A drone with four propellers and a camera mounted below it is shown flying over a field of green, leafy plants, likely soybeans. The background is a hazy, golden field under a clear sky.

Interdisciplinary Applications for Unmanned Aerial Vehicles

Jenna Kline

PhD Student

The Ohio State University



What are unmanned aerial vehicles (UAVs)?



Interdisciplinary Applications of UAVs



DIGITAL AGRICULTURE



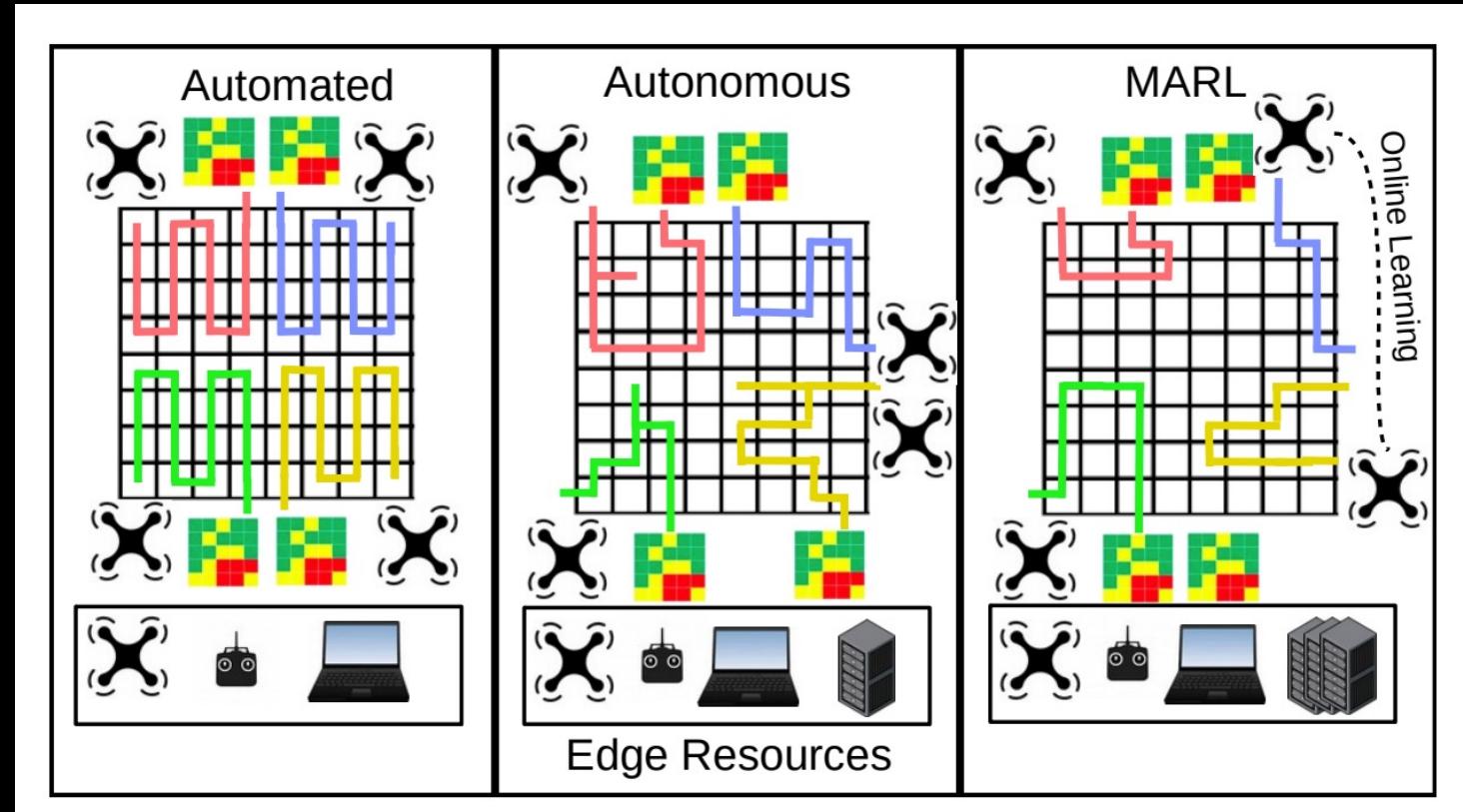
RESILIENT FORESTS



ANIMAL ECOLOGY

Digital Agriculture

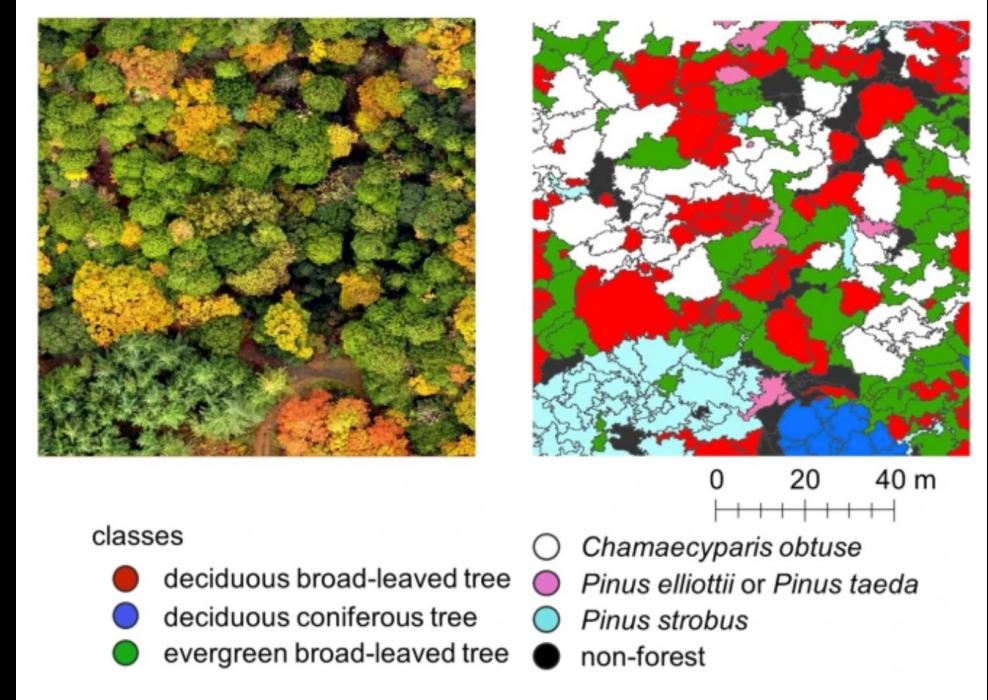
- Autonomous UAVs enable smart-sampling of large areas
- Build software-defined cartography for crops, i.e. detailed maps for farmers



Types of swarms: Automated, Autonomous, and MARL [1]

Resilient Forests

- Managing forests to be resilient in the face of stressors
- Traditional methods of mapping forests are expensive, time-consuming, and dangerous
- Difficult to detect forest diseases before spreading
- Autonomous UAVs can survey large areas quickly



Identifying trees using UAV RGB image and deep learning [2]

