

2025 Oct. 16 (Thu) - AI & Robotics Strategic Innovation



Prof. **Ming-Der Shieh**

PM 03:20 - 03:50

大南方新矽谷推動方案

The Southern Taiwan Silicon Valley Program
–An Overview

Director, STSV Program Office



The Southern Taiwan Silicon Valley Program – An Overview



「大南方新矽谷」推動辦公室
Southern Taiwan Silicon Valley Program Office (STSVPO)

Prof. Ming-Der Shieh

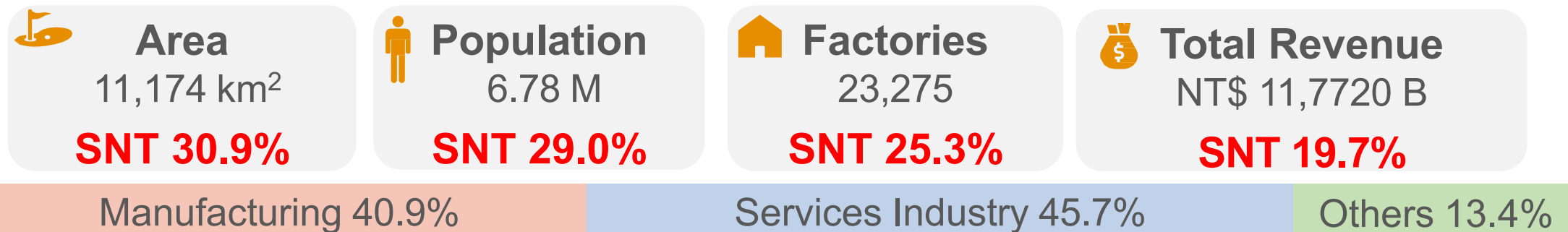
2025/10/16

Outline

- **Introduction to Southern Taiwan's Industrial Landscape**
- **Program Description**
 - ✓ General Overview
 - ✓ DC Micro-Grid Demonstration
 - ✓ Smart Rainforest Industry Innovation Subsidy Program
- **Taiwan Smart System Integration Manufacturing Platform**
- **Case Studies**
- **Conclusion**

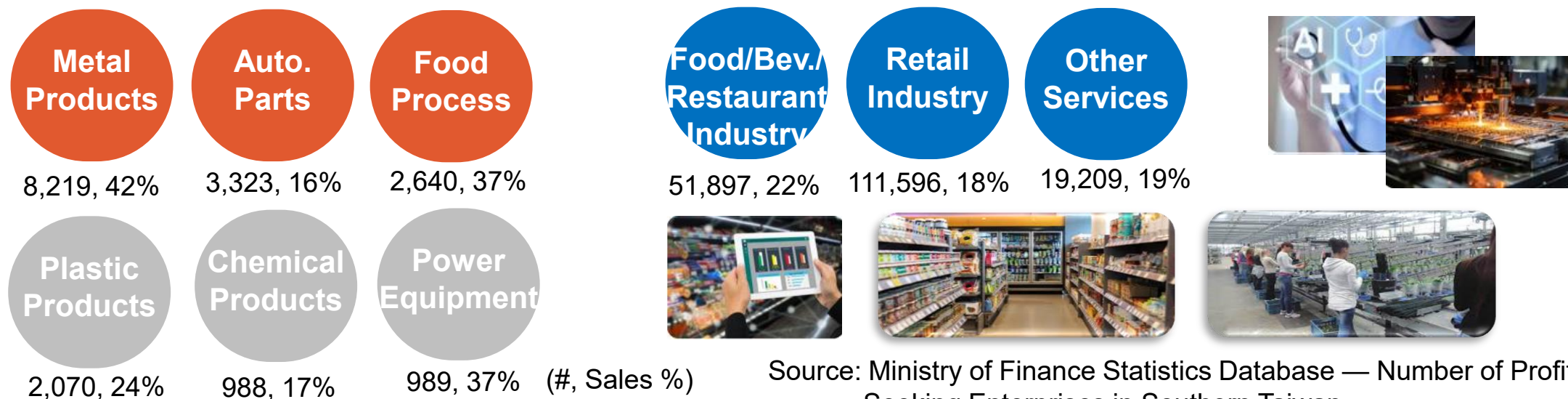
The State of Industries in Southern Taiwan

- Place equal emphasis on manufacturing and services
- Revenues in the Southern Taiwan Science Park **rank #1** (Jan. ~ Apr. 2025), with a growth rate of **39.55%** in 2024.



SNT: Share of the National Total

Source: ISTI/ITRI, 2024/12



Source: Ministry of Finance Statistics Database — Number of Profit-Seeking Enterprises in Southern Taiwan

