



工業技術研究院

Industrial Technology
Research Institute



Intelligent MMSL
Enabling an Innovative Future
I24S ITRI GO

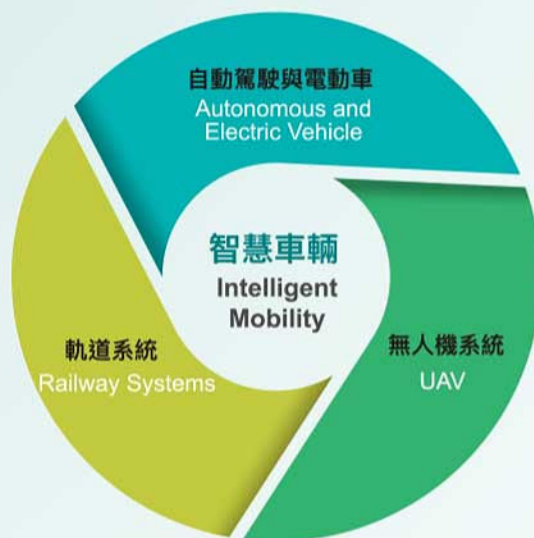
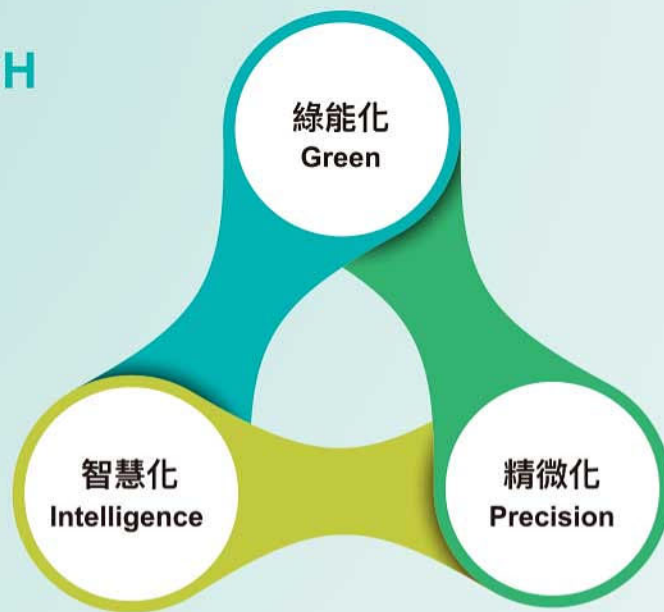
2025年報/簡介

2025 ANNUAL REPORT / MMSL OVERVIEW

機械與機電系統研究所

MECHANICAL AND MECHATRONICS SYSTEMS
RESEARCH LABORATORIES, MMSL





2024 HISTORY

02.05

Vehicle Energy Replenishment Alliance: Facilitating Three Main EV Charging Topics

Driving consensus on battery swapping industry standards, charging station metrology, and smart charging specifications to strengthen Taiwan's charging industry.

03.29

"Acoustic-based Non-Destructive AI Inspection Technology" Surpasses Global Leader the Modal Shop in Accuracy

Already implemented at Auroral Sinter Metals, Taiwan's largest powder metallurgy company, for inspecting EV brake components. The accuracy rate improved from 85.12% to 98.44%.

04.23

High-Definition Map for Autonomous Vehicles: Fast and Accurate Setup

Feasibly import government traffic data, achieving absolute accuracy within 30 cm; automatically detects roadway changes as environments evolve and complies with Ministry of the Interior regulations.

08.21

Collaboration with EU Horizon Europe to Develop a "High-Fidelity Human-Like Dual-Arm Collaborative Robot"

Deployed at Infa Industrial, an "hidden champion" in Taiwan's hand tool sector, reducing fixture costs by 50% and propelling Taiwan's hand tool industry to global leadership.

06.26

Development of "Low-Carbon Plasma Technology" to Support the PCB Industry's Green Transition

By integrating energy-saving equipment and optimizing production processes, this technology can reduce greenhouse gas emissions to one-tenth, boosting the international competitiveness of Taiwan's PCB industry.

