Theme: Machine Intelligence

- Sub Theme: Intelligent RAN Technology for nextG Cellular Networks

Next generation (nextG) cellular networks are expected to be significantly more complex than its predecessors. Existing radio access network (RAN) solutions necessitate heavy human involvement, making it infeasible to support these complex networks while maintaining reasonable operating costs. In the last few years, the telecommunication sector has come to recognize the importance of utilizing artificial intelligence (AI) technology to establish a fully automated RAN with excellent key performance indictor (KPIs).

To this end, several communication service providers and equipment vendors have already invested considerable efforts in developing AI technology to automate some repetitive operational tasks and reduce dependence on personnel expertise, such as AI solutions for near real time (RT) RAN intelligent controller (RIC) and non RT RIC in an open RAN (O-RAN) architecture. The development of intelligent RAN solutions faces numerous distinct technical obstacles that stem from telecommunication domains: 1) high network complexity, 2) massive and diverse proprietary data, 3) lack of industry-wide RAN interfaces, 4) scarcity of labelled datasets, and 5) limited computational power at base stations and UE terminals etc.

As part of this program, various solutions related to intelligent RAN technology are of interest. These include, but are not limited to

1. AI-based channel prediction
2. AI for CSI feedback enhancement
3. Smart modulation and coding scheme (MCS) selection
4. RAN parameter optimization for near RT RIC and non RT RIC
5. Intelligent massive MIMO beam management
6. Few shot coverage and capacity optimization (CCO)

7. Digital twin for RAN automation and optimization

8. AI for network deployment automation

9. AI for service quality assurance and improvement

10. AI for autonomous and self-driving networks

11. AI for network energy saving and efficiency improvement

※ *The topics are not limited to the above examples and the participants are encouraged to propose the original idea.*

※ *Funding: Up to USD 150,000 per year*