



# Federated Deep Learning for Edge Computing (Part II)

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## OBJECTIVE

This project is the second part of a combined project. The goal of this project is to propose a network efficient scheduling algorithm for Federated Learning on edge devices. We will use the environment setup developed in Part I of the project to conduct experiments in an emulated environment. These experiments will evaluate the performance of this scheduling algorithm against a round robin scheduler as a benchmark and tweak the algorithm's parameters to fine tune it.

## Network Efficient Scheduling Algorithm

The network efficient scheduling algorithm picks the hosts with the highest efficiency for training during each round.

Efficiency is defined using a utility heuristic that takes into account both dataset size and the number of times it has been called on before.

$$Efficiency = \frac{Utility}{NetworkCost}$$

$$Utility = \frac{DatasetSize}{a * NumberOfTimesCalled + b}$$

## Results

The network efficient scheduling algorithm performs better, requiring 19% less network cost to achieve an model accuracy of 90%.

