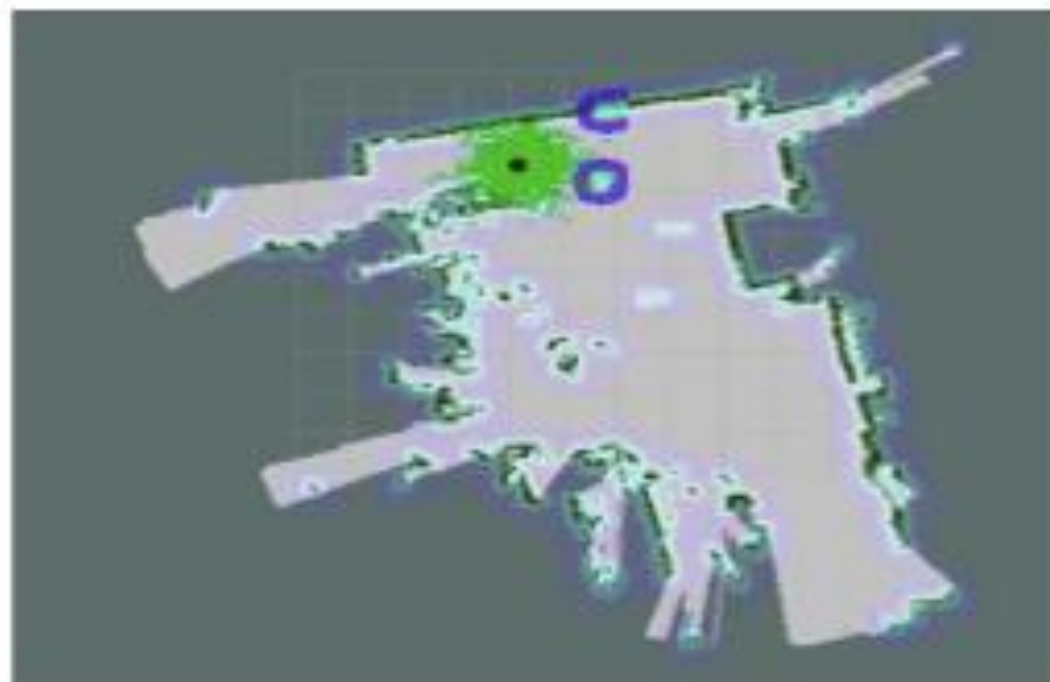
- Image Processing
 - Camshift Colour Tracking
 - Face Detection & Recognition
 - People Detection
- Depth Perception
 - Point Cloud



AI Applications Learning Contents (2/2)

Navigation

- SLAM Map Building
- Autonomous Navigation



Object Manipulation

- Joint Control
- Inverse Kinematics



AI Applications

- People Tracking
- Partybot



Software:

- **Ubuntu 20.04**
- **ROS Noetic / ROS2 Foxy**
- **TurtleBot Arm (MoveIt!)**
- **Robot Model in Gazebo**
- **OpenCV**
- **Yolo v5**
- **OpenPose**

AI Robotics & AI Applications Workshops



Section Electrical & Energy Efficiency

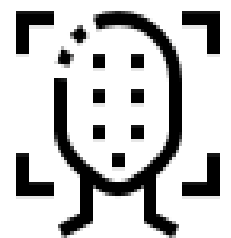



Nov 2024

School of Computing

June 2025



Training Workshop Offerings

MODULE		AI ROBOTICS INTRODUCTION WORKSHOP (3-DAY)	AI APPLICATIONS INTRODUCTION WORKSHOP (2-DAY)	ADVANCED WORKSHOP (2-DAY EACH)
	Computer Vision	✓	✓	✓
	Speech Interaction	✓	✓	✓
	Autonomous Navigation	✓		✓
	Object Manipulation	✓		✓

Juno2

Jupiter2

Customers: Over 30 schools & universities worldwide

- Jupiter Robot can be found in over 30 schools and universities worldwide.



