Open Integrated Optical and Wireless Prototype System: AI/ML Platform, Software-Defined PHY via OpenCL & RU/RIS Antenna and Scattering Measurement Systems

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6G SNS ICE

Smart Networks and Services International and European Cooperation Ecosystem

Open Integrated Optical and Wireless Prototype System

One of Five 6G Research Projects Supported by Taiwan NSTC

(1) AI/ML Platform
(2) Software-Defined PHY via OpenCL
(3) Antenna and Scattering Measurement Systems for RU/RIS

Collaboration Interests in AI, Software-Defined Acceleration and RF OTA Tests for 6G

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Project Info

## Open Integrated Optical and Wireless Prototype System

Overview

- 4-year project, currently in its 1st year
- 7 subprojects
- 7 professors, 1 postdoc, 49 PhD & MS students

Goals

- High-speed optical networking technology
- Open network architecture prototype system
- Support for testing and measuring future 6G functionalities

Collaboration

- Build OSC Taiwan Lab
- Join Next Generation Research Group (nGRG)
- Research equipment provided by Nokia
- Industrial projects from 11 companies

Technical Portfolio (1/3)
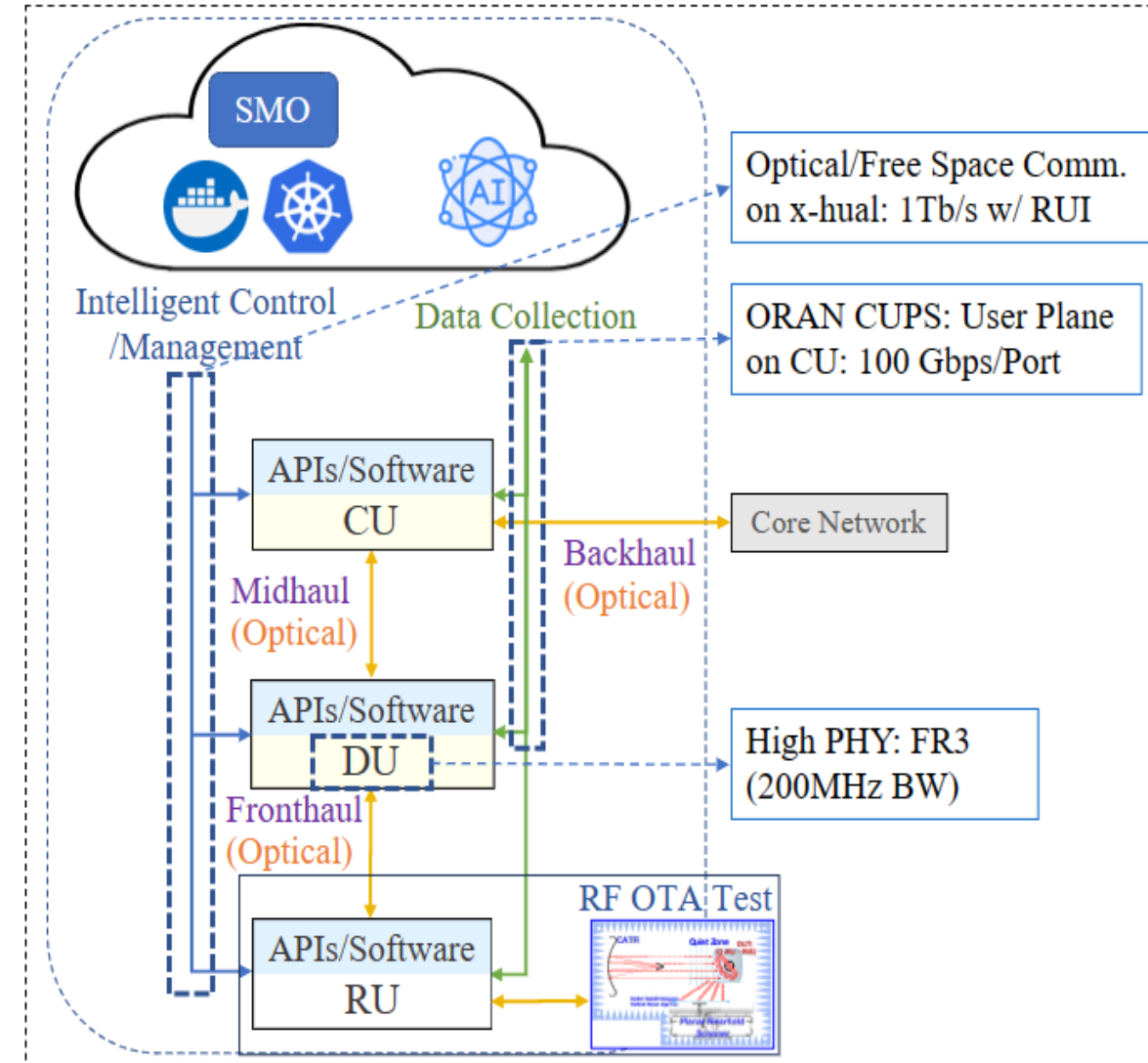
AI/ML Platform