Animal Ecology

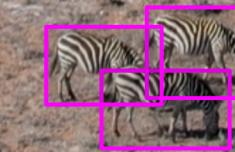
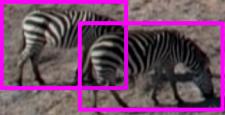
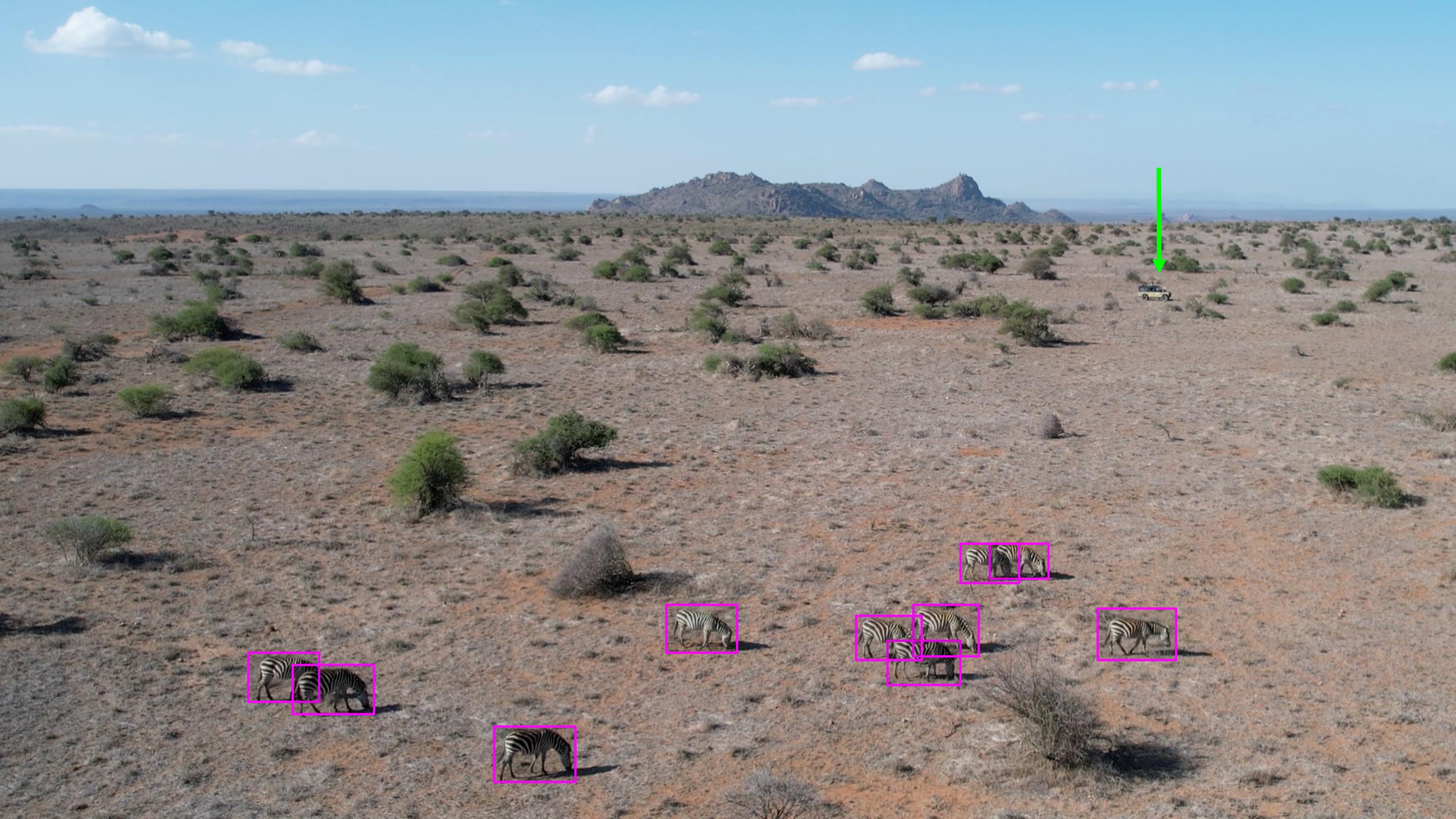