CHINA & MACAU

清华大学
大连市第八中学
北京市第三十五中学
西安高新第一中学
华东师范大学第三附属中学
北京市十一学校
上海交通大学
承德医学院
嘉兴技师学校
嘉善中职学校
西安交通大学附属中学
南开大学
澳门坊众学校
澳门培正中学



AUSTRALIA

Charles Sturt University
St. George Christian School

Egypt

Arab Academy For Science, Technology & Maritime Transport

MALAYSIA

University Malaya
Universiti Sains Malaysia
German-Malaysian Institute

MEXICO

Southeast Veracruz Technical University

SINGAPORE

PSB Academy
Woodlands Ring Secondary School
Republic Polytechnic

SLOVAKIA

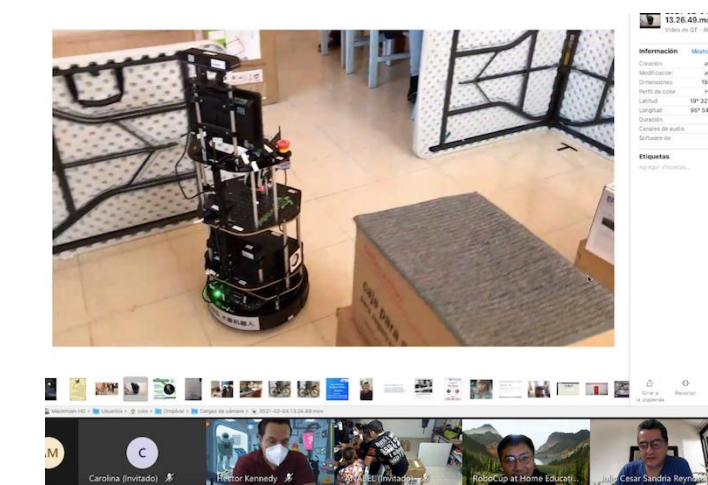
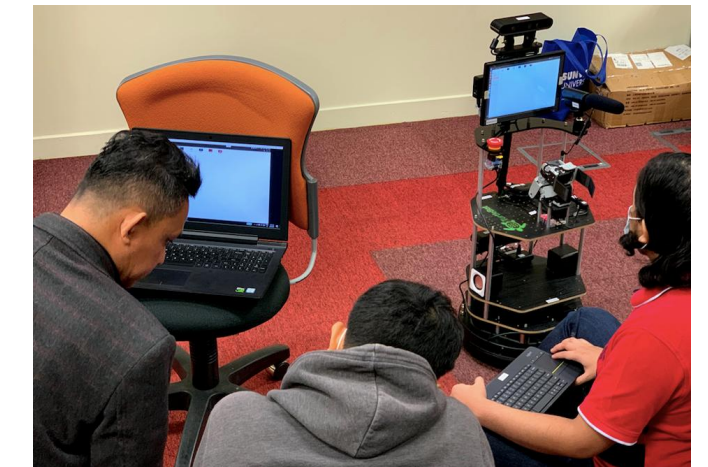
Comenius University

USA

Pace University

VIETNAM

Hue University (<https://youtu.be/kcGA-zFfSLM>)



<https://youtu.be/h9oSiCpc4Zw>

Education Collaboration: Universiti Malaya



DR. ZATI HAKIM BINTI AZIZUL HASAN
Senior Lecturer
Department of Artificial Intelligence
Faculty of Computer Science & IT