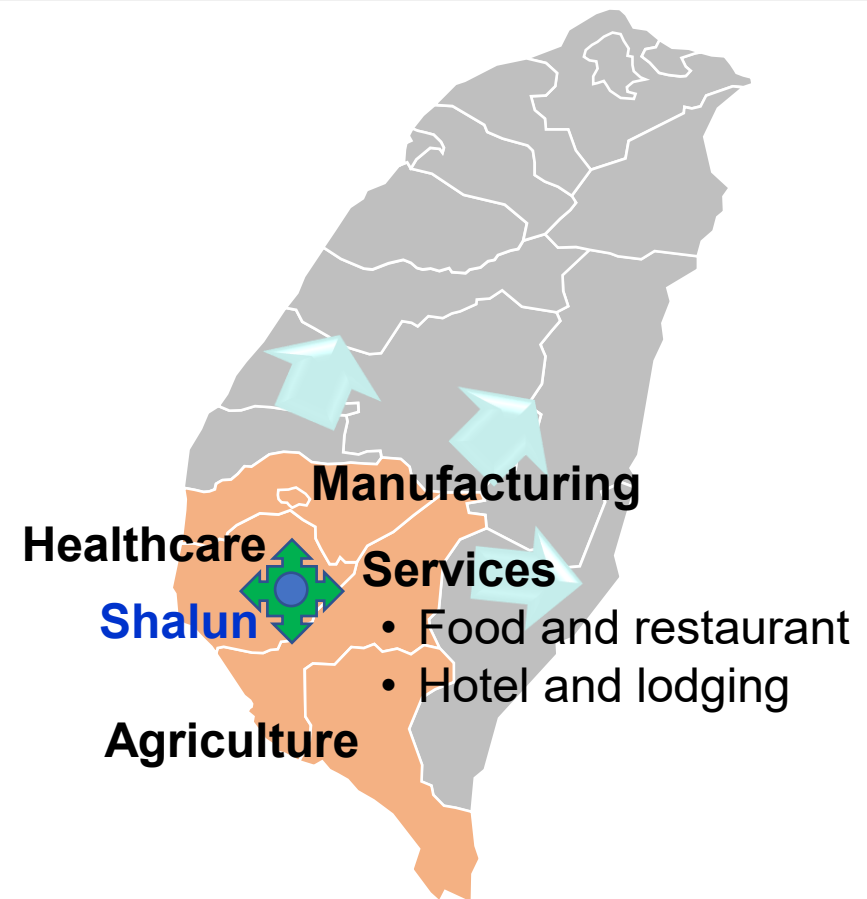
Program Overview

- **Goal:** Empowering the national “**AI island**” vision through the establishment of a new **Silicon Valley in southern Taiwan**, launching from the **Shalun region**.

- **Execution Plan:**

- ✓ Augment computing capacity
- ✓ Cultivate AI talents
- ✓ Bridge the ecosystems
- ✓ Expand AI applications across industries

⇒ **Domain-specific requirements & intelligent (AI) system integration**



Content

Toward Demand-Driven Industry Implementations

Shalun AI Industry Zone, Carbon-Free Power Operation Demo.

Smart Health Industry Innovation Park

- Smart Healthcare Key Technology R&D
- Smart Healthcare Industry-Academia Alliance

Net Zero Green Energy Demonstration Zone

- Compound Semiconductor Innovation & Development
- Green Ammonia-to-Hydrogen, Fuel Cells & Net Zero Tech.

AI Data Center

- Sovereign AI: 9.6 MW Computing Power & 60 PB Storage

Cyber Security & Smart Tech R&D

- AI Innovation Hub
- Smart Grid Demo Zone

Smart Rainforest Ecosystem Development

- Smart Healthcare, Dining/Lodging, Manufacturing & Retail Industry

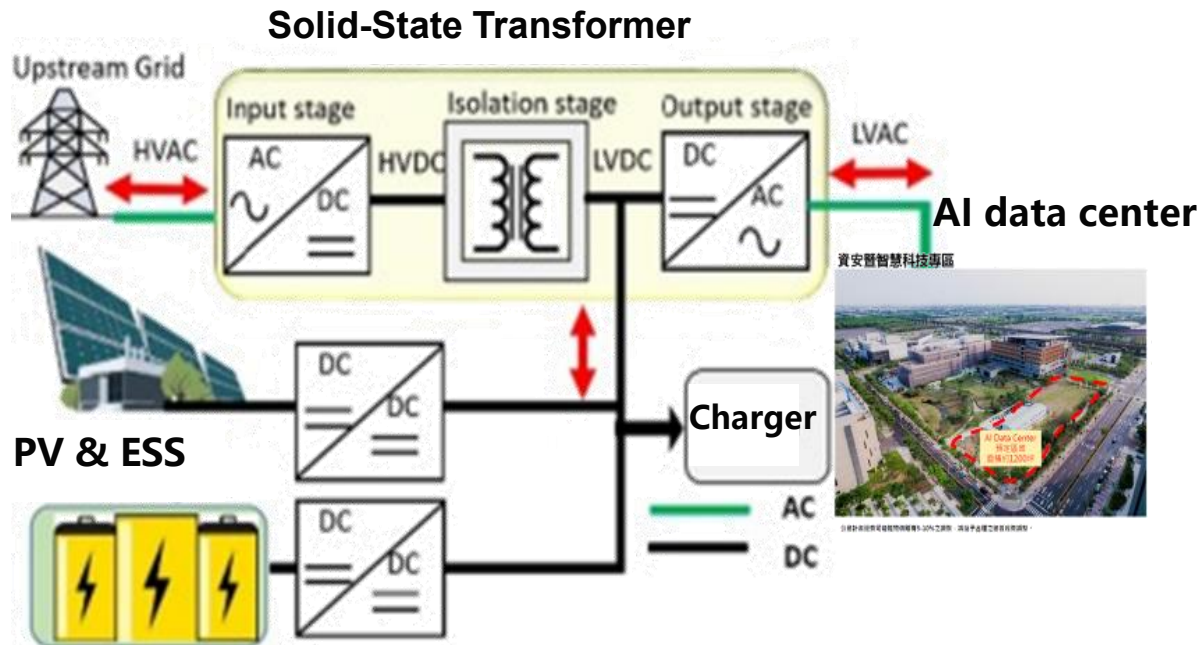


Value-added Industries, Talent Cultivation

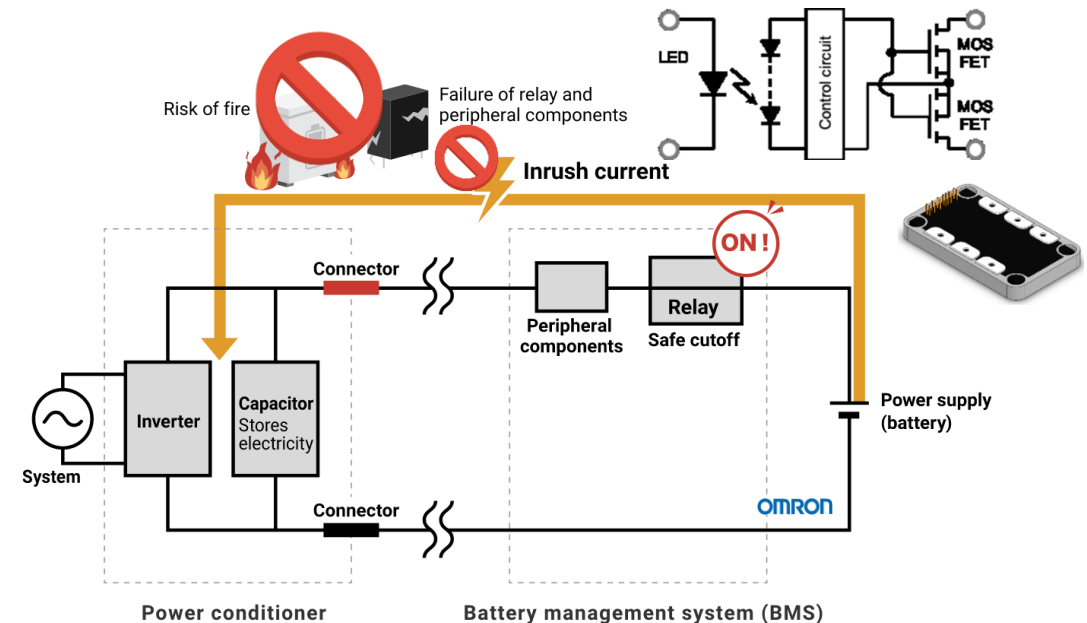
Industry-Government-Academia Research Collaboration

