ITUEvents

ITU-ML5G-PS-004: Federated Learning for Spatial Reuse in a multi-BSS (Basic Service Set) scenario

ITU

AI/ML in 5G

Challenge

Applying machine learning in communication networks

ai5gchallenge@itu.int

Host

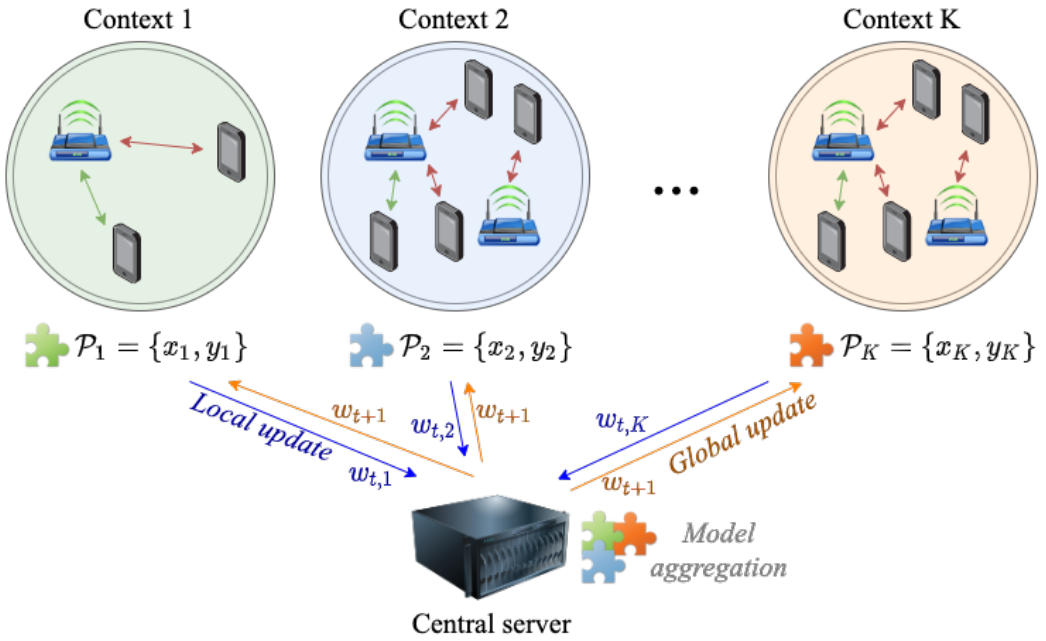
upf.

Organizer

ITU

The problem statement in a nutshell

- **Dataset:** Spatial Reuse in IEEE 802.11-ax[1]
  - Random simulated deployments in Komondor[2]
  - Challenges:
    1. Highly irregular patterns
    2. First and second-order interactions among BSSs
    3. WiFi-related phenomena (hidden/exposed nodes)
- **ML Goal:** predict the throughput
- **Method:** Federated Learning (FL)
- **Research goals:**
  - Exploration purpose (high risk)
  - Open research lines on MAC/PHY WLAN optimization using decentralized ML
  - Publish the results in an academic publication



[1] Detailed information here: (data set available here)
[2] https://github.com/wn-upf/Komondor

Host-Evaluation criteria

Score based on the average mean error:

$$MAE = \frac{1}{K}\sum_{k=1}^{K} | \hat{y}_k - y_k |$$

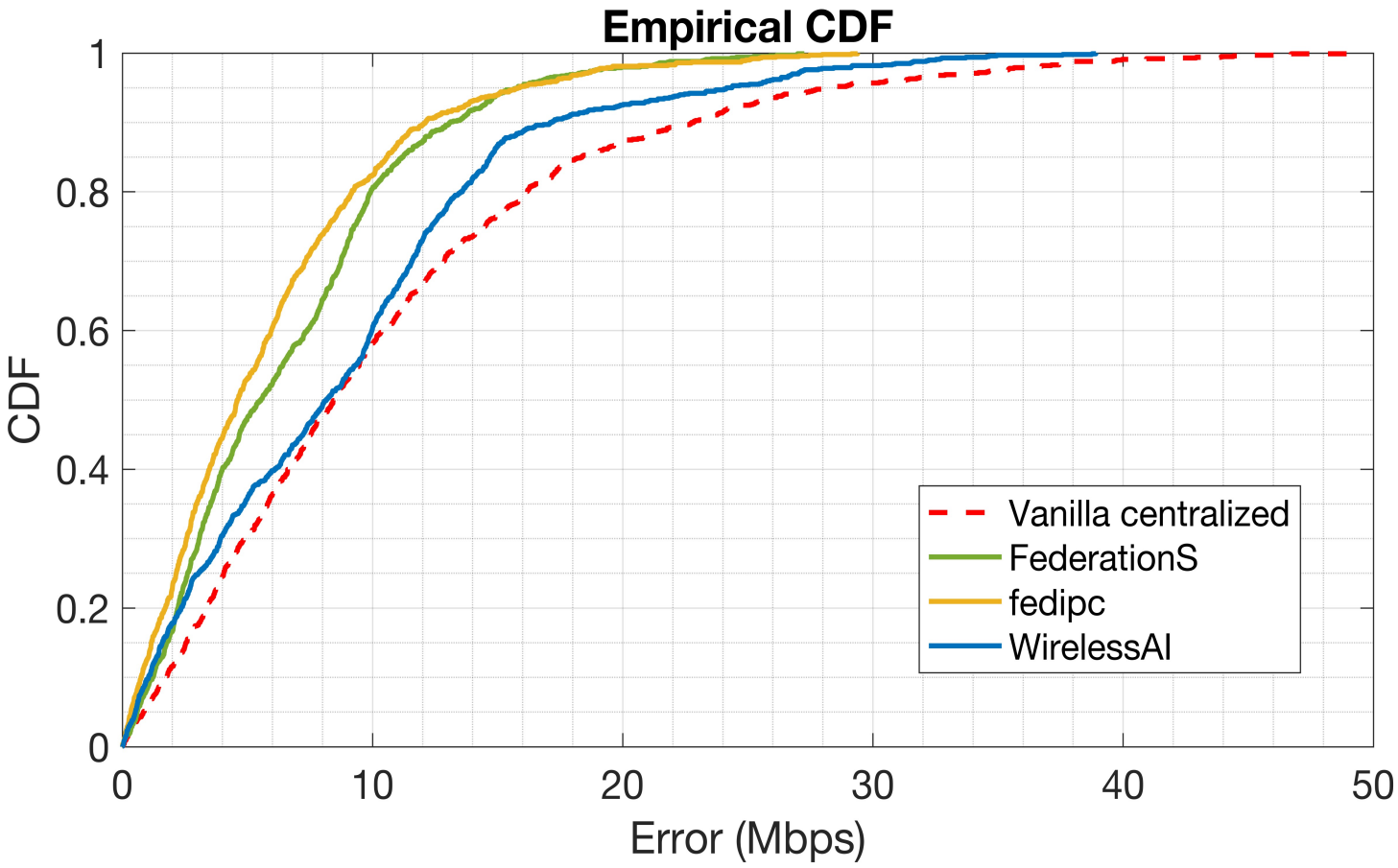
- Evaluated on the Test data set (K = 1,000 data points)
- Per-STA performance vs per-BSS throughput

Overall statistics

- **22 participants** (= **12 teams**) registered
  - **3 teams** submitted a solution
- **1 presentation** to introduce the PS
- **1 hands-on** session

Recommended candidates

1. FedIPC
2. FederationS
3. WirelessAI



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