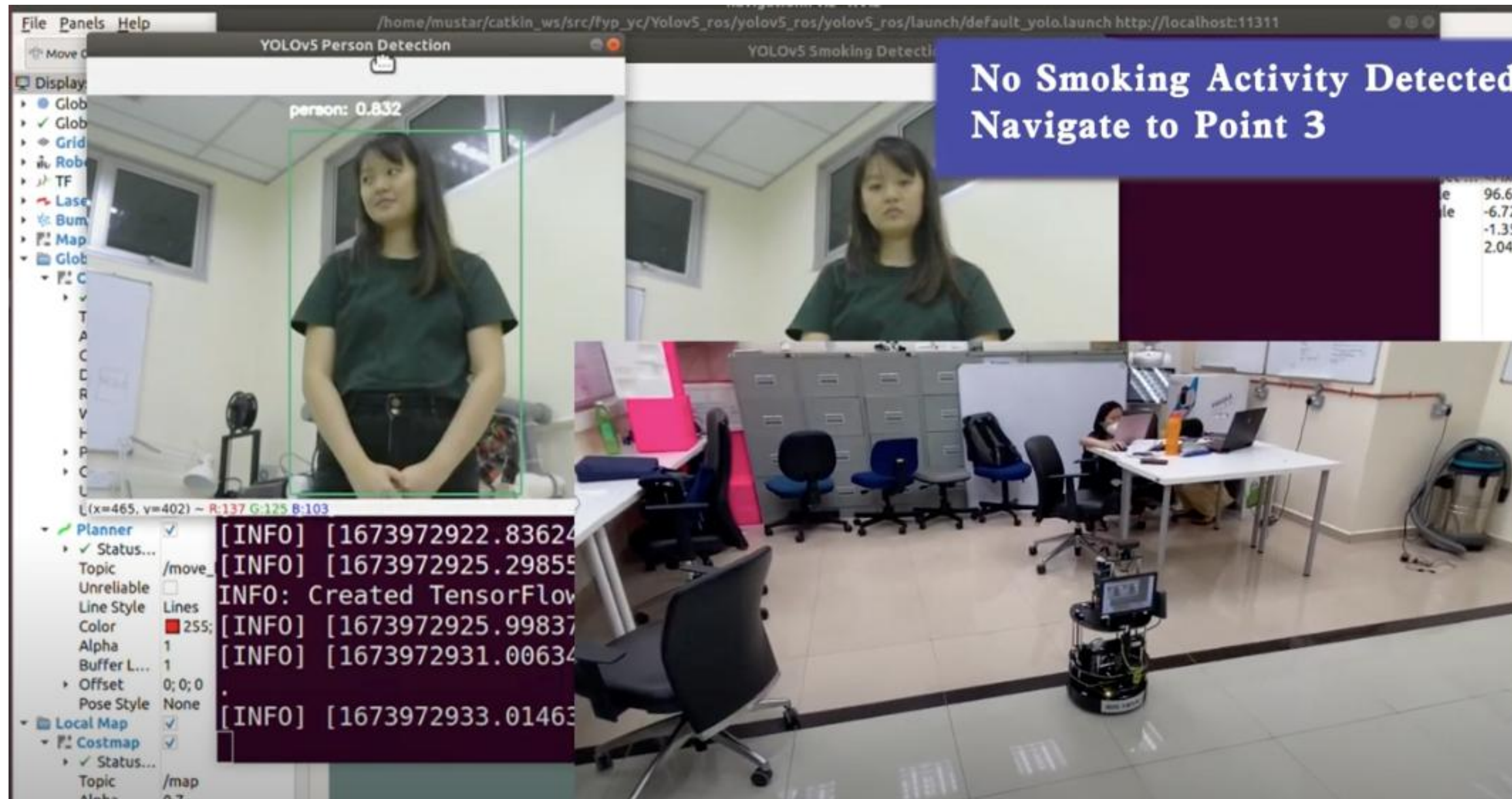
Undergraduate:

- 1) **Autonomous Robots** (4h)
Programme Name: Bachelor of Computer Science (AI)

Postgraduate:

- 1) **Robotics and Automation** (3h)
Programme Name: Master of Computer Science (Applied Computing)
- 2) **Autonomous Robotics** (3h)
Programme Name: Master of AI