- **Automated AI/ML platform integration**
- **Model training and management using Kubernetes and Kubeflow**
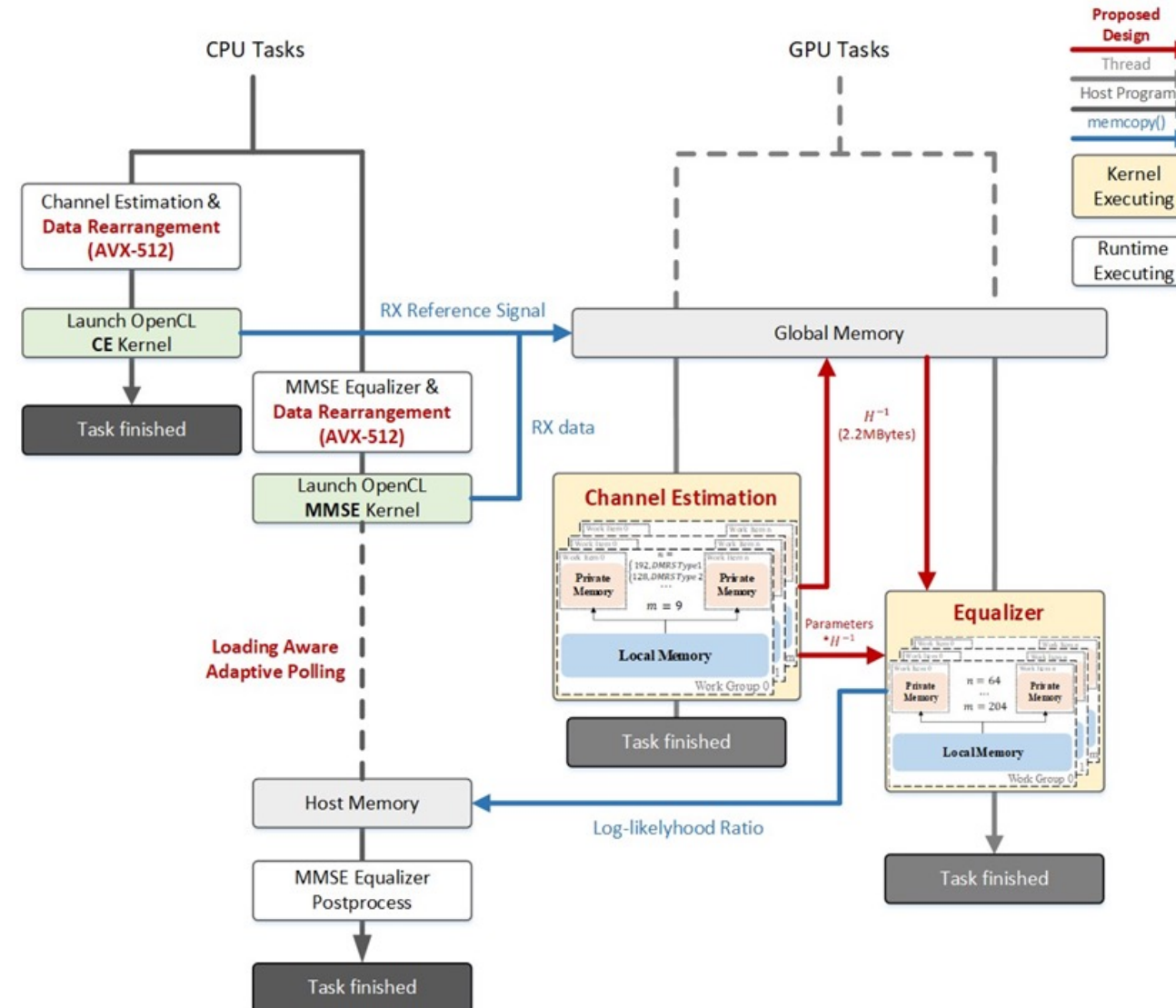