

Sensor-Driven Path Planning for Unmanned Aerial Vehicles

Or "Planning by Looking"

MQ-9 Reaper



~\$30.3 million each

Unicorn Airframe, Kestrel Autopilot



A few thousand \$

Parrot AR.Drone



~\$300

UAVs are getting...

Cheaper

More Powerful

Regulated

UAV Applications

Surveillance

Reconnaissance

Signals Intelligence

Aerial Cinematography

Precision Agriculture

Ortho-Imagery

Research

UAV Sensors

Cameras

Radiation Detectors

Laser Range Finders

Chemical Detectors

Antennas

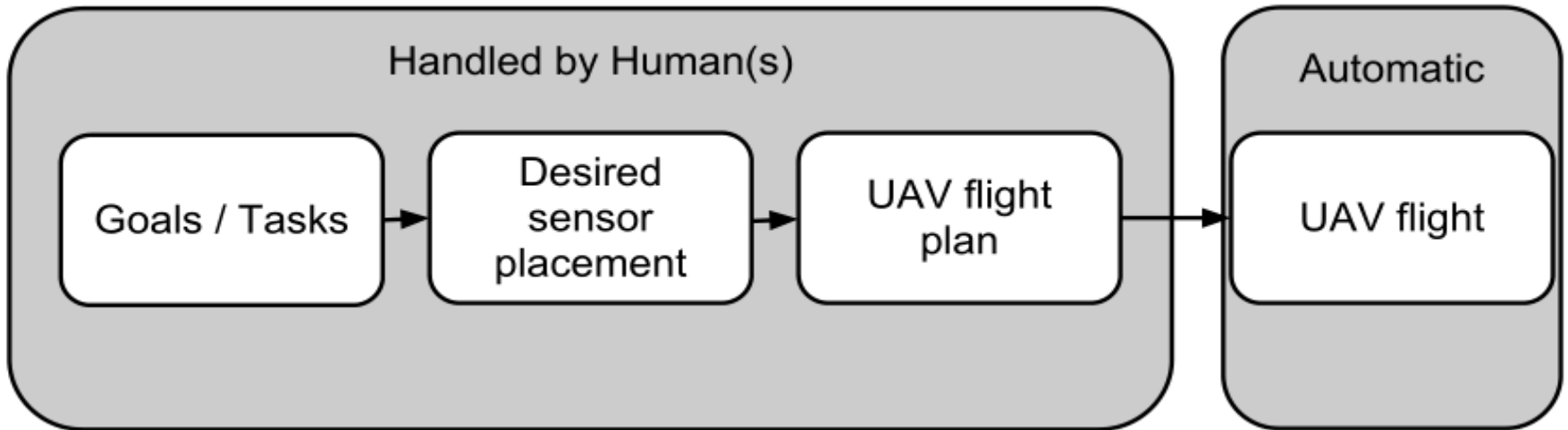
Piloting is Hard

This is where a video of first-person piloting would go

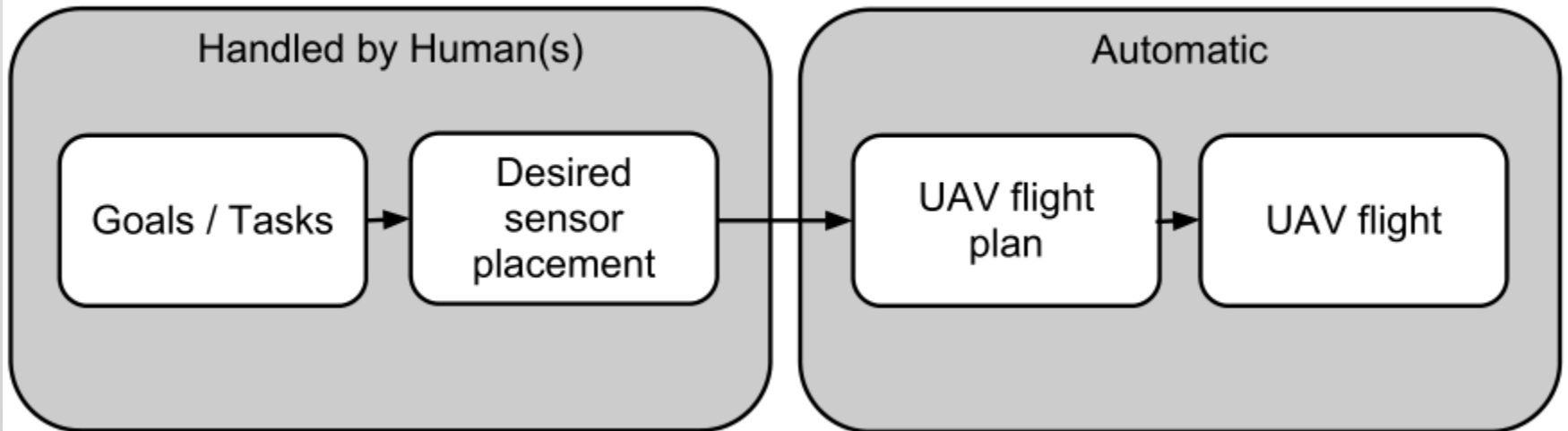
Waypoint Planning is Hard, Too!