Universiti Malaya won 2022 IEEE Malaysia Section Final Year Project



AI Robotics Collaboration: Charles Sturt University, NSW

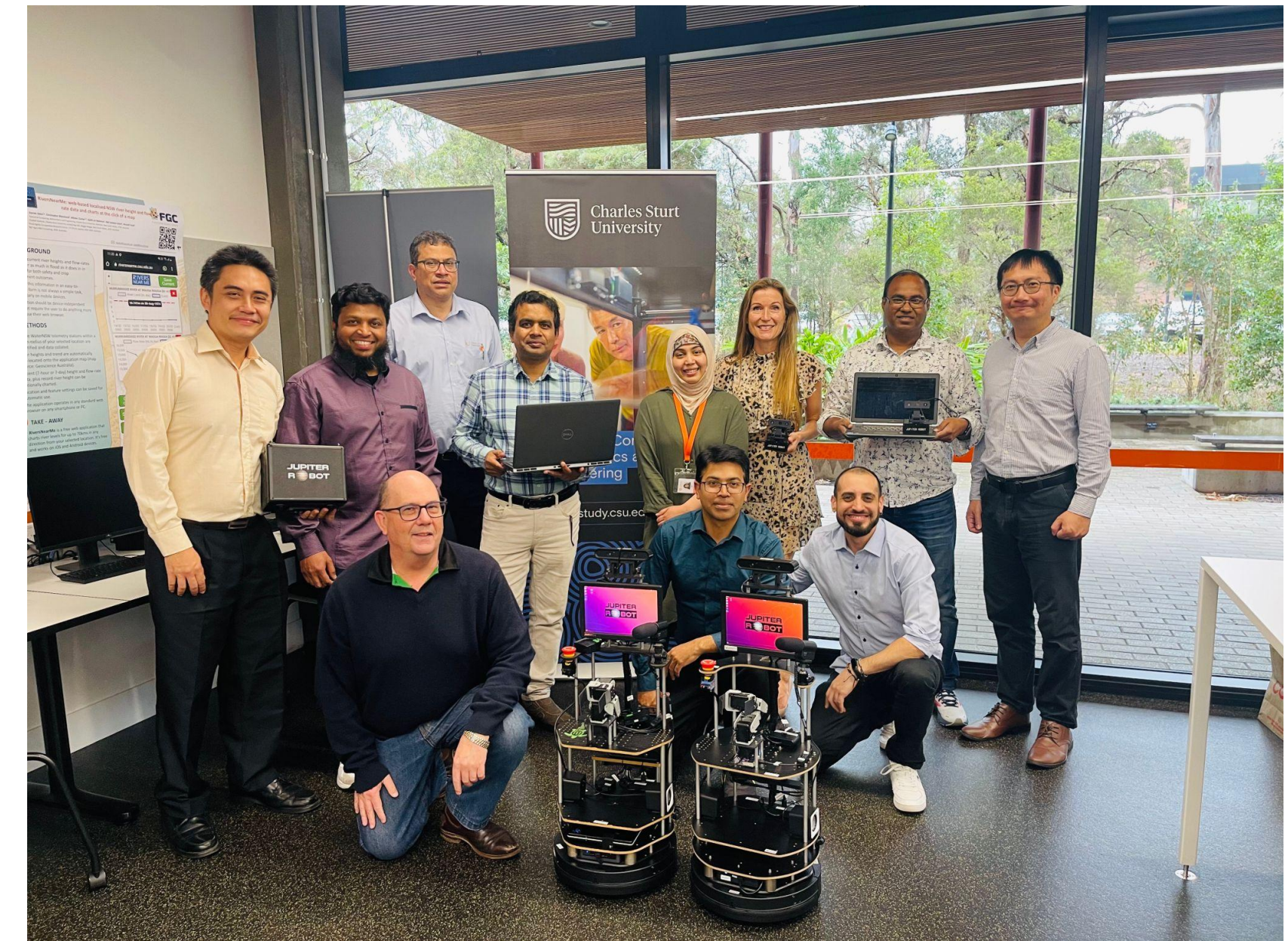


Charles Sturt
University



DR. SABIH REHMAN

Acting Associate Head of School
School of Computing, Mathematics
and Engineering



AI Robotics Collaboration: Murdoch University, Perth WA



MOHD FAIRUZ SHIRATUDDIN

Associate Professor of IT,
Associate Dean of International Engagement,
Academic Chair of BIT Games Software
Design & Production,

**AI Robotics Workshop
scheduled 23-25 June 2026**

AI Applications Collaboration: Charles Darwin University, NT



DR. CAT KUTAY
Senior Lecturer
Faculty of Science and Technology
Charles Darwin University



Research Collaboration: Tsinghua University Department of Computer Science & Technology (Prof. Liu Yong-Jin)



← → ↻ ieeexplore.ieee.org/document/9789512/authors#authors

To get future Google Chrome updates, you'll need macOS 10.15 or later. This computer is using macOS 10.13.

Deep Reinforcement Learning for Robot Collision Avoidance With Self-State-Attention and Sensor Fusion

Publisher: **IEEE**

[Cite This](#)

[PDF](#)

Yiheng Han ; Irvin Haozhe Zhan ; Wang Zhao ; Jia Pan ; Ziyang Zhang ; Yaoyuan Wang [All Authors](#)

33

Cites in
Papers

3006

Full
Text Views



Abstract

Document Sections

- I. Introduction
- II. Related Work
- III. Method
- IV. Experiments
- Conclusion

Abstract:

3D LiDAR sensors can provide 3D point clouds of the environment, and are widely used in automobile navigation; while 2D LiDAR sensors can only provide point cloud in a 2D sweeping plane, and then are only used for navigating robots of small height, e.g., floor mopping robots. In this letter, we propose a simple yet effective deep reinforcement learning (DRL) method with our self-state-attention unit and give a solution that can use low-cost devices (i.e., a 2D LiDAR sensor and a monocular camera) to navigate a tall mobile robot of one meter height. The overall pipeline is that we (1) infer the dense depth information of RGB images with the aid of the 2D LiDAR sensor data (i.e., point clouds in a plane with fixed height), (2) further filter the dense depth map into a 2D minimal depth data and fuse with 2D LiDAR data, and (3) make use of DRL module with our self-state-attention unit to a partially observable sequential decision making problem that can deal with partially

With audio

Robot Collision Avoidance with Deep Reinforcement Learning by Fusing A 2D LiDAR Sensor and A Monocular Camera