DC Micro-Grid Demonstration

- Driving growth in **compound semiconductor** industry through innovative system applications and service models
- Leverage Taiwan's expertise in power module packaging, testing, and subsystem technologies, combined with the system integration solutions, to create a validation environment

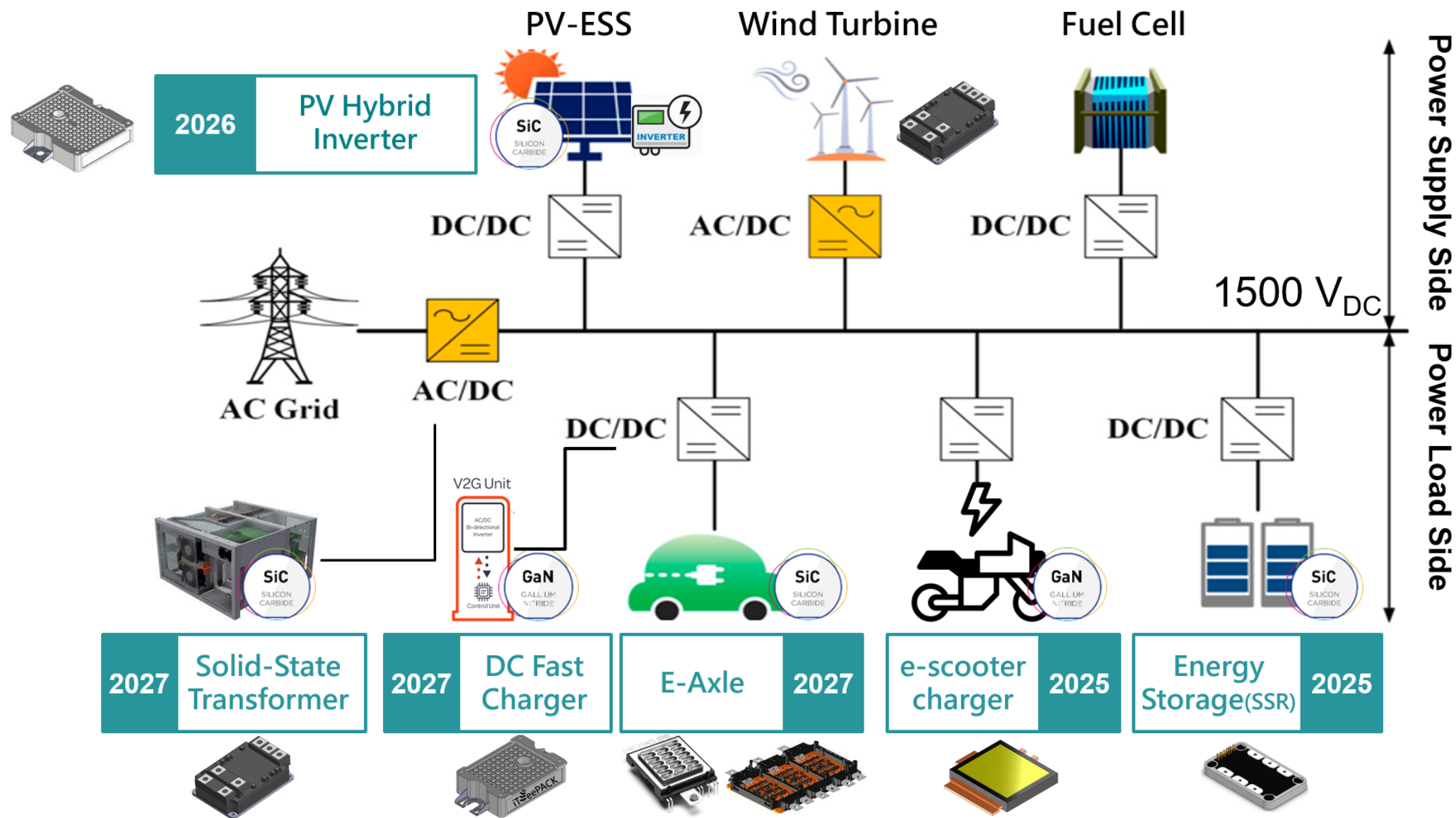


Demo. site at Shalun region



Solid-state relay

DC Micro-Grid Architecture (in progress)



Smart Rainforest Industry Innovation Subsidy Program

Empower all Sectors to Adopt Intelligent Technologies and AI

- Fostering a smart industrial ecosystem in southern Taiwan through **AI system integration** and **cross-sector collaboration**, leveraging the strength of the semiconductor industry.
 - ✓ Co-sponsored by multiple government departments including the **MOEA**, **NSTC**, **NDC**, and **MOE**.

