



工業技術研究院
Industrial Technology
Research Institute

I24S 智慧機電 創未來 一起發★

Intelligent
System Smart Sustainable Society

Intelligent MMSL
Enabling an Innovative Future
I24S ITRI GO

2024 年報 / 簡介

2024 ANNUAL REPORT / MMSL OVERVIEW

機械與機電系統研究所

MECHANICAL AND MECHATRONICS SYSTEMS
RESEARCH LABORATORIES, MMSL.



The Director's Words

Greetings to all distinguished leaders of industry and academia!

Welcome everyone to open this technical booklet, "2024: A Dragon's Leap into Promising Futures", to get to reveal the achievements of the MMSL, ITRI. As the general director of MMSL, I sincerely invite you to explore the fruitful demonstration of the past year and also kindly seek your encouragement and guidance!

MMSL has adopted a new slogan this year:

“Intelligent MMSL Enabling an Innovative Future I24S ITRI GO”

“I2” represents the two major areas of machinery: “Intelligent Manufacturing” and “Intelligent Mobility”, and the “4S” echoes the technology strategy blueprint of ITRI in 2035.

- **System integration:** The term “machinery” now encompasses not only individual machine equipment, but also system integration, including concepts like smart factories with equipment integration for production lines.
- **Sustainable environment:** In recent decades, there has been a global wave of net-zero carbon reduction, where alongside our pursuit of technological advancements, we are also actively seeking harmony and coexistence with nature. The use of materials needs to align with the development of green technology.
- **Smart living:** With the increasing maturity of smart technology, AI, and robotics, it is essential to integrate technology into our daily lives, leveraging its capabilities to meet our needs more quickly, conveniently, and intelligently.
- **resilient Society:** We are committed to developing nationally-owned resilient technologies to address risks such as natural disasters and environmental impacts. The goal of our research and development is to assist the country in turning crises into opportunities.

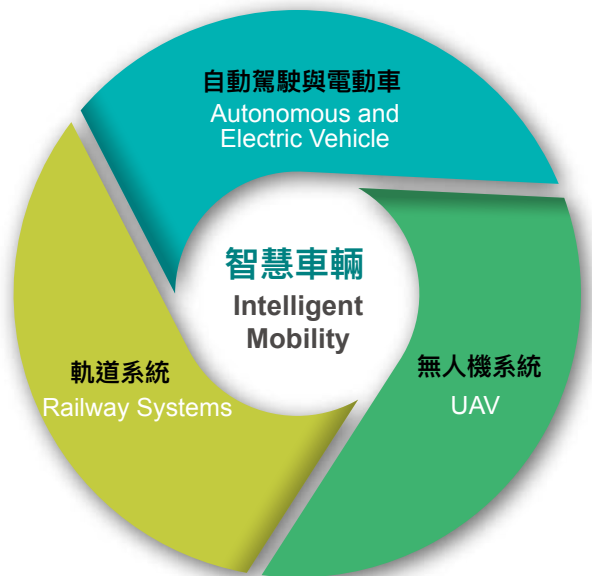
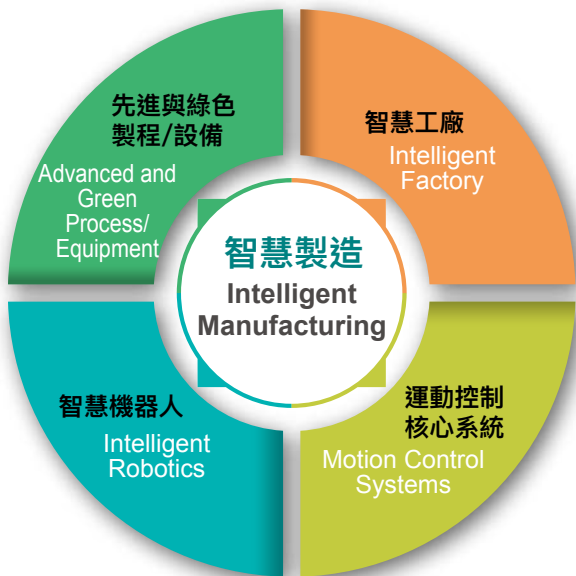
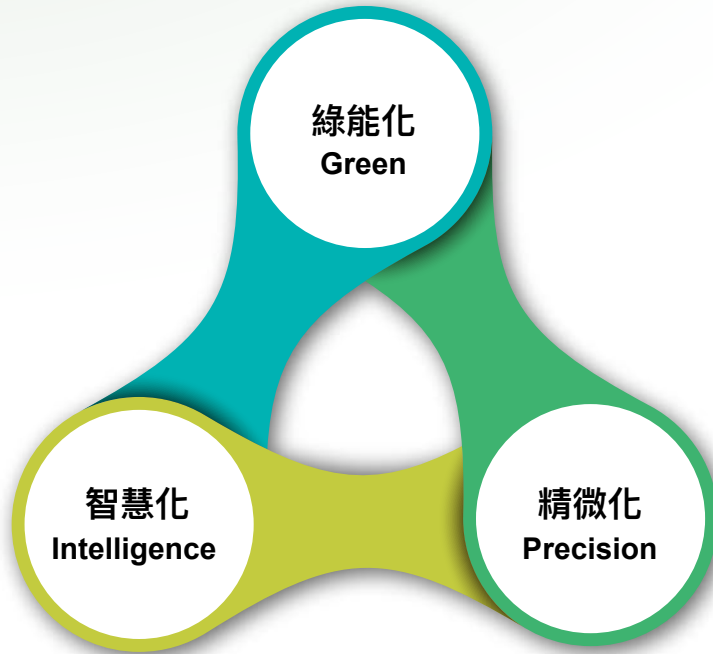
Internally, we set the core philosophy outlined above as our research foundation; externally, we maintain ongoing collaboration and interaction with government, industry, and academia. By staying attuned to the trends of the times and embracing an innovative spirit, we aim to forge new horizons in the industry hand in hand with all research sectors.

Semiconductors, AI machinery, smart vehicles, and sustainable zero-carbon initiatives are currently hot research topics. Over the past year, we have achieved remarkable results in these fields. For instance, our Institute's 2018 startup company, "Green Energy Mobility," collaborated with leading domestic enterprises such as Shihlin Electric, Hotai Motors, and Heraeus Corporation to establish a new subsidiary, "Gochabar," becoming the Institute's first exemplary company to succeed in creating a new startup. In the field of smart vehicles, we partnered with Taoyuan Airport in 2023 to introduce our self-driving technology for employee shuttle operations, making Taoyuan Airport one of the world's only airports with autonomous shuttle services. In the booming semiconductor industry, we launched the "Head-Matrix-ALD" to meet the demand for precision coating, integrating multiple front-end coating processes into one to reduce chip pollution caused by repeated conversions. These globally pioneering technologies have received international recognition and were honored with the 2023 R&D 100 Award in the United States, further demonstrating the leading position of MMSL in Taiwan's semiconductor industry.

MMSL aspires to lead the forefront of the machinery industry. We hope this booklet serves as a valuable resource for you to promptly find solutions when facing research and development challenges. We look forward to more collaboration opportunities in the future and to advancing together with you side by side!

General Director, MMSL, ITRI





International Awards



aePLASMA

2012



Head-Matrix-ALD

2023



FluxMerge™ Motor

2013



Software-defined Augmented Robot Joint (SARJ)

2021



Dual Arm Robot System (DARS)

2015



Tactile-film System for Wearable Orthosis



Exoskeleton Robot

2016



CyberEpi

2017



UAV

2019



UAV

2020



CINmat Microwave Annealing Technology

Spin off from MMSL

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

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



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