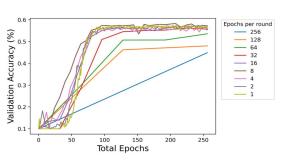# Autotuning in Federated Learning

By Matt Baughman, Ian Foster, and Kyle Chard

❖ Federated learning (FL) has been made easy with FLoX
  ➢ A serverless FL framework, built on funcX
  ➢ Removes need for users to configure systems for FL
❖ Users shouldn't have to configure FL experiments either!
  ➢ So we automate experiment hyperparameter selection!
❖ Understanding workload balance and aggregation
  ➢ Frequency of aggregation
    ■ Every epoch to once per experiment
  ➢ Comparing workload balance methods
    ■ Balancing on epochs, samples, or both
    ■ Epochs seems like the parameter to sacrifice
      ● Much more testing needed
❖ Currently testing on sensitivity to dropped endpoints

Figure 1: Comparison of different numbers of epochs per round for running FL on CIFAR-10.
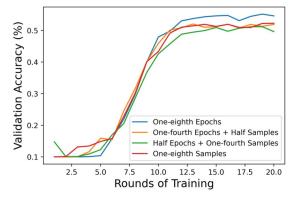

Figure 2: Comparison of balancing techniques to perform FL between two high powered endpoints and two additional endpoints with one-eighth the capabilities.