Industry-specific initiatives rolled out year by year

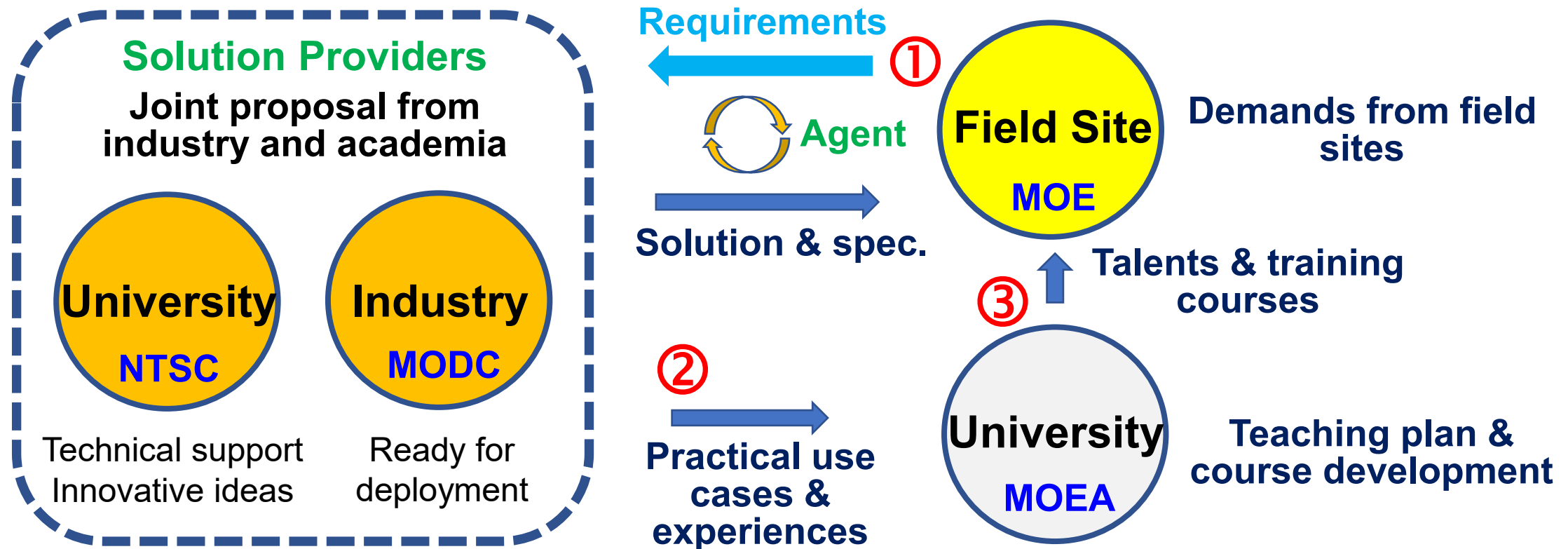


2025	2026	2027	2028	2029
Smart Dining/Lodging, Healthcare	Smart Dining/Lodging, Retail, and Services			
	Smart Healthcare and Agriculture			
	Smart Manufacturing for Metal Processing/Fabrication, Automotive, and other High-Value Industries			

Smart Rainforest Industry Innovation Subsidy Program

Promotion Strategies

- Tackle on-site demands and provide value-added advice and innovative ideas.
- Deliver solutions while fostering talents who are familiar with the field site.



Smart Rainforest Ecosystem Development

2025 Progress of Smart Dining Promotion

Industry Status

- Hiring difficulties, rising dining-out population, and growth of delivery platforms.

Area of Applications



Customer Side

AI Customer Service
AI Smart Ordering



Store Side

AI Procurement Forecasting
AI Operational Decision-Making



Production Side

AI Smart Kitchenware
AI Meal Scheduling

Challenges

- Labor shortage
- High staff turnover
- Service quality instability
- Non-Standardized Service Processes
- Competition and cost pressures
- Fragmented IT systems

Technical Solutions

AI Forecasting

Multilingual Service

AI Customer Service

Smart Vision

IoT Control

Smart Inventory

Meal Scheduling

Food Waste Sorting

Standardized Modules

Application Methods

- Voice Ordering
- Customer Service
- Membership Marketing
- Multi-Brand Restaurants

- Hotpot Restaurant Supply
- Barbecue Restaurant Supply
- Bakery Supply
- Buffet Restaurant Supply

- Buffet Restaurant Diverse Ingredient & Inventory Application
- Kitchen Automation