- **Efficient model deployment and inference via KServe**
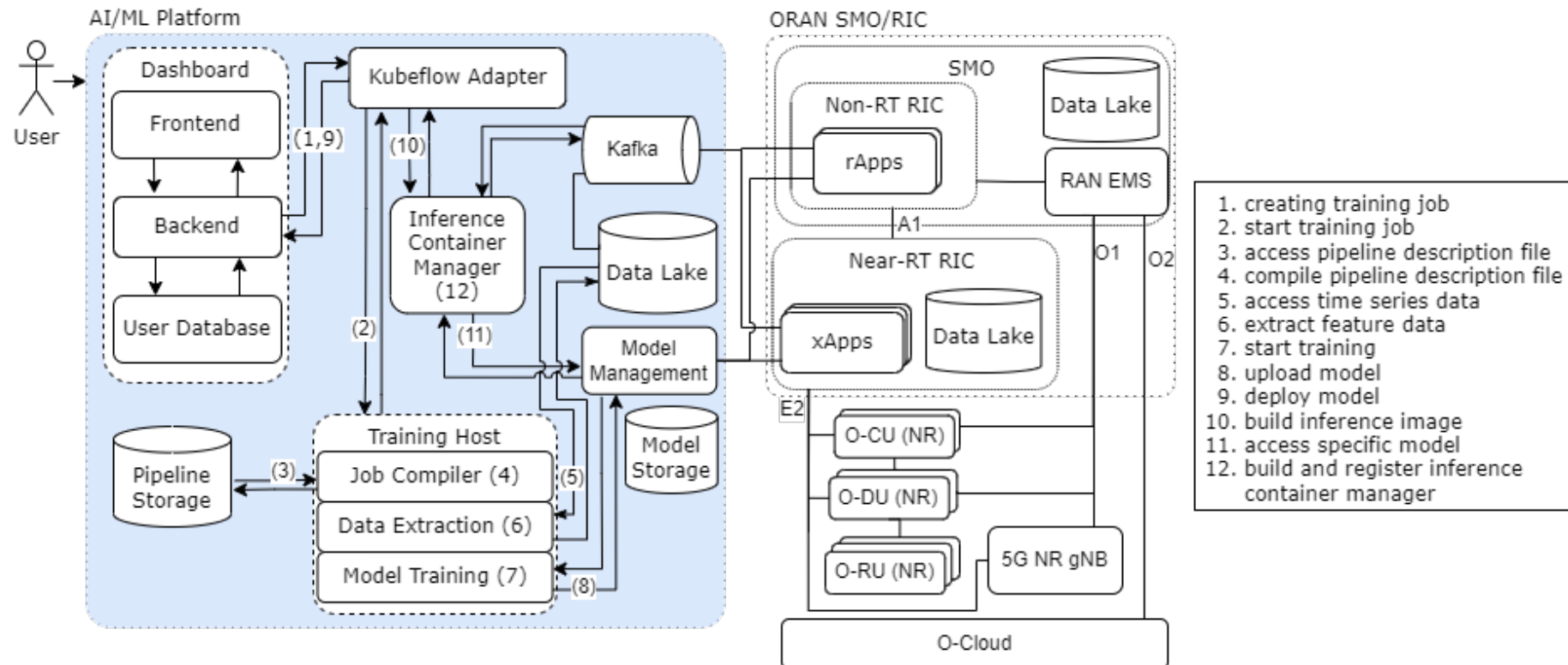
Workflow of AI/ML Platform

