

# MultiFlyCam

## Dense 3D Reconstruction of Dynamic Actors in Natural Environments using Multiple Flying Cameras

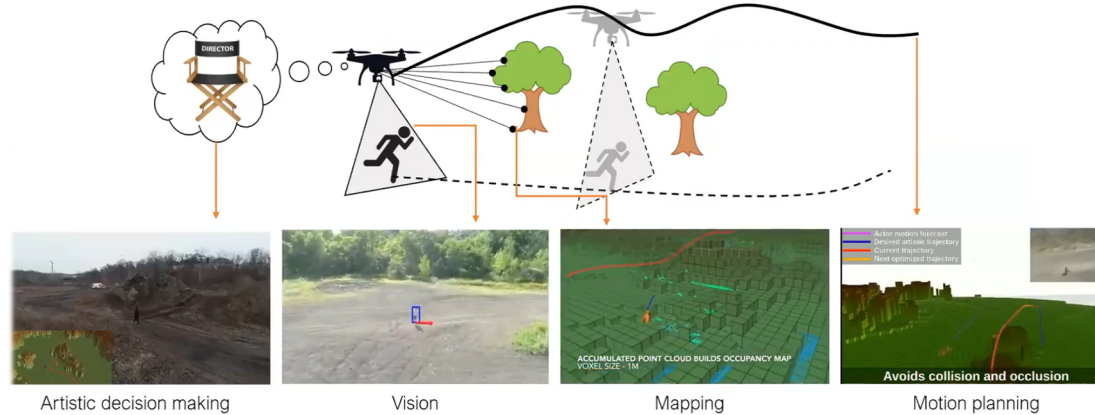
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[1: The Robotics Institute, Carnegie Mellon University; 2: Department of Computer Science, University of Minnesota]

**Core idea:** Use team of UAVs to rapidly reconstruct dense 3D models and motion

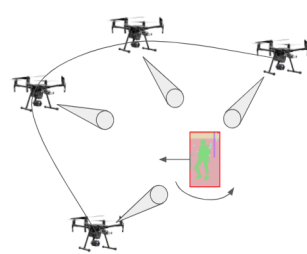
Key problems to be addressed:

1. Target forecasting and state estimation
2. Multi-UAV, multi-objective motion planning
3. Safe reactive control
4. 3D Spatiotemporal reconstruction

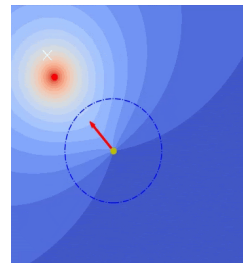


Use a single drone to maintain frontal or complete coverage of a mobile actor.

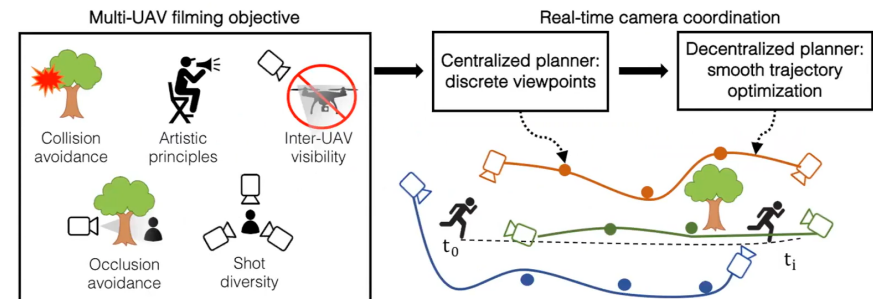
We will initially start with the case where a single actor's motion is confined to a small area. Next, we will address the general case of multiple actors moving in 3D space



2D space planning given a single actor and view metric



2D planning problem demo

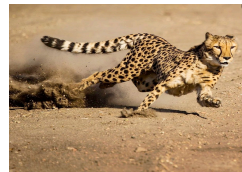


### Impact



#### Biomechanics

Accurate and actionable biomechanical data



#### Animal Studies

Large-scale tool for understanding group behaviors



#### Entertainment/Cultural

Preservation/VR – infinite views of unscripted scenes



Robotics/AI – massive high-quality data for learning-based models

**Goal:** High accuracy 3D reconstructions, captured autonomously from the sky with multiple cameras