In-situ utility of Unmanned Aerial Vehicles (drones) for geologic field work

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THE TEAM

We are an interdisciplinary group of **geoscientists**, **cognitive scientists**, and **robotics engineers** investigating how Unmanned Aerial Vehicles (UAVs or drones) can be used to support the daily workflow of field geoscientists.
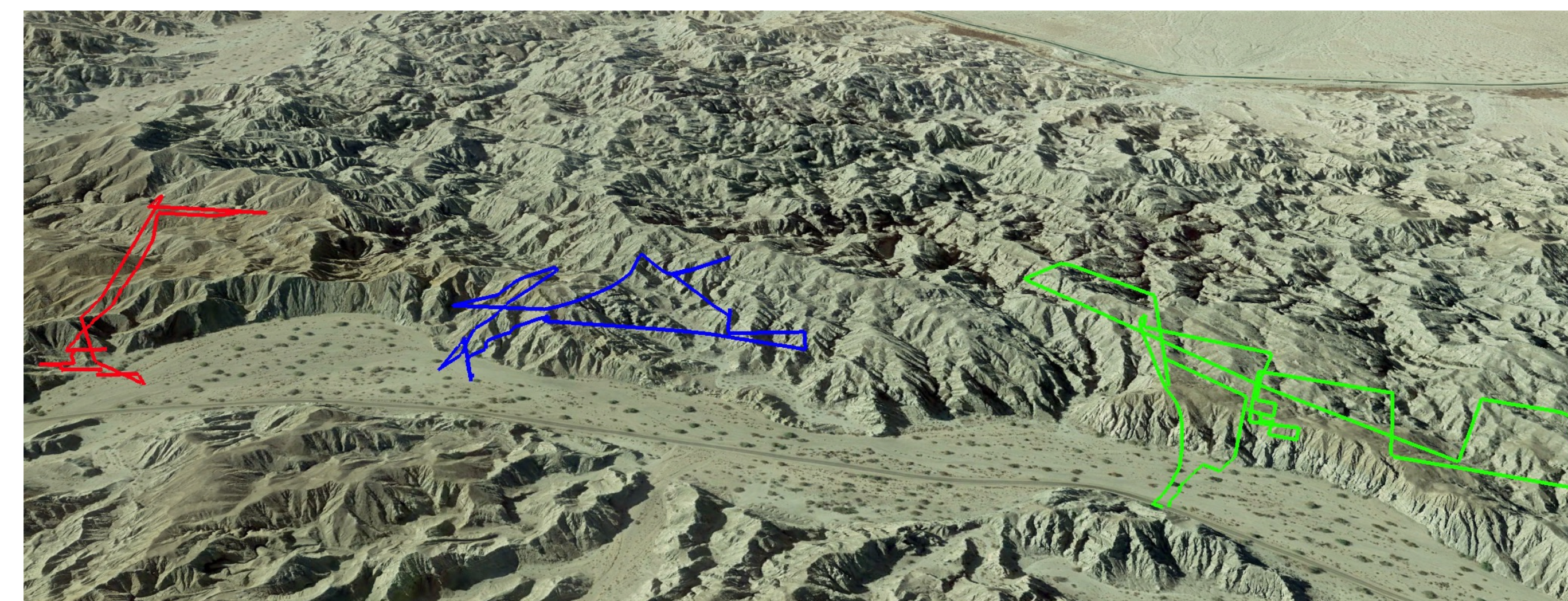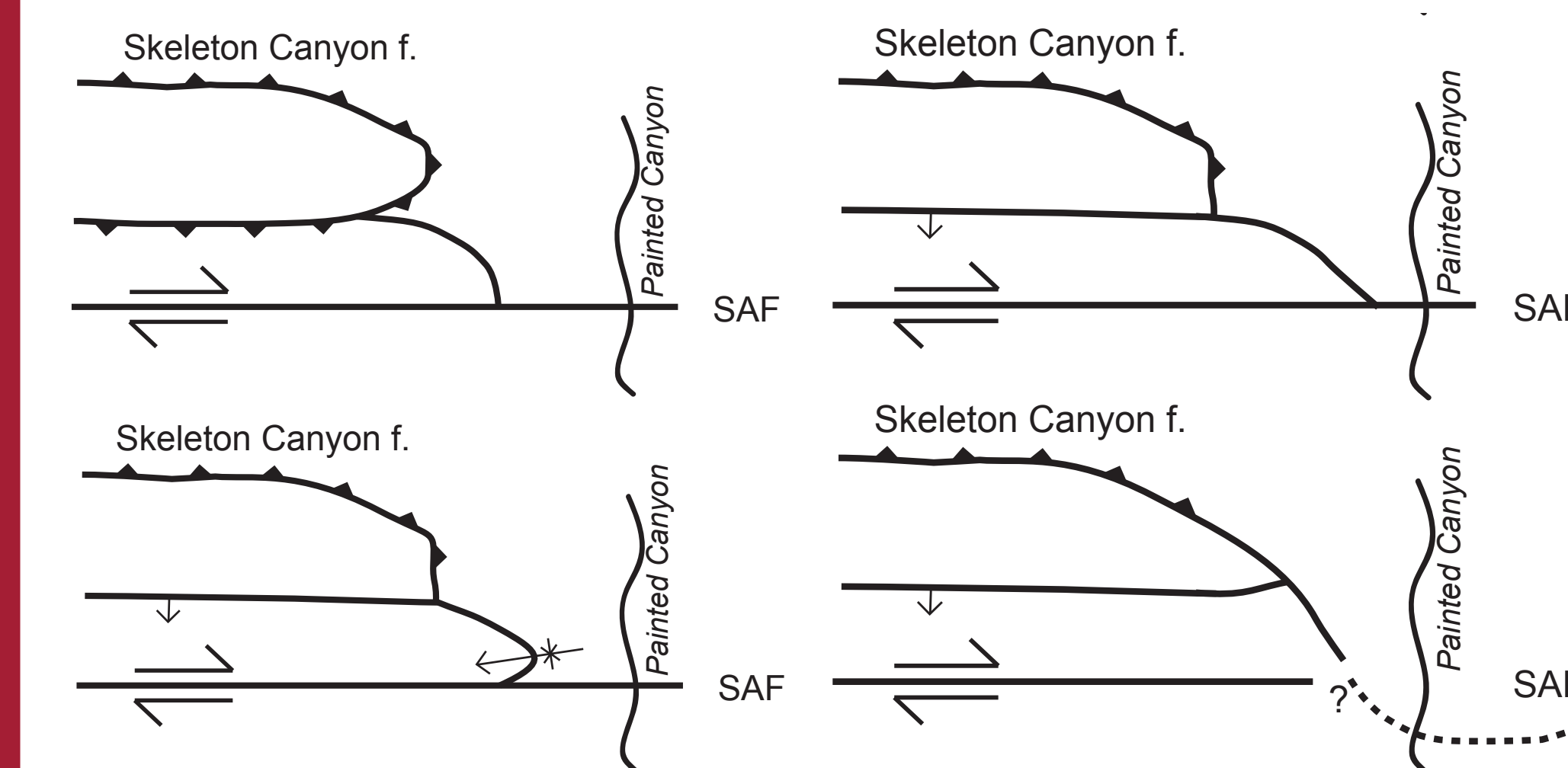
THE CASE STUDIES