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Software-Defined PHY via OpenCL

- **Typical Software-defined PHY, trending in 5G/B5G O-RAN**
- **CPU-based implementations, i.e., Intel XEON & ARM**
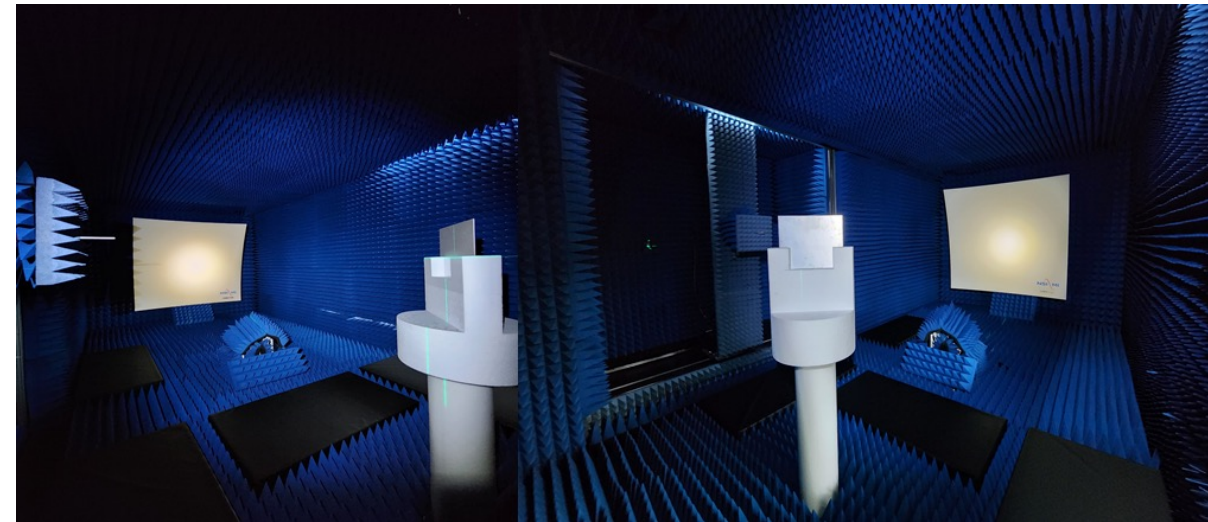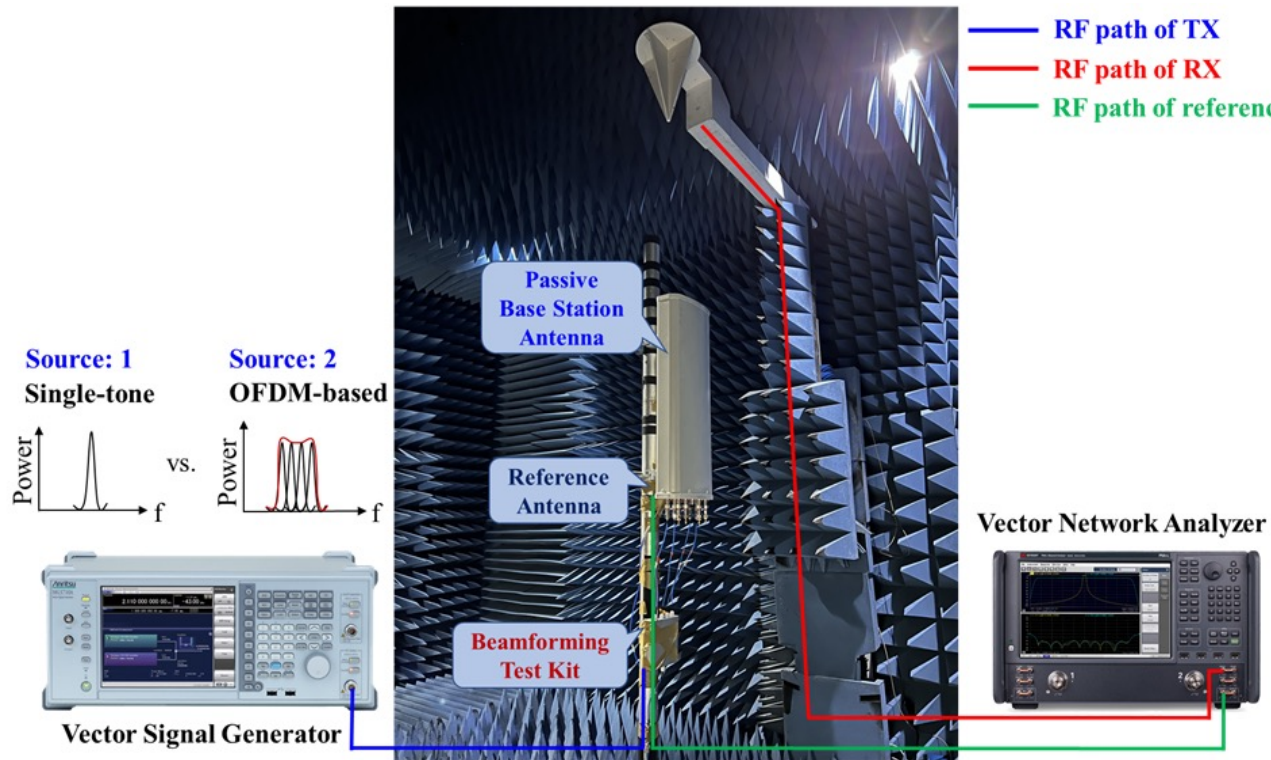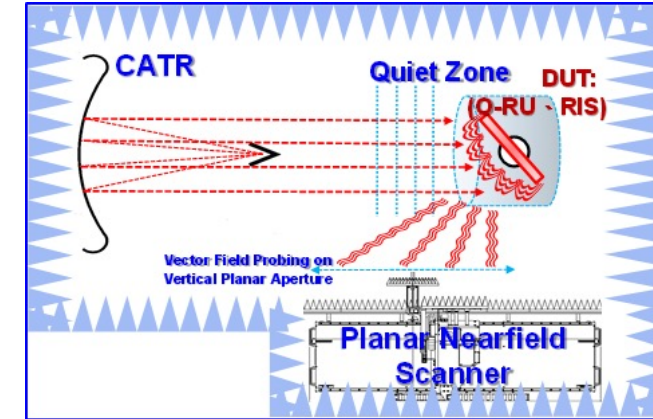- **Software acceleration opportunity via OpenCL on AMD GPU**

Design Example of UL acceleration by using OpenCL

Antenna and Scattering Measurement Systems for RU/RIS

- **Near-field & bistatic measurement systems for RU/RIS tests**
- **Evaluate & optimize RF coverages of 6G network deployments**
- **OTA Near Field: 430 MHz - 40 GHz; Bistatic: 8 - 40 GHz**

Plane-Wave Scene Emulation Range for
UUT Bi-Static Scattering/OTA Properties Qualification

Interests of Collaborations

What areas/levels of collaborations expected/interested:

- **Standardization of AI in telecommunication systems**
- **Exploring AI business models for 6G networks**
- **Exploring Software-Defined PHY in O-RAN**
- **Developing OTA near-field & bistatic measurement systems**
- **Providing chambers to measure RU/RIS properly**