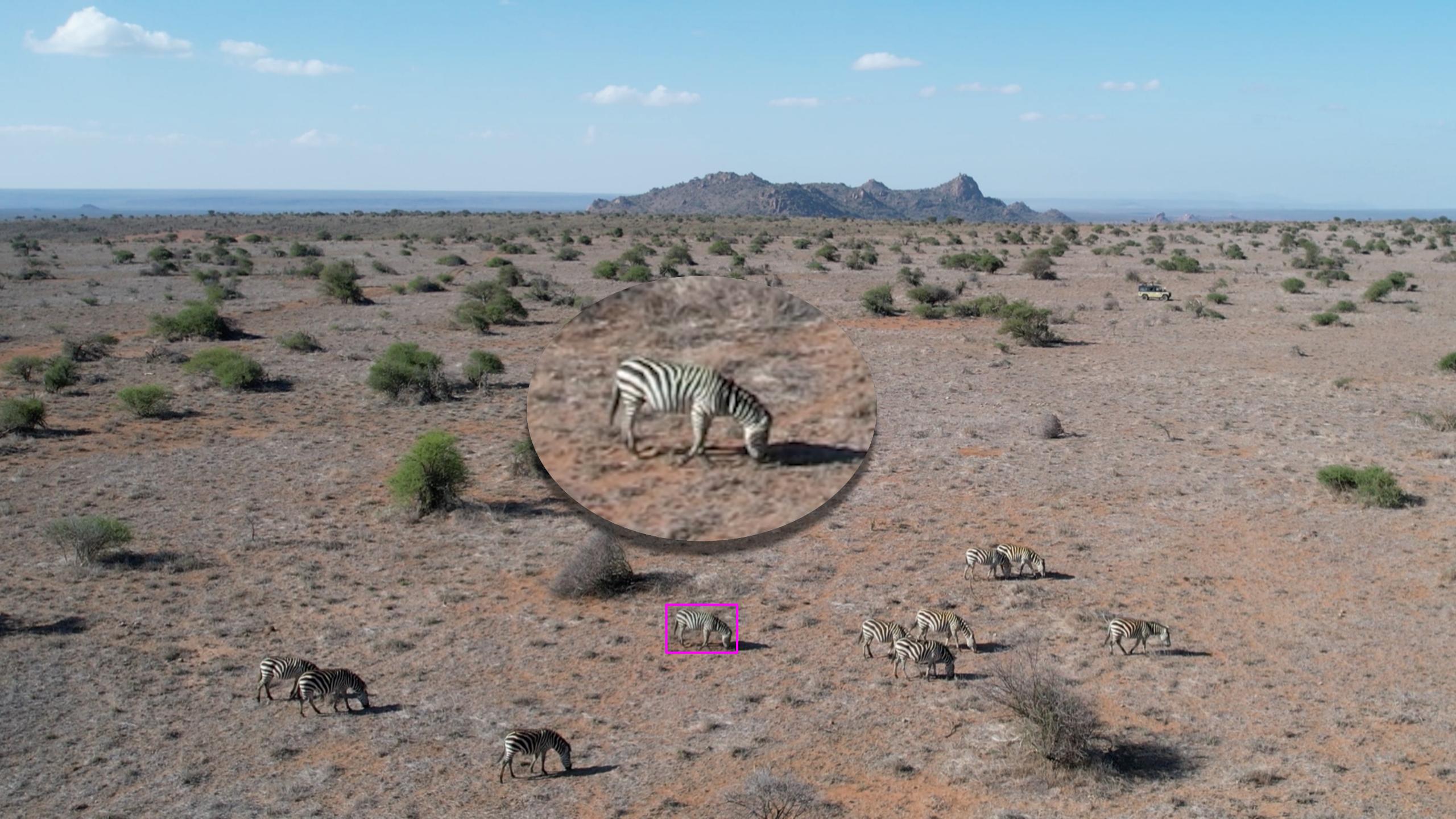


Traditional Data Collection



Data Collection with UAV

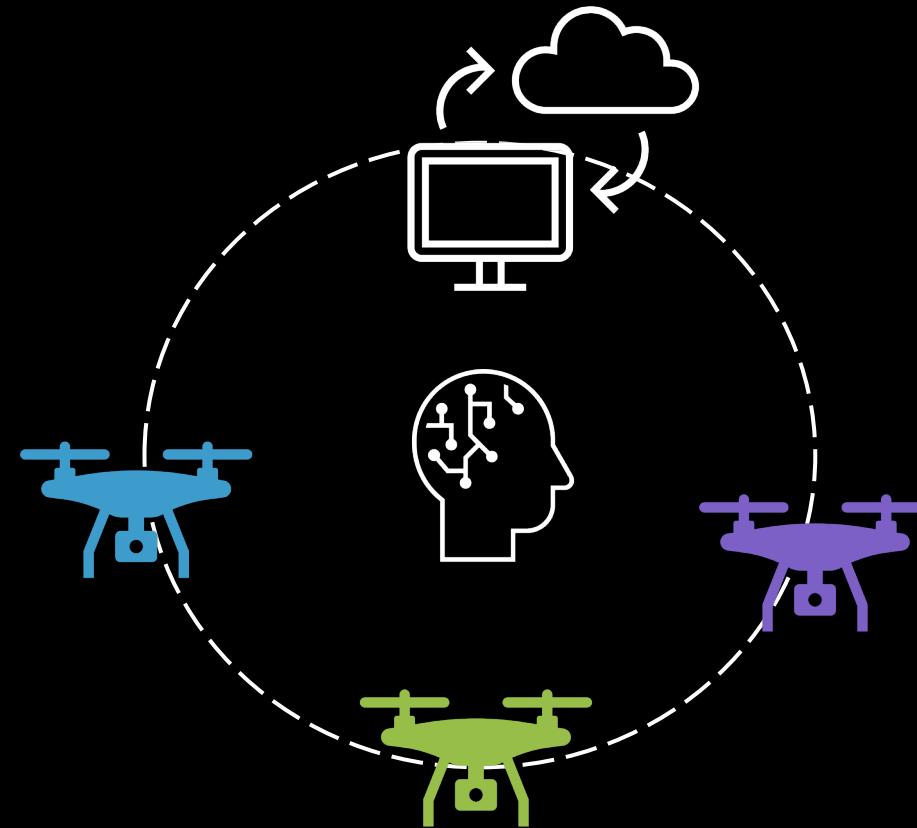






Resilient Edge Architecture for Autonomous UAVs

- Autonomous Swarms
- Edge Networks
- AI for Edge



Resources

ICICLE Institute <https://icicle.osu.edu/>

Imageomics Institute <https://imageomics.osu.edu/>

OSU Airport <https://osuairport.org/community/unmanned-aircraft-systems-drones>

Ohio Air Mobility Symposium (March 29-30) <https://u.osu.edu/ohiouamsymposium/>

Contact Information

Jenna Kline

kline.377@osu.edu



Questions?

Thank you!

