

SMART-RIC6G: Smart Drift-Handling Enabler for RAN Intelligent Controllers in 6G Networks

Venkatesh Gani*, Dhruv*, Yaswanth Kumar L.S.\$, Ashit Subudhi*, Majid K*,
Abhishek Bhattacharyya*, Venkateswarlu Gudepu*, Bheemarjuna Reddy Tamma\$,
Koteswararao Kondepu*

* Indian Institute of Technology Dharwad, India

\$ Indian Institute of Technology Hyderabad, India



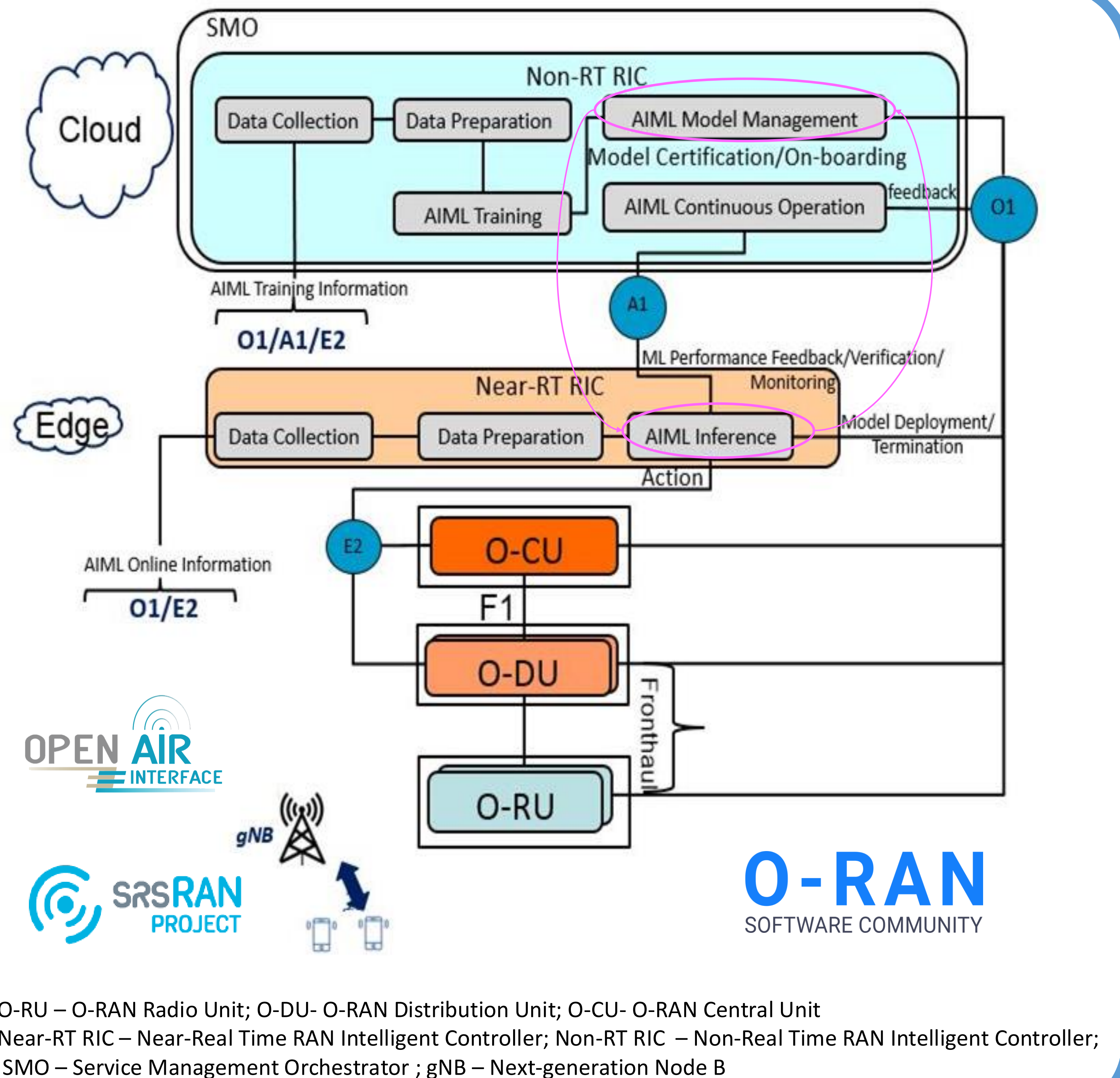
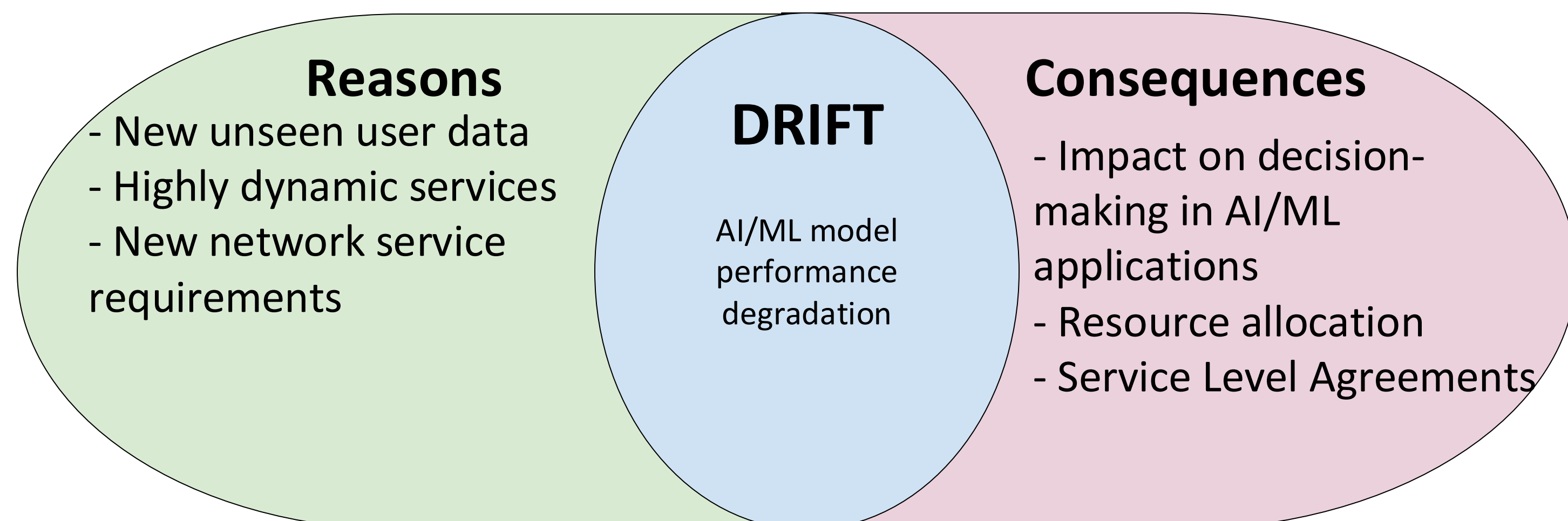
MobiCom 2025

