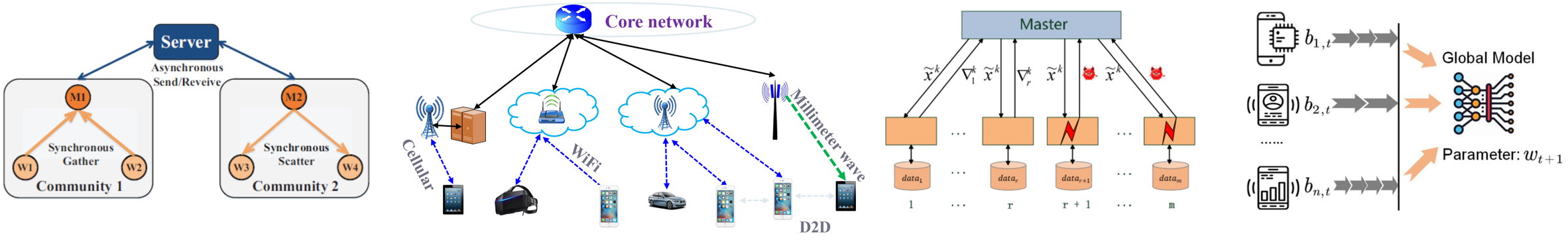
Edge AI: the Enabling Technology to Achieve Edge Intelligence

Edge Learning is a paradigm complementary to the cloud-based methods for big data analytics in the cloud-edge environment. It moves the training and inference to the edge environment to serve the delay-sensitive and privacy-sensitive applications, of which the data cannot be gathered to the cloud. We focus on the fundamental theories and enabling technologies for edge learning, including:

- **Collaborative learning architecture that enables learning beyond the cluster environment**
- **Learning-oriented communication scheme for accelerating the learning process by solving the limited communication resource problem**
- **Fault tolerance and resilience strategy designed for the purpose of learning reliability**
- **Data/model security and multi-level privacy**
- **Trained model deployment and update in resource-constrained edge environment**
- **Implementing testbeds and demo applications**

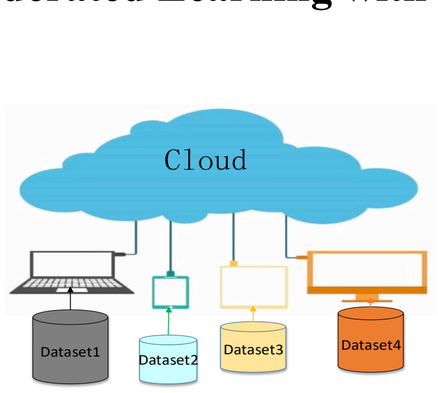


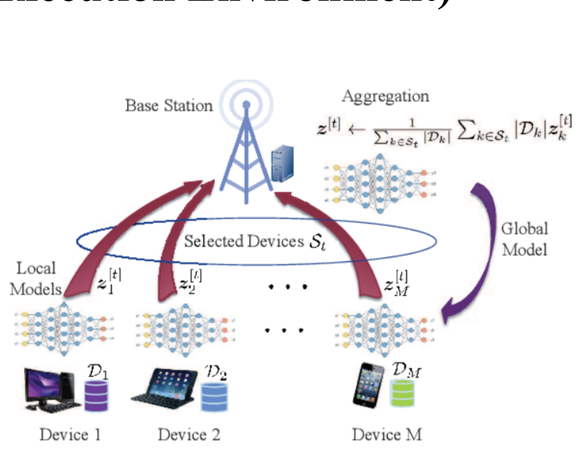
RGC Research Impact Fund (RIF), "Edge Learning: the Enabling Technology for Distributed Big Data Analytics in Cloud-Edge Environments", 2020-2025, Project Coordinator (PC), 7,640,000 HKD.
Published more than 50 academic papers on related topics in recent years, including UBICOMP, INFOCOM, MOBIHOC, ICNP, ICDCS, TON, TMC, TPDS, TC, etc.