To determine how UAVs can aid geologic interpretation and decision making in-situ, we had experts use commercial UAVs during a field campaign in the Mecca Hills in Southern California.

Case Study 2. Explore regions of interest.

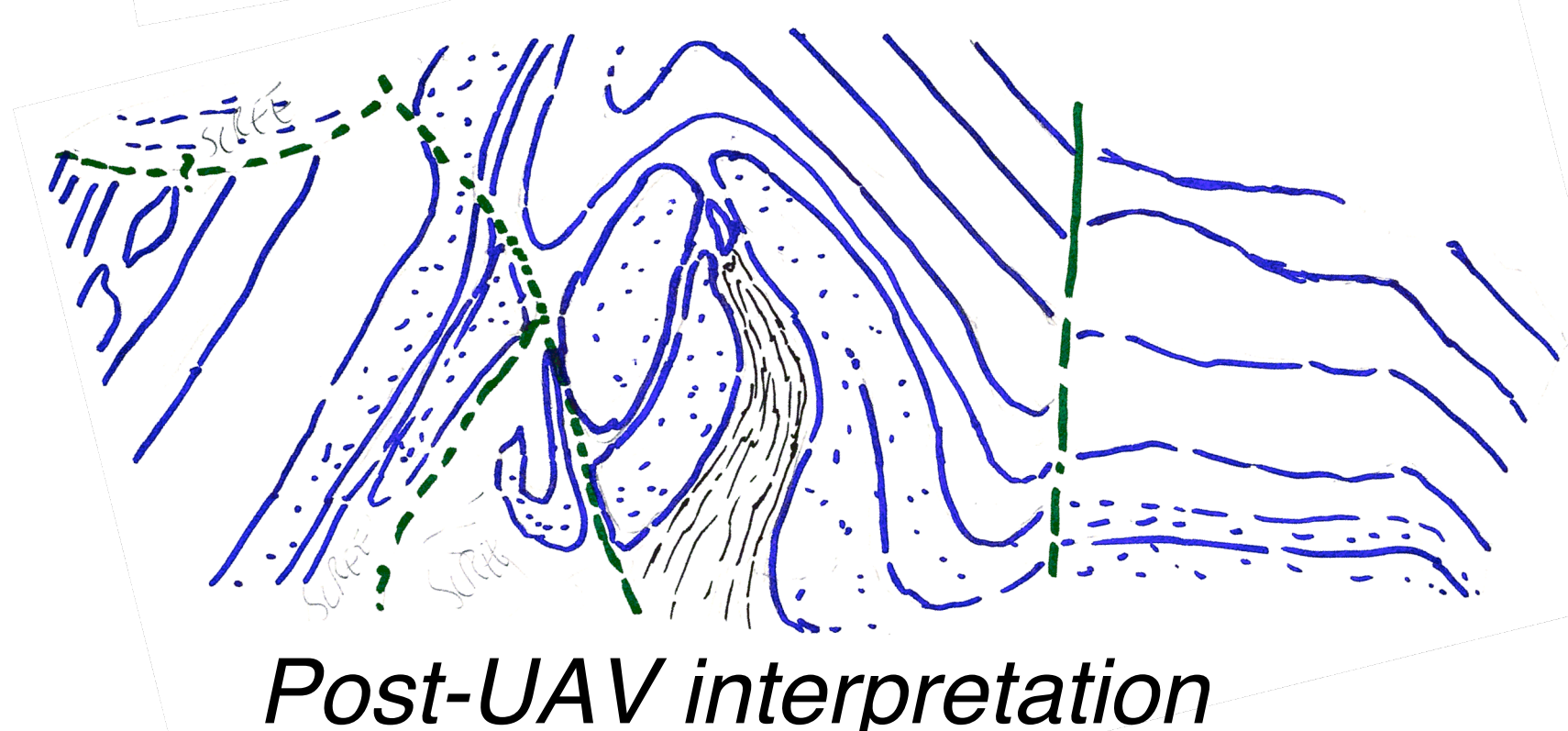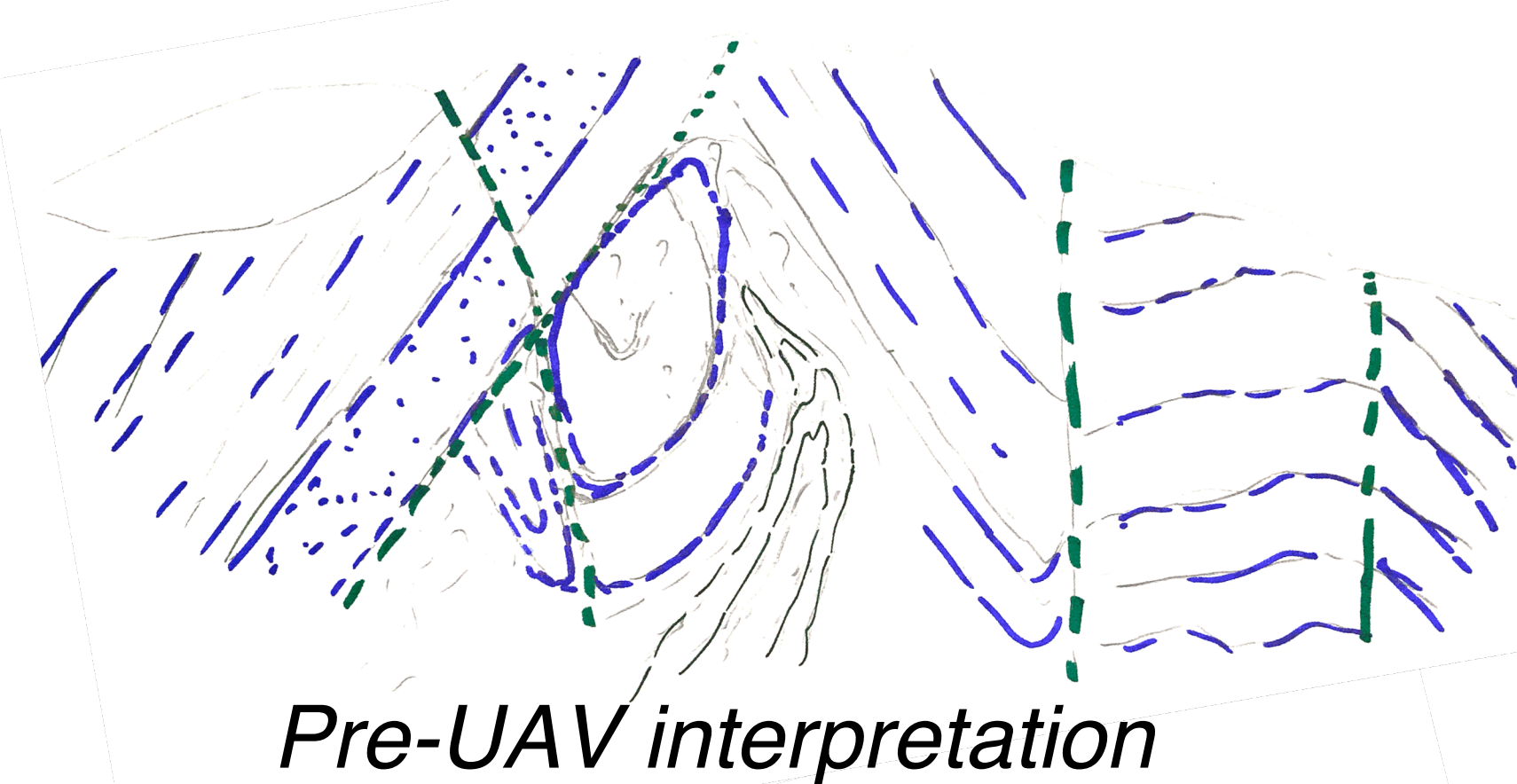- T-flight ● (red)
- Zig-zag flight ● (blue)
- Recon flight ● (green)

Case Study 3. Evaluate competing models.

SCF
SAF

Case Study 1. Interpret large-scale vertical outcrop.

Pre-UAV interpretation

Post-UAV interpretation

- Bedding ● (blue)
- Fault ● (green)
- Clays ● (grey)

THE TAKEAWAYS

In-situ UAV imagery aided geologic interpretation and decision making by allowing experts to more **quickly** and **flexibly** move between visual scales (narrow, wide) and observational method (data-driven, model-driven).

However, this increased speed and flexibility presented **new challenges**:

- Where is the UAV in space?
- Where is the UAV "looking"?
- Feeling overwhelmed by what the UAV "sees"