Smart Rainforest Ecosystem Development

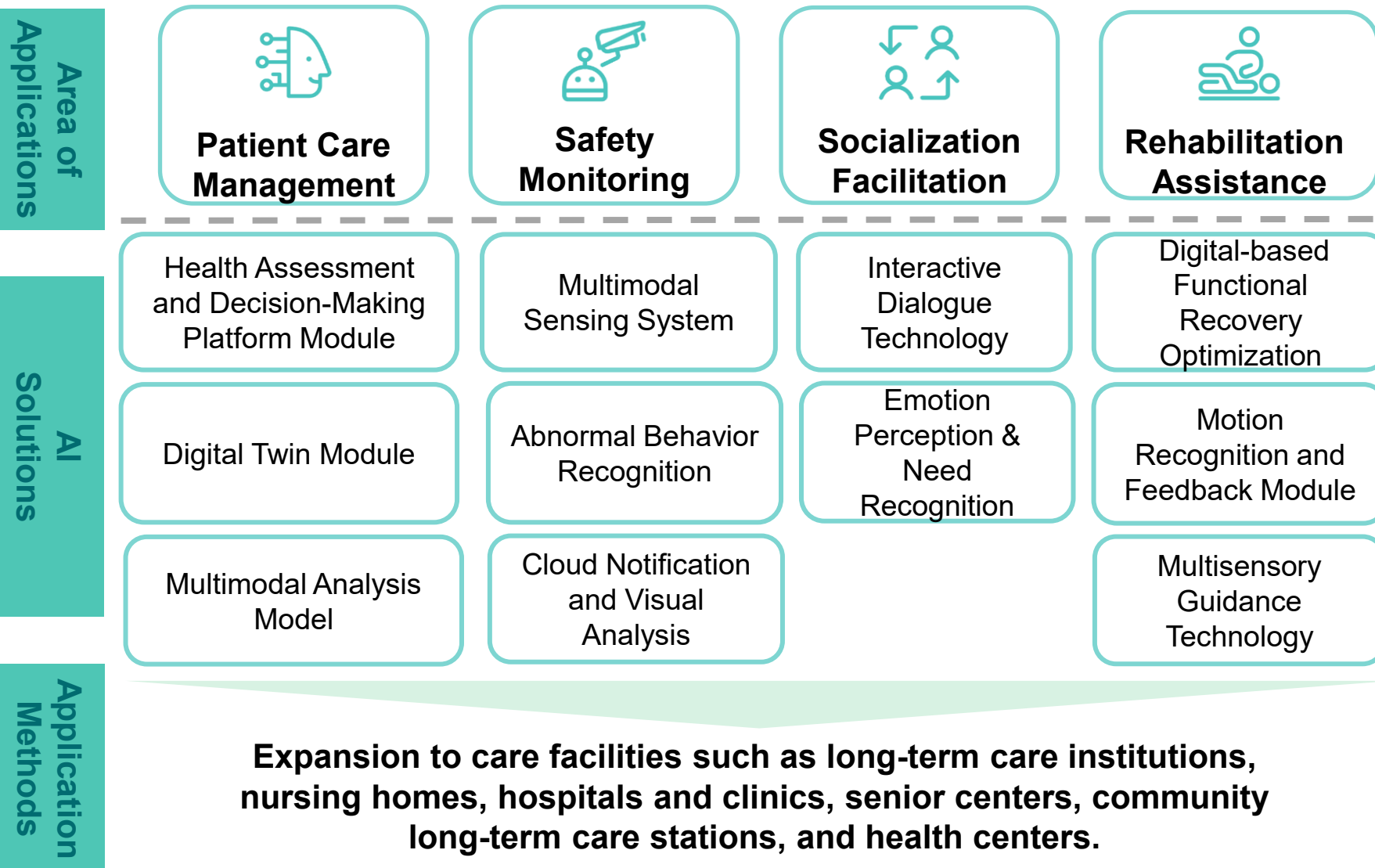
2025 Progress of Healthcare Promotion

Industry Status

- There are 830,000 people in need of care, but only 90,000 caregivers available.
- Taiwan is facing a dual challenge of increasing service demand and a severe shortage of caregiving professionals.

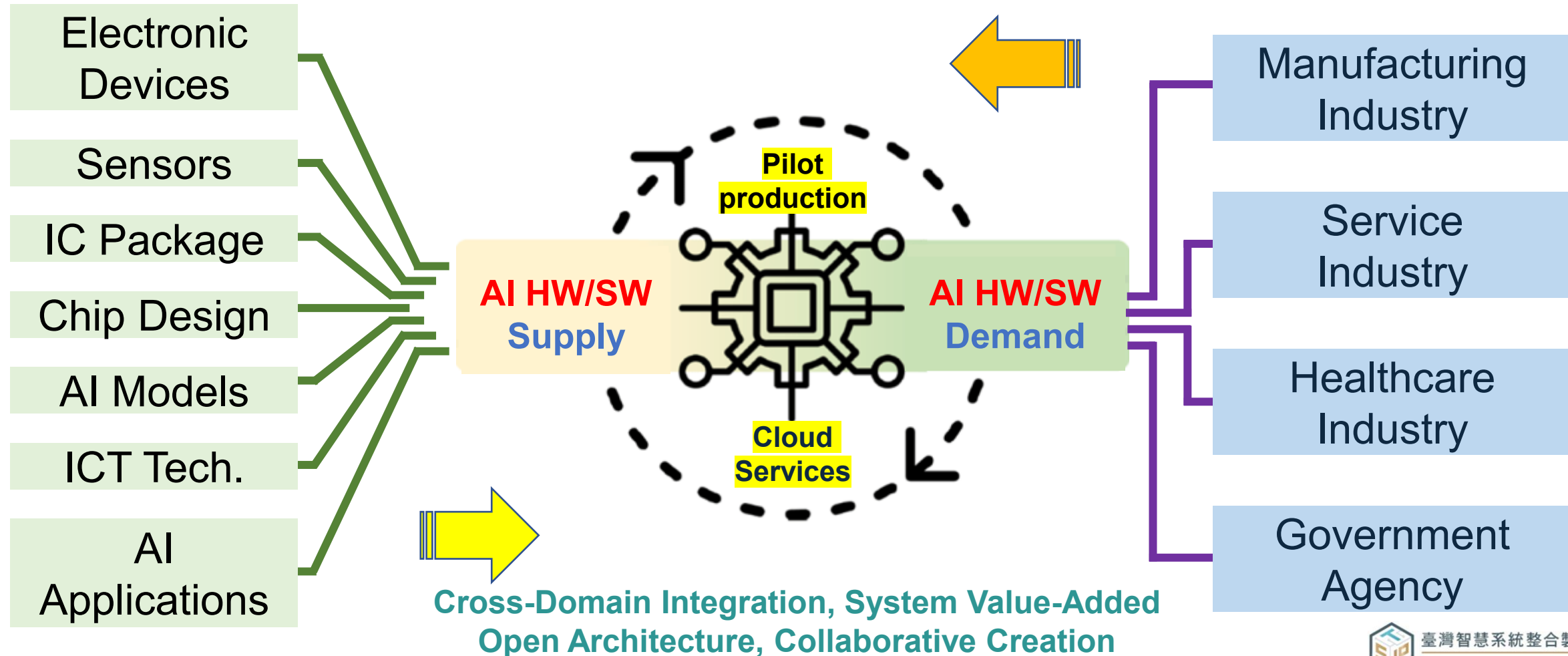
Challenges

- Difficulty in training personnel
- Diverse care needs
- Insufficient care facilities
- Lack of digitalization capabilities



Integration and Manufacturing Platform (TSIP)

A One-Stop Service Platform Integrating AI and Chip Design Services



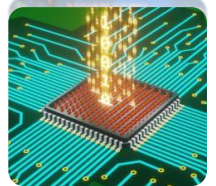
TSIP Services & Technical Supports

Service Models:

Consulting & Advisory, Matchmaking & Referral, Co-development, Contract Design, Value-Added Applications, Turkey Service, and Project/Application Support

Technical Supports:

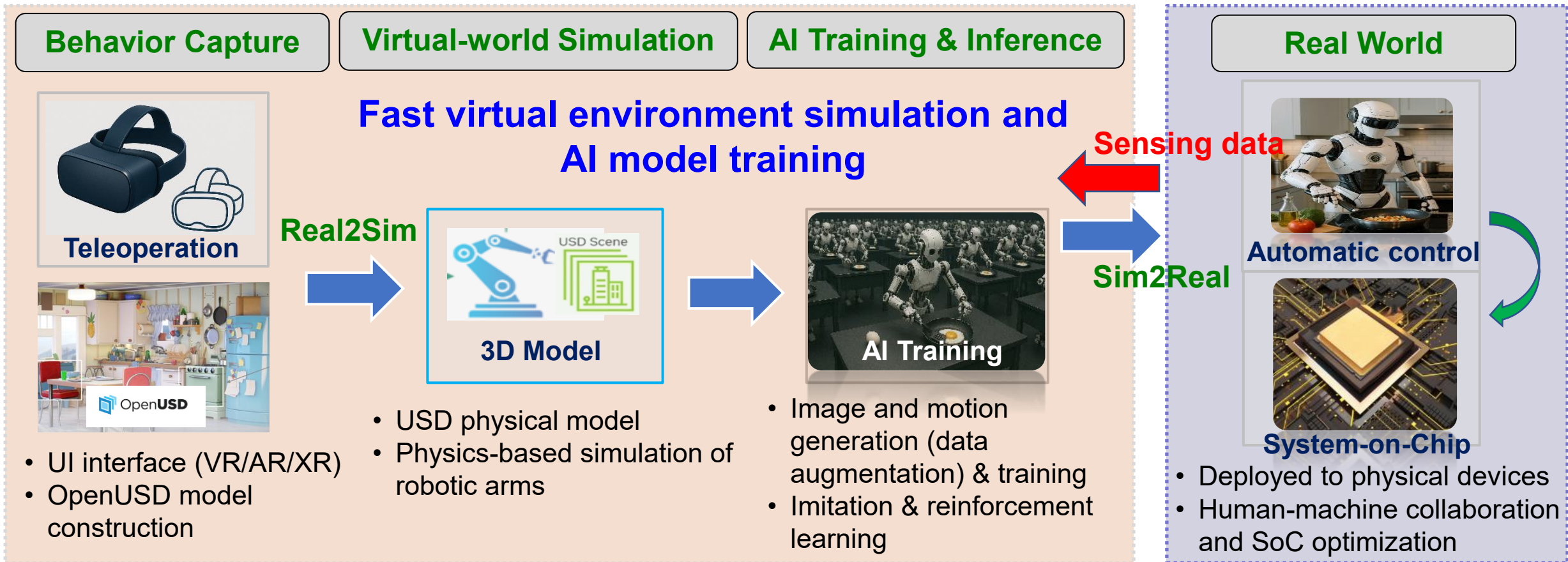
- **Cyber-Physical System Design & Specification Development**
 - ✓ Digital twins & physical AI integrated cross-domain system design techniques
- **AI Software Integration Platform**
 - ✓ Integration of data annotation, AI models, compilers, and rapid deployment software tools
- **Fast Prototyping for System Verification**
 - ✓ Providing SoC reference designs, FPGA, EVB, and other platforms to accelerate chip product validation
- **Multi-Industry Application Services**
 - ✓ Covering a broad spectrum of applications, including smart manufacturing, healthcare and service domains



- | | | | | | | | | |
|--|---|--|---|--|---|---|---|---|
|  Aco Smartcare |  ACS |  翔安生醫
A+ Cusense |  ShareGuru
SQLPilot |  ai FREE Interactive Tech
智遊科技服務 |  aiello |  sysinno |  ARCKING |  HiTi 誠信自動化系統
Industrial Automation |
|  Bio |  DeCloak™ |  DeepMentor |  數農智匯 |  高麗科技股份有限公司
Gosulip Technology Corporation |  Himax |  HOLTEK |  Horuseye |  iAmech
漢鏢科技 |
|  李輝資訊 |  JOREJIN |  Kapito Inc.
開多利財投 |  KENMEC |  KUANG JAY |  M31 |  MEC
Marketch International Corp. |  博鈞科技
MOBISNET TECHNOLOGY |  南寶樹脂
NANAO RESINS |
|  國立臺灣科技大學
National Taiwan University of Science and Technology |  neuchips |  NEW KEN |  NOVAKON
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東鋼鋼鐵結構股份有限公司
TUNG KANG STEEL STRUCTURE CORP. |  TURN CLOUD |  WHETRON |  WIAdvance
緯謙科技股份有限公司 |
|  YINGLIANG
盈亮健康科技 |  玉美嚴選
Yumei Farm |  ZEONIC
聚好得大藥廠股份有限公司 |  ZH展輝科技股份有限公司 |  Cupola360 |  TUNG HO GROUP
東鋼鋼鐵結構股份有限公司
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|  wixtar |  聯融科技股份有限公司
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Fresh & Fast Cold Chain Technology Incorporated |  楓康超市 |  GIO
OPTOELECTRONICS |  GoEdge.ai
豪聖股份有限公司 |  GOOD WAY |  FORMOSA
福爾摩沙遊艇酒店
FORMOSA YACHT RESORT |  震沅 |