Yiheng Han¹, Irvin Haozhe Zhan¹,
Wang Zhao¹, Jia Pan², Ziyang Zhang³, Yaoyuan Wang³ and
Yong-Jin Liu¹

¹ Tsinghua University

² The University of Hong Kong

³ Huawei Technologies Co Ltd



lattel
:::{ROBOTICS}

International Communities: RoboCup@Home Education Challenge

- RoboCup 2022 Bangkok

WORKSHOP (6 – 10 July 2022)

- Kasetsart
- Chulalongkorn
- KMUTNB
- KMUTT
- PSU



CHALLENGE (11 – 17 July 2022)



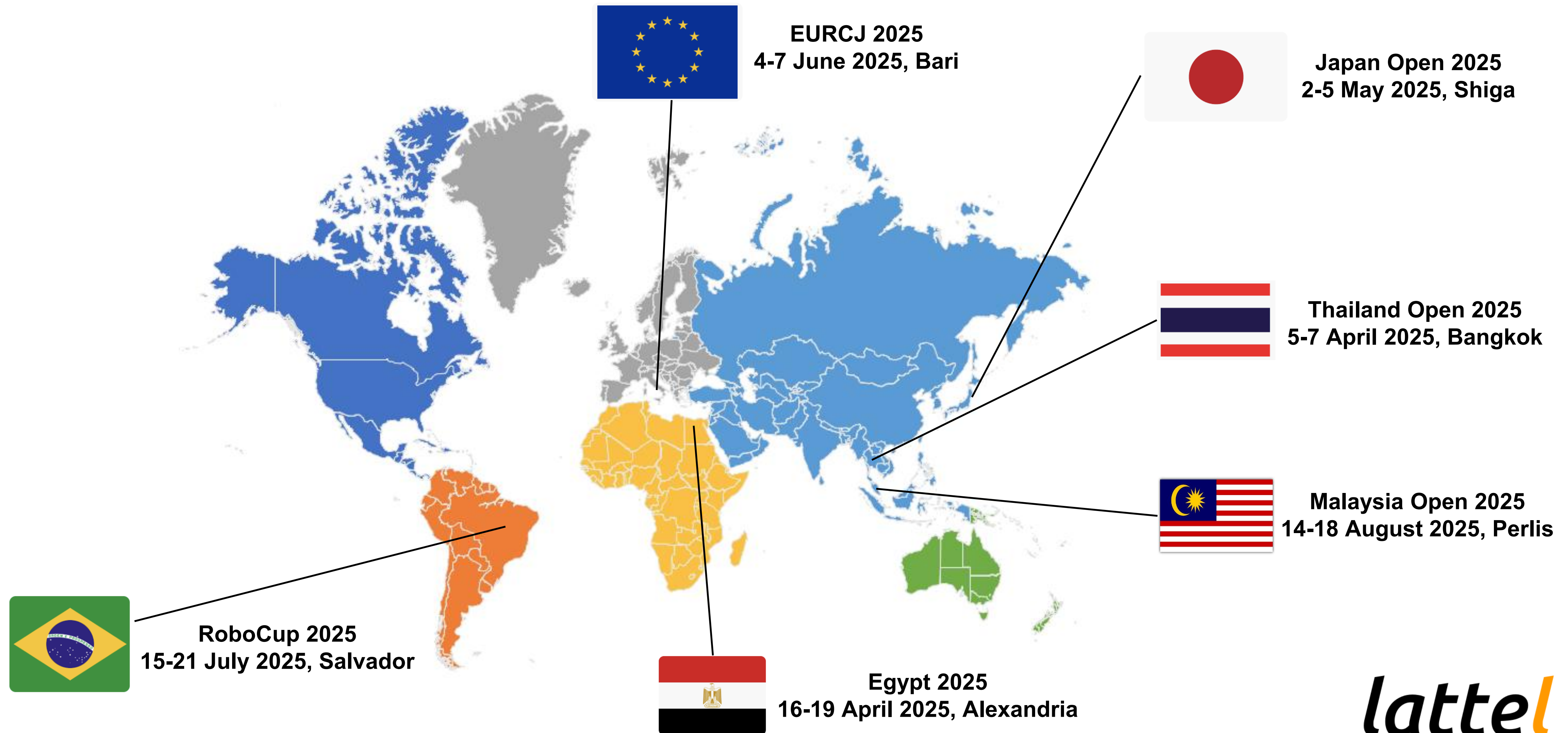
RoboCup 2022

