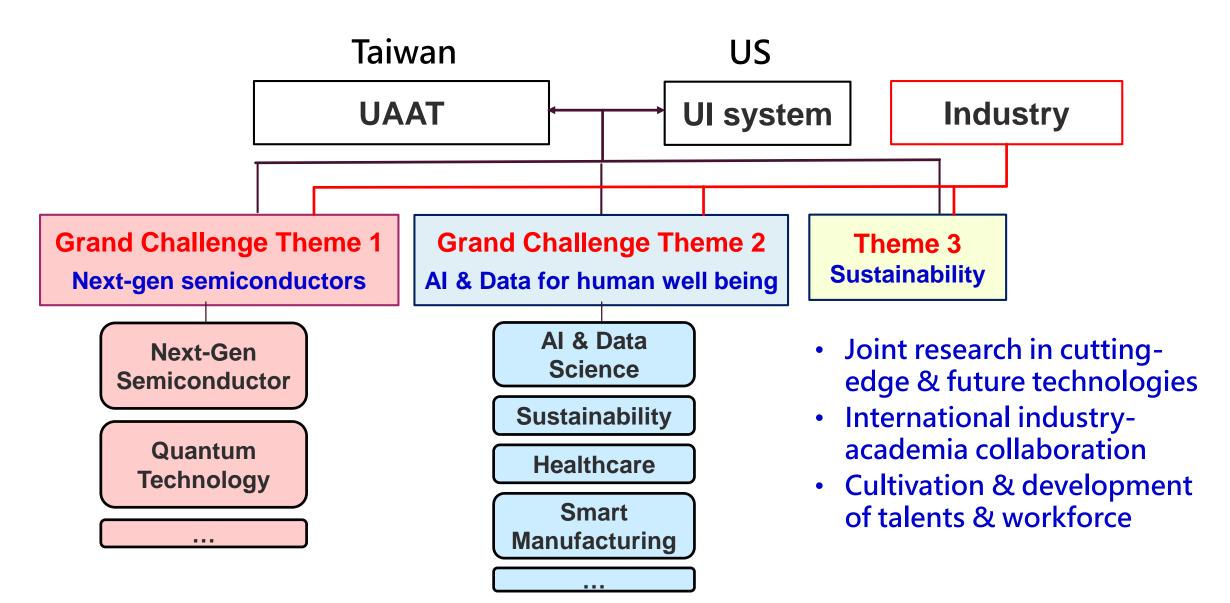# UI-UAAT Collaboration Planning

Grand Project Themes & Sub-topics

Collaboration Framework between UAAT & UI

Taiwan   US

UAAT   **UI system**   **Industry**

Grand Challenge Theme 1
Next-gen semiconductors

Grand Challenge Theme 2
AI & Data for human well being

Theme 3
Sustainability

Next-Gen Semiconductor

Quantum Technology

…

AI & Data Science

Sustainability

Healthcare

Smart Manufacturing

…

- Joint research in cutting-edge & future technologies
- International industry-academia collaboration
- Cultivation & development of talents & workforce

Next-generation Semiconductor (+Quantum)

1. **Advanced VLSI**: technologies beyond 1 nm, IC design innovation, advanced packaging (heterogeneous integration/interconnect, 3D/2.5D IC, chiplet stacking), advanced memories, advanced materials, smart manufacturing & metrology etc.
2. **Next-gen compound semiconductors:** power & high speed devices and integrated circuits
3. **Quantum computing/communication/information:** materials, devices, architectures, software, simulation application, integration of quantum processor with high performance computing etc.
4. **Quantum & nano photonics** for quantum technology

AI & Data for Human Well Being

1. **Advanced AI & Data technologies**: efficient and trustworthy deep learning, multimodal machine learning, generative AI, efficient mining on data streaming, geospatial information technology for urban environment and health, etc.
2. **AI hardware**: intelligent edge computing, LLM (large language model) accelerator, in-memory computing, low precision/analog computing, digital twins for urban environment/climate change/health, etc.
3. **AI applications**: smart healthcare, smart manufacturing, cybersecurity, robotics, autonomous/smart vehicles, computer vision, remote sensing, engineering, materials, agriculture, education, business, etc.

Sustainability

1. **Carbon** reduction, capture, storage and utilization for net zero
2. **Nature based solutions**: data, assessment, analysis and strategies
3. **Circular economy**
4. **Green energy:** renewable energy, energy storage, integration & operation
5. **Environment:** climate change, disaster prevention/recovery, water management, pollutant monitor/control, urban development, governance, resilience
6. Policy, economic, and technical analyses

Collaboration Schemes and Activities

1. Joint research（developing large Grand Challenge Project/joint lab、joint research center/consortium）
2. International industry-academia collaboration
3. Overseas/visiting research
4. Student & faculty exchange/internship program
5. Short-term courses/intensive courses/workshop
6. Academic conferences/professional activities
7. Joint/dual degree