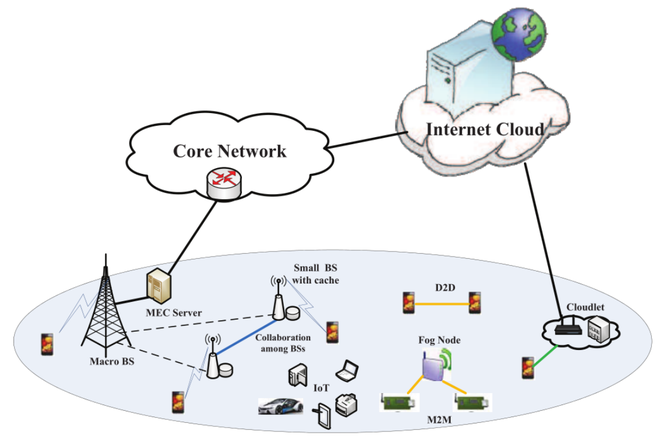
Federated Learning in Resource Constrained Mobile Edge Network

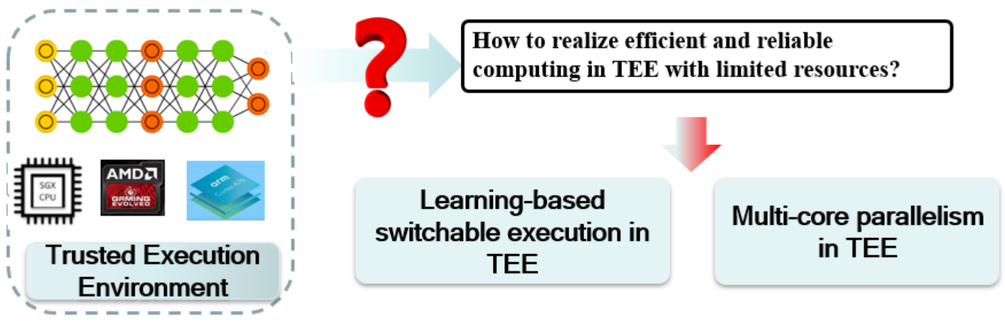
Federated learning (FL) has been proposed as a promising solution for future AI applications with strong privacy protection. It enables distributed computing nodes to collaboratively train machine learning models without exposing their own data. We focus on theories and algorithms for Federated Learning in mobile edge networks, including:

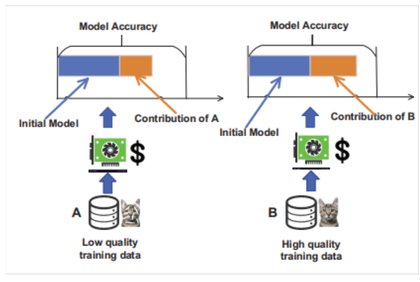
- **The fundamental theories with heterogeneous data in mobile edge computing**
- **Distributed learning frameworks, robust and efficient learning schemes in resource-constrained computing environment**
- **Learning-oriented resource allocation and computation offloading**
- **Incentive mechanisms in Federated Learning**
- **Federated Learning with TEE (Trusted Execution Environment)**

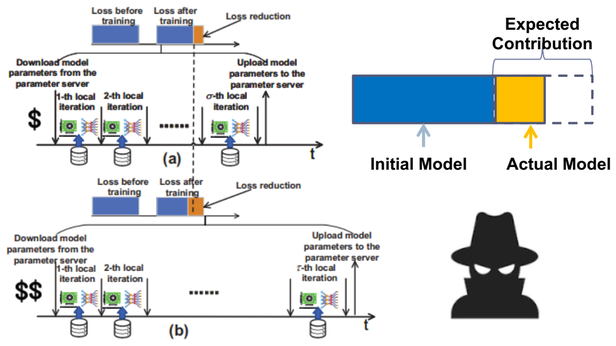












RGC General Research Fund (GRF)
"Federated Learning with Non-IID Data over Resource-Constrained Mobile Edge Networks", 2021-2023, PI, 1,057,394 HKD.
"Proactive and Cooperative Resource Allocation in Wide-scale Edges", 2020-2022, PI, 935,141 HKD.