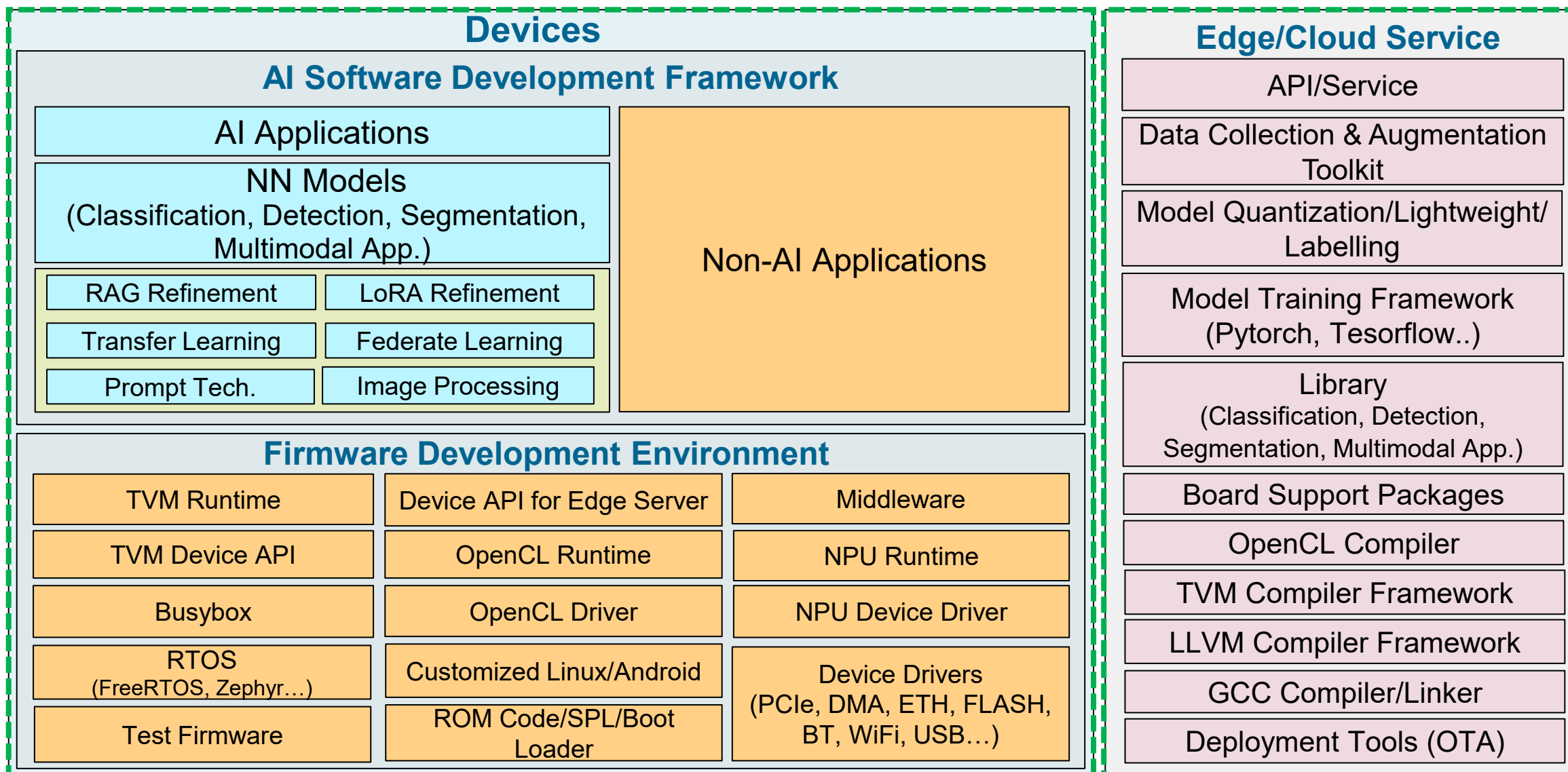
Cyber-Physical Integration Framework

- Built upon the **NVIDIA Omniverse/Cosmos/Issac Sim** framework, it is currently applied to smart manufacturing and service applications ([Joint R&D Lab.](#))



AI Model Deployment Framework

Heterogeneous Integration and Computing



AI Application Development Tool – An Example

Common S/W Modules for Smart Manufacturing

Field Validation



Metal Proc.



Shoes



Plast. Proc.



Smart Manu.



Smart Vehicle



Prec. Mach.

Cloud Computing

Production Line Process Parameter Optimization

Cross-Process Intelligent Automation in Production Lines

Efficiency Enhancement of Production Line Work Environment

Decision

Edge Computing

Path Opt.

Param. Opt.

Quality Assurance

Parameter Calibration

Abnormal Ident.

Data Augment.

Program Generation

Data Fusion

Vision Proc.

Feature Ident.

Process Automation

Env. Sensing

Behavior Sensing

3D points Processing

LLM/LMM/VLM OS Env.

LLM/LMM/VLM Compiler

LLM/LMM/VLM App. Models

Data Collection

Training & Analysis

Model Selection

Quality Prediction

Parameters Suggestion

Experience Feedback

Multi-Model Bayesian Kriging/Model-Free Reinforcement Learning

Analytics

Sensing



Vision



Temperature



Pressure



PLC



3D Printing



3D Metrology

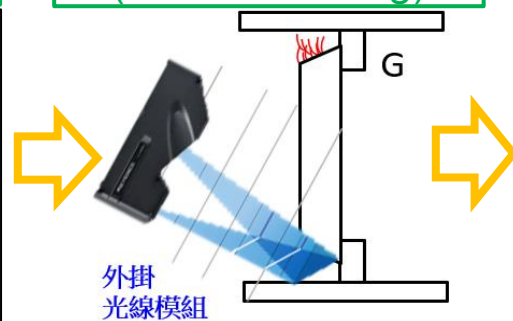
Digital Twin – Intelligent Welding Robotic Arm

- **Use Case:** ITRI cyber-physical steel structure solution — AI weld-seam inspection + AI path planning + domestic robot — enabling digital-twin intelligent welding for quality management on a real-world production line.

2D welding seam image recognition & localization

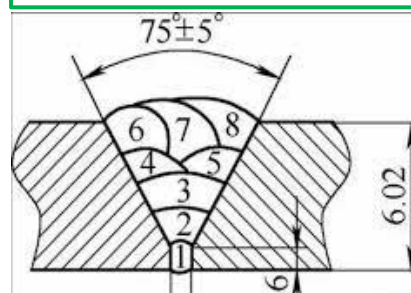


3D welding seam measurement (w/ arm sensing)