04.30

"Intelligent Driving School Proctor Robot": An Unmanned Licensing System for an Aging Society

Adopted by Toyota Driving Schools in Japan, addressing examiner shortages, improving license renewal efficiency for an aging population, and enhancing road safety.

09.04

The "AI Intelligent Wafer Grinding System" with Built-In Ultrasonic Debris Removal is Five Times Faster

Enhances silicon carbide (SiC) processing efficiency by three to five times while reducing consumable costs. Verified with domestic equipment, spindle, and SiC Crystal Growth partners including Speedfam, Theta Precision, and Winsheng Material Technology.

09.11

Award-Winning! The "AI-driven Self-Navigating Miniature Serpentine Robotic System for Natural Orifice Transluminal Endoscopic Surgery" Won a 2024 R&D 100 Awards.

This system combines robotic arms, AI-based autonomous navigation, and miniature force sensors—functioning like "Google Maps" for the human body. It provides precise surgical path planning and significantly reduces surgical risk.

11.26

Promoting Electric Logistics Vehicles: Industry Collaboration Showcases Green Transportation Success

By partnering with the electric logistics vehicle industry, such as China Motor, ADATA, HCT Logistics, and others, we aim to demonstrate diverse applications and accelerate EV adoption in logistics, contributing to Taiwan's 2050 net-zero emissions goal.



STARTUPS

2015 創星淨聯科技 Purus tek. Co., Ltd.

PM2.5可攜式空氣清淨機
Portable Air Purifier

2016 福寶科技 FREE BIONICS TAIWAN INC.

外骨骼行動輔助機器人
Wearable Walking Assistive
Exoskeleton Robot

2016
R&D 100 Awards

2017 黑木 KUROKI INDUSTRIAL Co., Ltd

全加成印刷電子產品
Additive Process for Printing Circuit

2017 起而行綠能 eTreego Co., Ltd

互動式充電管理系統
Interactive Charging Management
System and Method Thereof

2018 漢朋科技 HEN PENG TECHNOLOGY Co., Ltd.

流體機械能源服務
The Construction Technology of
Fan Energy Test System

2018 原見精機 Touché Solutions

安全觸覺機器人
Higher Sensitivity Tactile-film
System for Wearable Orthosis

2015
R&D 100 Awards

2019 盟英科技 Main Drive Co., Ltd.

諧波減速機
Harmonic Reducer

2021 智連工控 Adirtek Co., Ltd.

SECS/GEM 通訊協定/介面
SECS/GEM Solution

2022 科飛數位 KopherBit Co., Ltd.

整車控制平台
Drive-by-Wire Vehicle Platform

2025 赫倫 Holon Robotics Corporation

機器人核心軟體
Operating Software of Robot Worcell

2024 HONOR

07.05

**The High-Density Composite
Material Probe Card**

Honored with the "2024 Outstanding
Research Award" (Gold Medal)

07.05

**AI-driven Self-Navigating Miniature
Serpentine Robotic System for
Natural Orifice Transluminal Endo-
scopic Surgery, AiSNMSR**

Honored with the "2024 Outstanding
Research Award" (Silver Medal)

07.05

**The RobotSmith Digital Grinding
and Polishing Robotic System**

Honored with the "Industrial Contribu-
tion Award" (Silver Medal)

09.11

**AI-driven Self-Navigating Miniature
Serpentine Robotic System for
Natural Orifice Transluminal Endo-
scopic Surgery, AiSNMSR**

Honored with a 2024 R&D 100
Awards

INTERNATIONAL AWARDS



LOCATION



- **58 Bldg.** 自動駕駛與電動車
- **22 Bldg.** 先進與綠能製程設備 / 智慧機器人
- **53 Bldg.** 軌道系統
- **11 Bldg.** 智慧工廠 / 運動控制核心系統 / 無人機系統

Add : 310401新竹縣竹東鎮中興路四段195號

195, Sec. 4, Chung Hsing Rd., Chutung, Hsinchu 310401, Taiwan

Tel : +886-3-5912727 王毓琪經理 (Sherry Wang, Manager)

Email : sherry_wang@itri.org.tw