Abstract :

This work demonstrates a real-time drift detection, analysis, and adaptation by leveraging an AI/ML framework integrated O-RAN. This is achieved with real time data collection from open interfaces which would be used by intelligent controllers (i.e., Non-RT RIC) for training and inference purposes of AI/ML models. The proposed drift-handling automation monitors network performance metrics to identify model drift with minimal data and computation overheads and then adapts to current network conditions by either retraining the model or replacing it with an available pre-trained model.

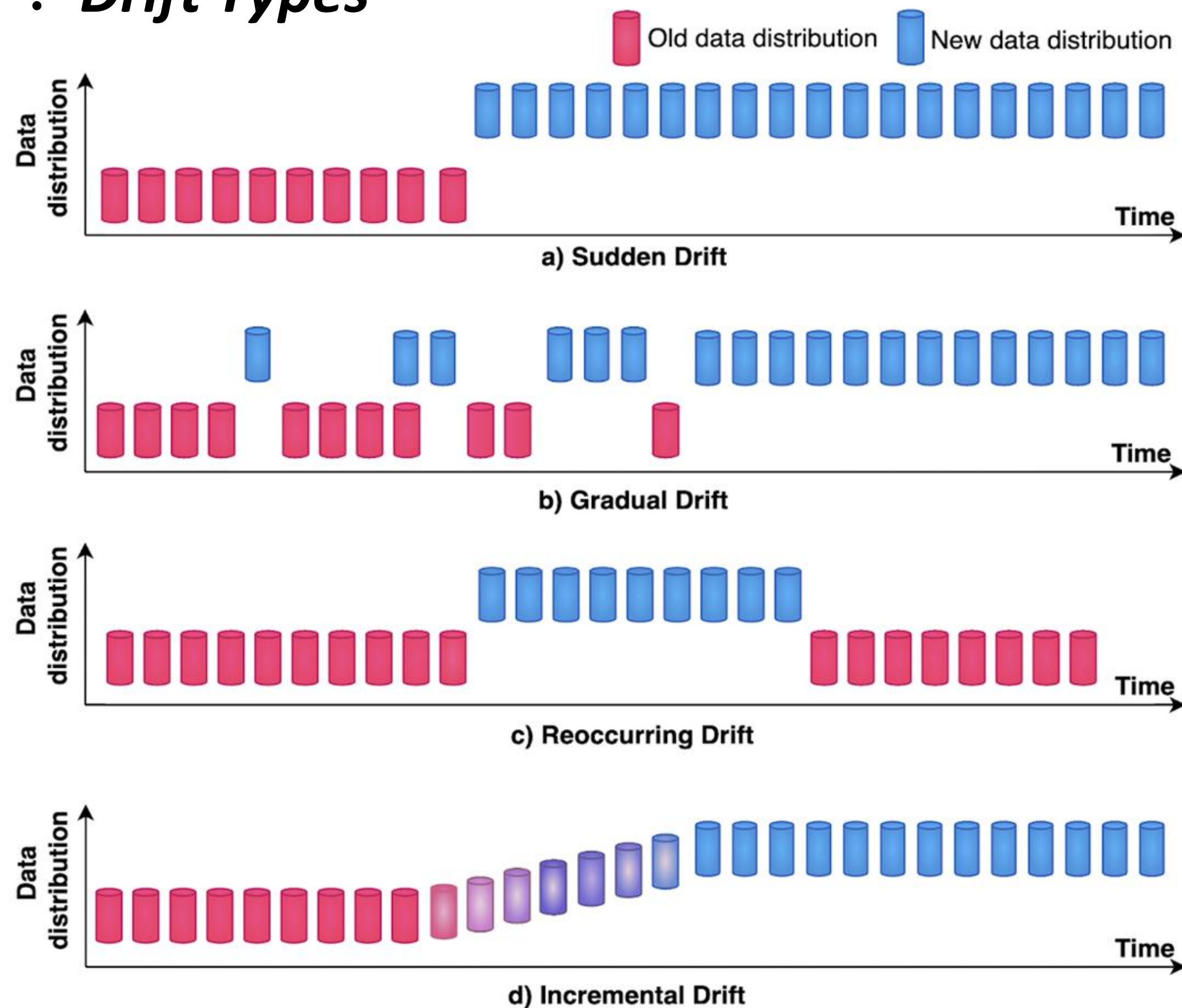
Motivation :

Utilizing AI/ML algorithms through RAN Intelignet Controllers (RICs)
→ enhances networks performance along with some challenges.