RoboCup@Home
EDUCATION



https://youtu.be/IHJrP4S_GoA

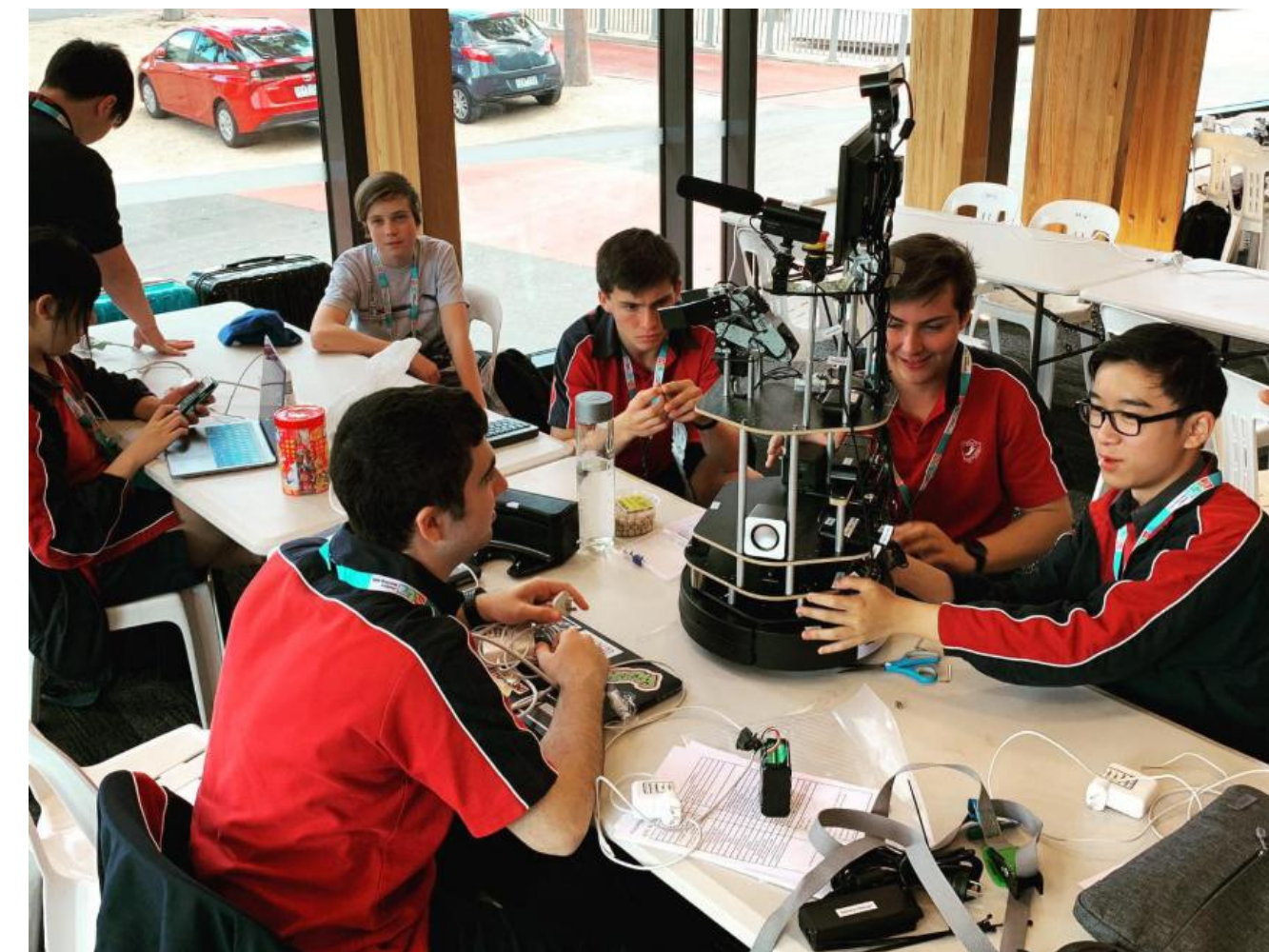
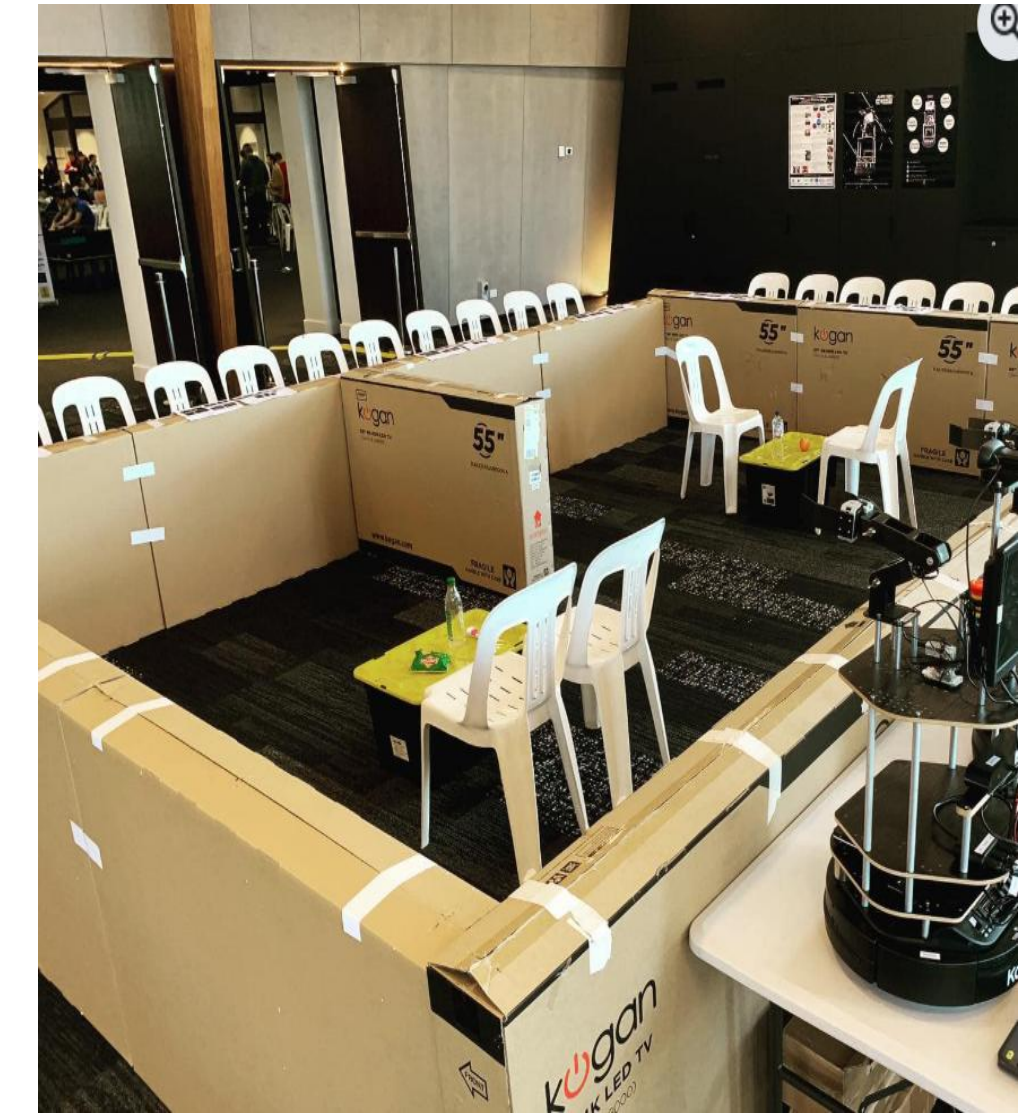
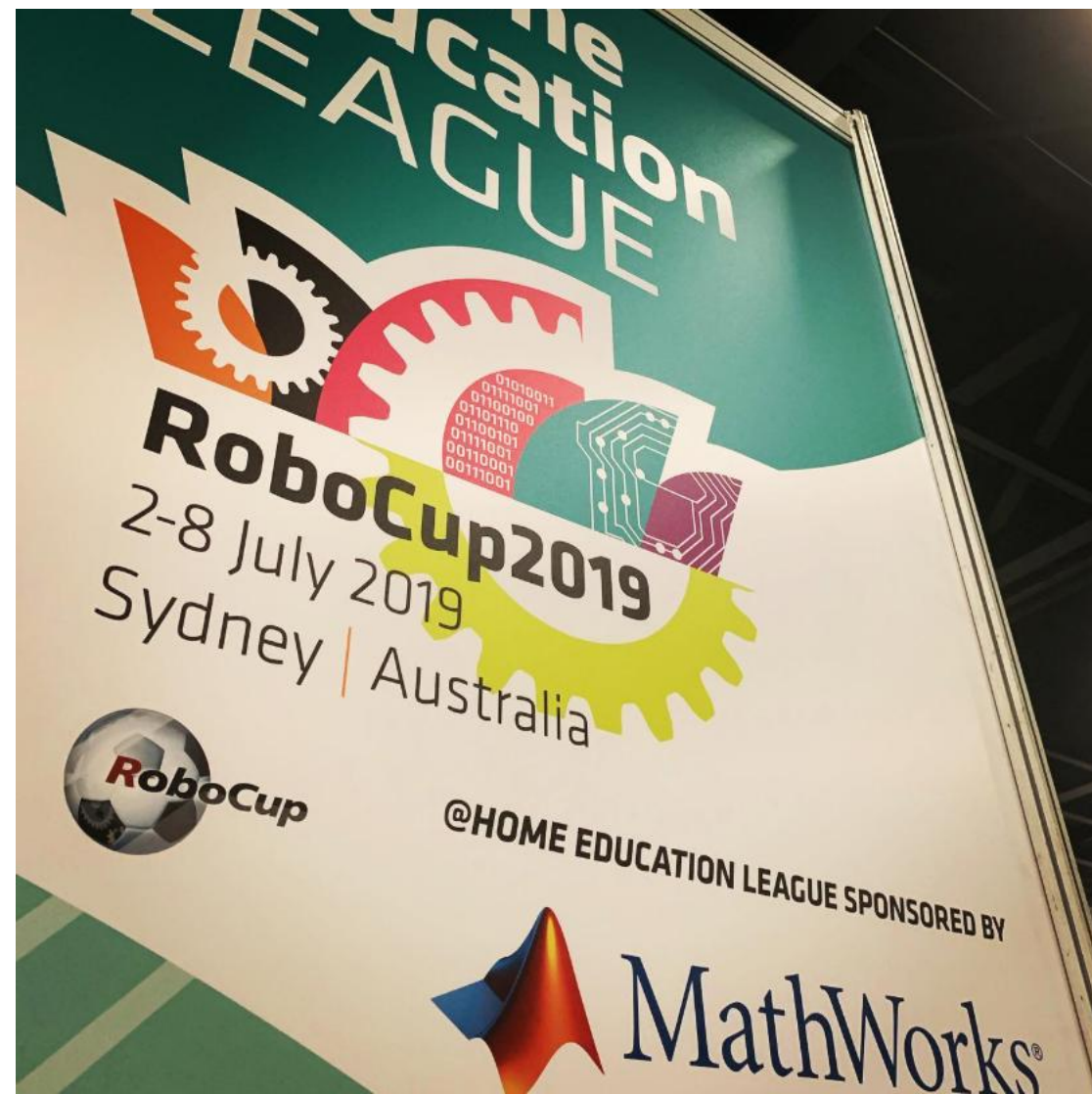
RoboCup@Home Education Challenges (2025)





