

CPS Medium: Learning through the Air: Cross-Layer UAV Orchestration for Online Federated Optimization

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<https://sites.google.com/view/nsf-ccpls>

Challenge:

How to enable ensure the functionality of Collaborative Cyber-Physical Learning Systems (CCPLSs) given the large-scale, high-dimensional, heterogeneous and time-Varying datasets generated by these systems?

Solution:

Integration of unmanned vehicles, in particular Unmanned Aerial Vehicles (UAVs), in CCPLS through a unified design of the associated learning, networking, and communication aspects.

Scientific Impact:

Immediate application in smart and connected agriculture in remote areas, but theory, algorithms, and foundation broadly applicable

Broader Impact:

- *Impact on industry:* Development of UAV-assisted CCPLS for a variety of application domains, manufacturing of UAVs and other unmanned vehicles tailored for CCPLS.
- *Research dissemination and curriculum development:* Develop new course modules for the courses taught by the PIs, e.g., Optimization for DL, Wireless Communications, Communication Networks.
- *outreach and community engagement:* Organizing CPS Rising Stars Workshop and mentoring undergraduate interns and researchers.