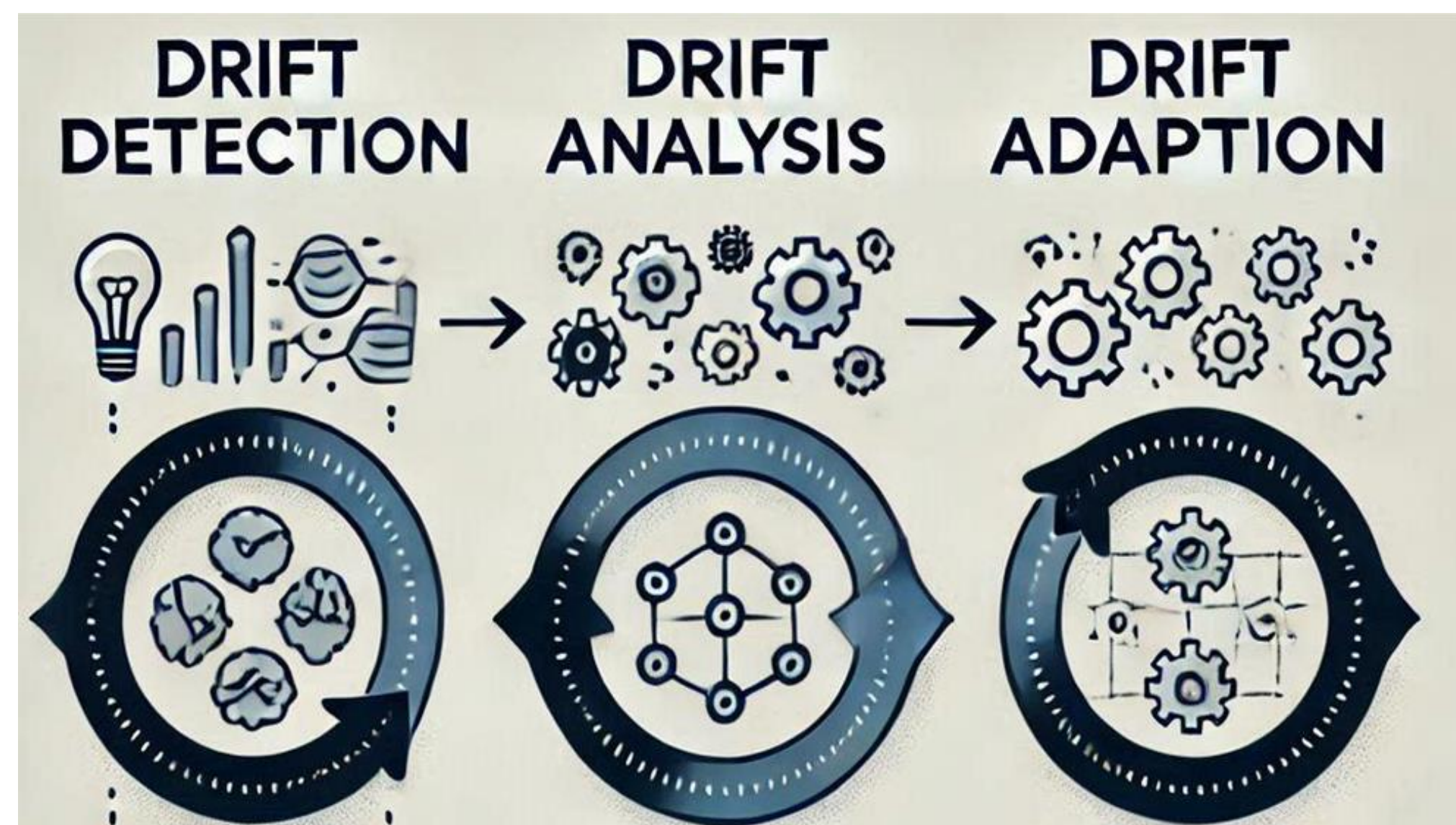


AI/ML Inference Drift Handling

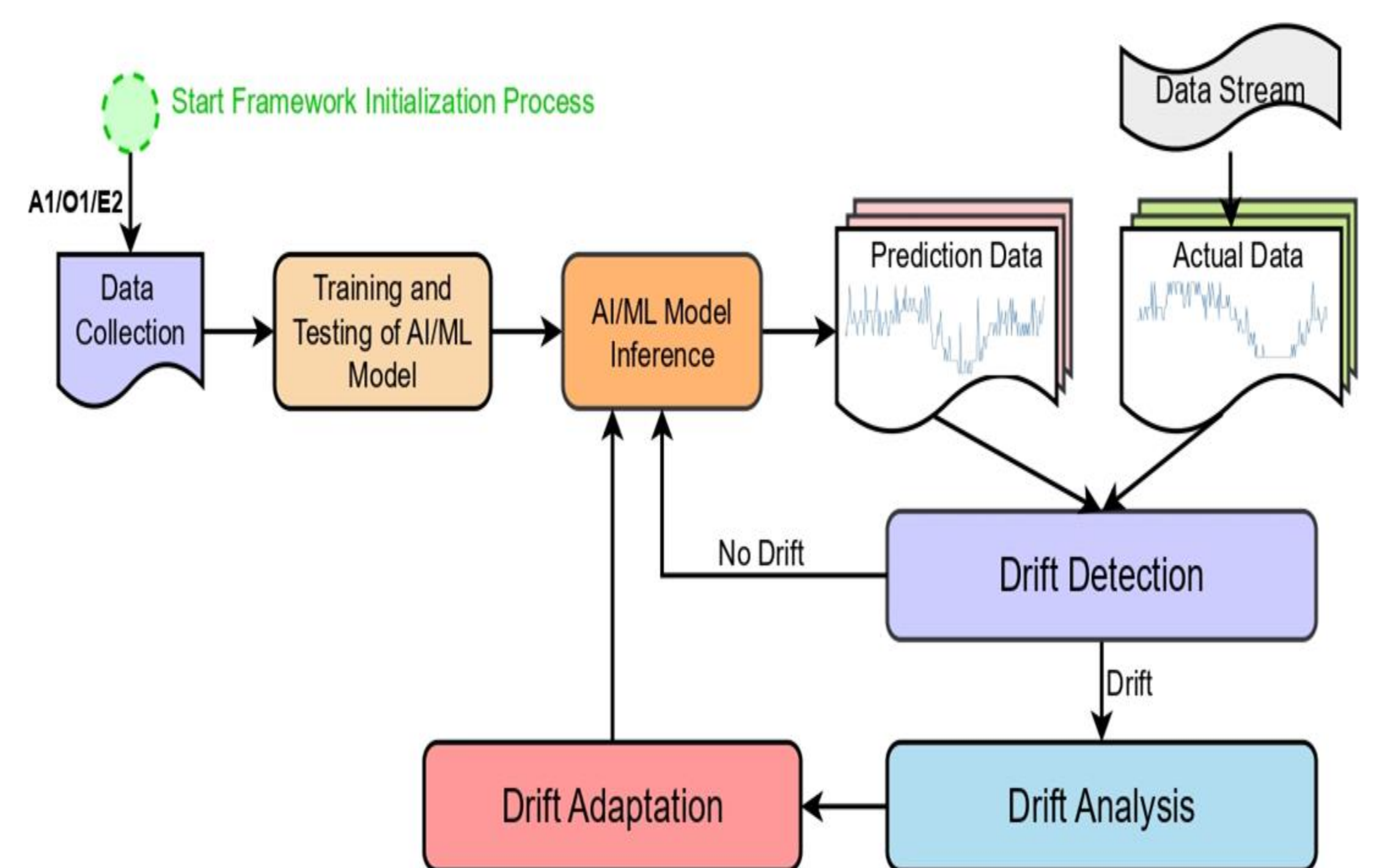
Drift Types



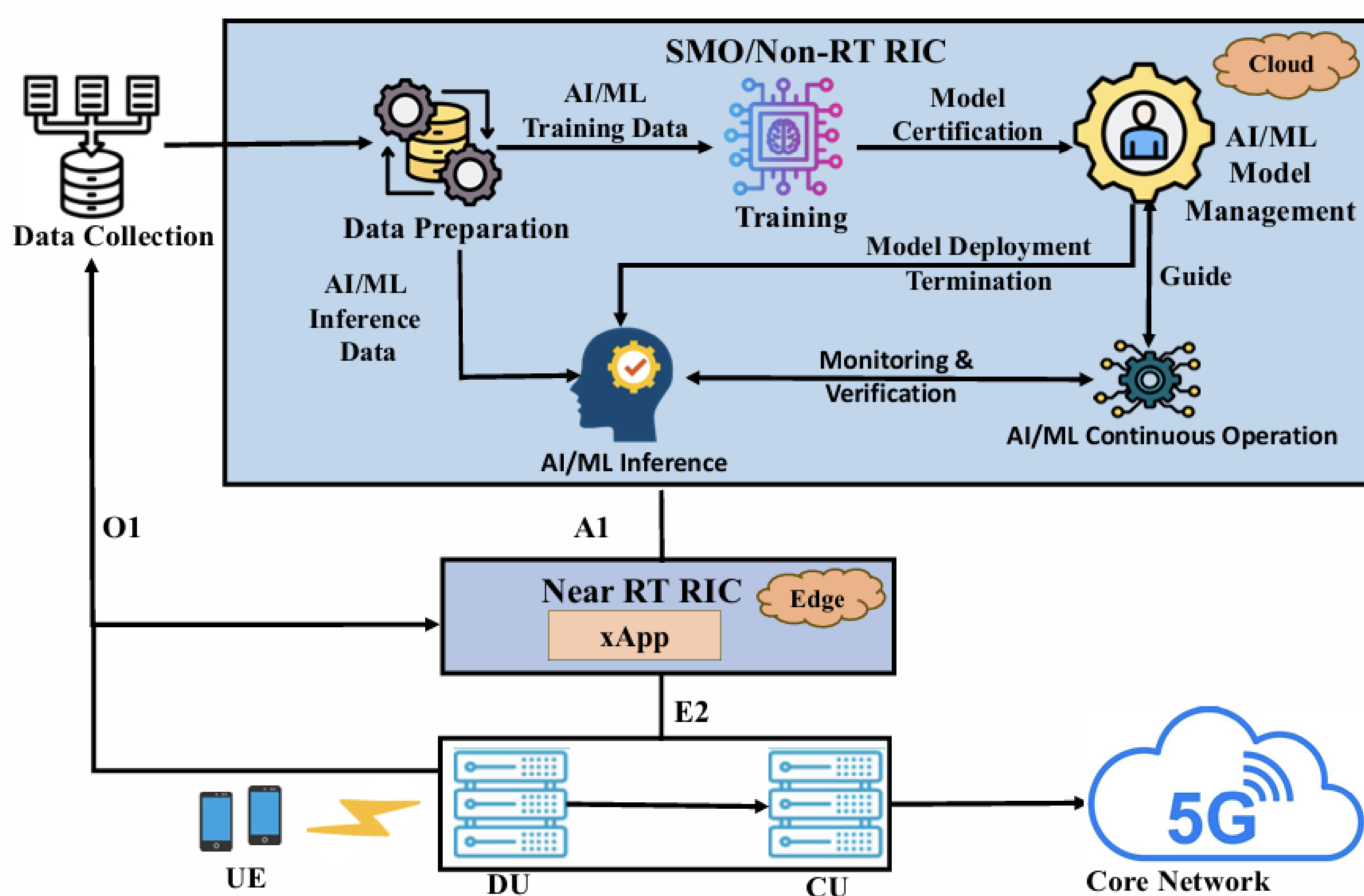
How to Handle the Drift in Open RAN?



Drift Handling Framework



Experimental Setup



- **Overall Goal:** Enable resilient, adaptive, and intelligent Open RAN for 6G by developing advanced AI/ML drift-handling, ensuring consistent network performance under dynamic conditions.
- **Specific Objectives:**
 - Real-Time Drift Detection: Detect and respond to AI/ML model drift instantly.
 - Proactive & Reactive Strategies: Use AI techniques to predict and adapt to drift events.
 - End-to-End Validation: Test and validate with ORAN SC, OpenAirInterface, srsRAN.
 - Standards Contribution: Advance O-RAN and 6G drift handling methodologies.