**Abstract—**

UAV network devices with Serverless Federated learning (SFL) empowers a wide variety of practical use cases such as (surveillance, data gathering, and commodity delivery etc. To run these SFL, UAVs need to collaboratively be training a machine learning (ML) model by exchanging the model parameters between UAV-to-UAV (U2U). Since UAVs are powered by batteries, energy efficient communication network topology for model parameters exchanging is of paramount importance. The way parameters are exchanged between the UAVs can effect the battery efficiency, convergence speed.

In this paper we propose an energy efficient network topology optimization methodology for SFL in prolonging the lifetime of the UAV battery which will increase of UAV-assisted network lifetime maximization in the presence of multiple UAVs