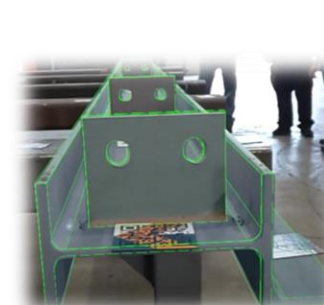


▲ Locate the welding start point

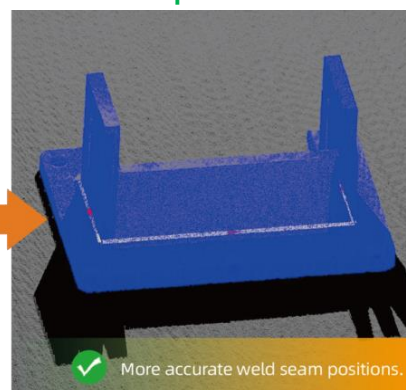
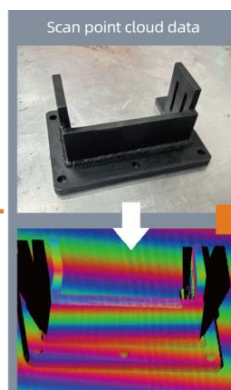
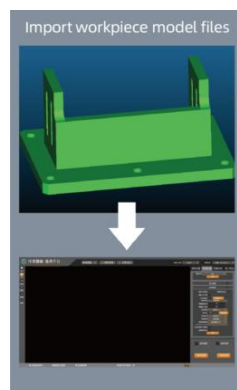
Welding seam and torch simulation



▲ Welding torch simulation



▲ Overlay inspection of virtual & physical objects



CAD model Scanned data Overlay inspection



Ensure stable welding quality



▲ Real-world application

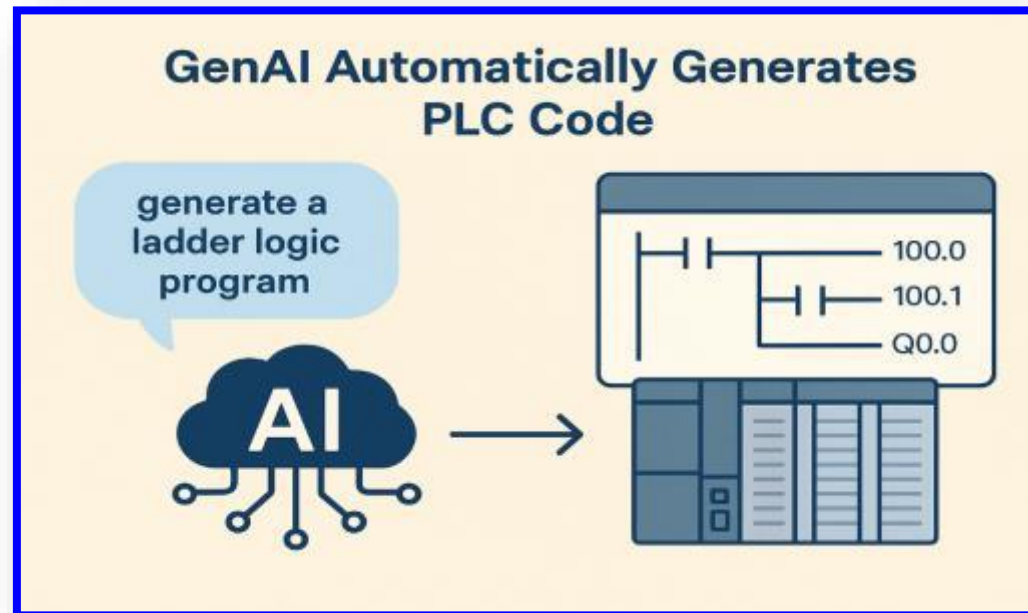
Smart Manufacturing

Generative AI-Enhanced PLC Intelligent Automation Control

- **Use Case:** Talent shortage of experienced PLC engineers makes the equipment vendors difficult to meet the massive demand for PLC program development required by downstream customers.

Utilize RAG scheme to enhance the accuracy of Prompts in Control Logic and I/O Configuration

Optimize the Gemma-3 (27B) LLM with in-context learning and iterative engineer feedback



Increase efficiency by 30% ↑
Over a hundred customers benefited from the process

Pass the test cases for Mitsubishi PLC, validated by collaborating with an SI on metal processing/heat treatment applications.

Reconfigurable System-in-Package Service

Pilot-Run Packaging and System Prototyping

Use Case:

- Partition the system into standalone functional modules, optimize the layout and interconnect, and improve cross-module coordination and system agility.
- Develop a single-layer miniaturized design encompassing computation, sensing, data access, and security modules to realize first-stage integration of diverse functional units.

Low-volume Pilot-run Requirements

System-level Module Integration

Challenges: Miniaturization & Robustness
Breakthroughs: Low-warpage Package Design
 & Multi-layer “Lego-like” Stacking

Compact Module
 (Integrate Multiple ICs)

HP Computing Module
 (CPU + Mem.)

AI Inference Module
 (AI Computing)

FPGA (AMD Versal Series)



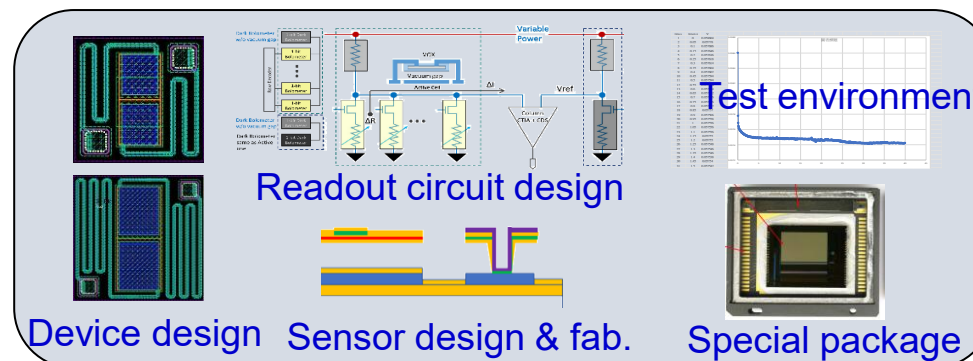
Group A: MCU/MPU

Group C: Camera/Sensor

Group B: DDR/Flash

Module-level single-layer
miniaturized design

Optimized design of
reconfig. interconnects



Package design
and assembly

Conclusion

- **Policy guidance** drives industrial innovation and regional growth.
- **Aligning with regional strengths and real industry needs** maximizes economic impact.
- **Leveraging both commonalities and uniqueness** across industries enhances effectiveness.
- In the AI era, **rapid system integration and validation** are key enablers of innovation and valued-added applications.

Contact Information



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Thanks for Your Attention