RoboCup 2019 Sydney

RCJ Australian Open 2019 Melbourne



Collaboration Opportunities with Auckland University of Technology



Training

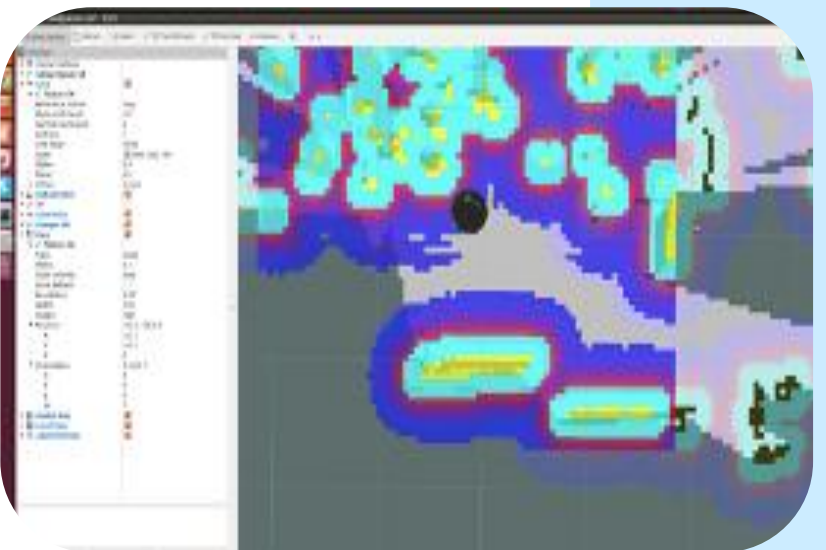
- AI training for professionals, general public

Education

- AI education for students of all levels



Collaboration Opportunities



Research / FYP

- Deployment of Jupiter Robot as research platform
- Robotic prototype development

Competition

- RoboCup@Home Challenges & other AI robotics competitions



www.lattelrobotics.com

Contact: jerry.tan@lattelrobotics.com