This is where a video from the plane as it is flown remotely by waypoint should go. We were searching for red umbrellas in the video

Current State of Affairs



Desired State of Affairs



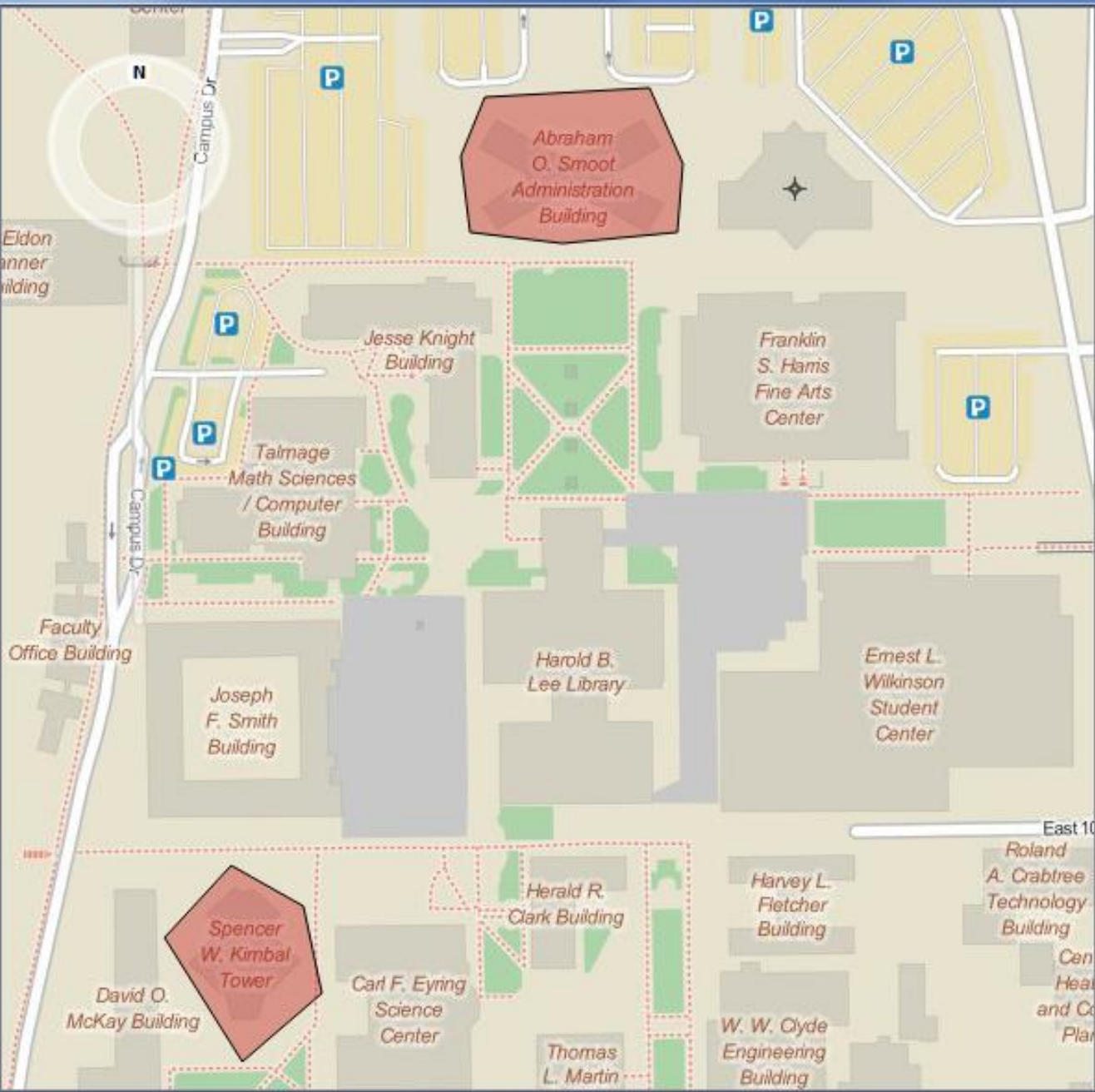
Our Proposal: Sensor-Driven Planning

What?

Where?

With what?

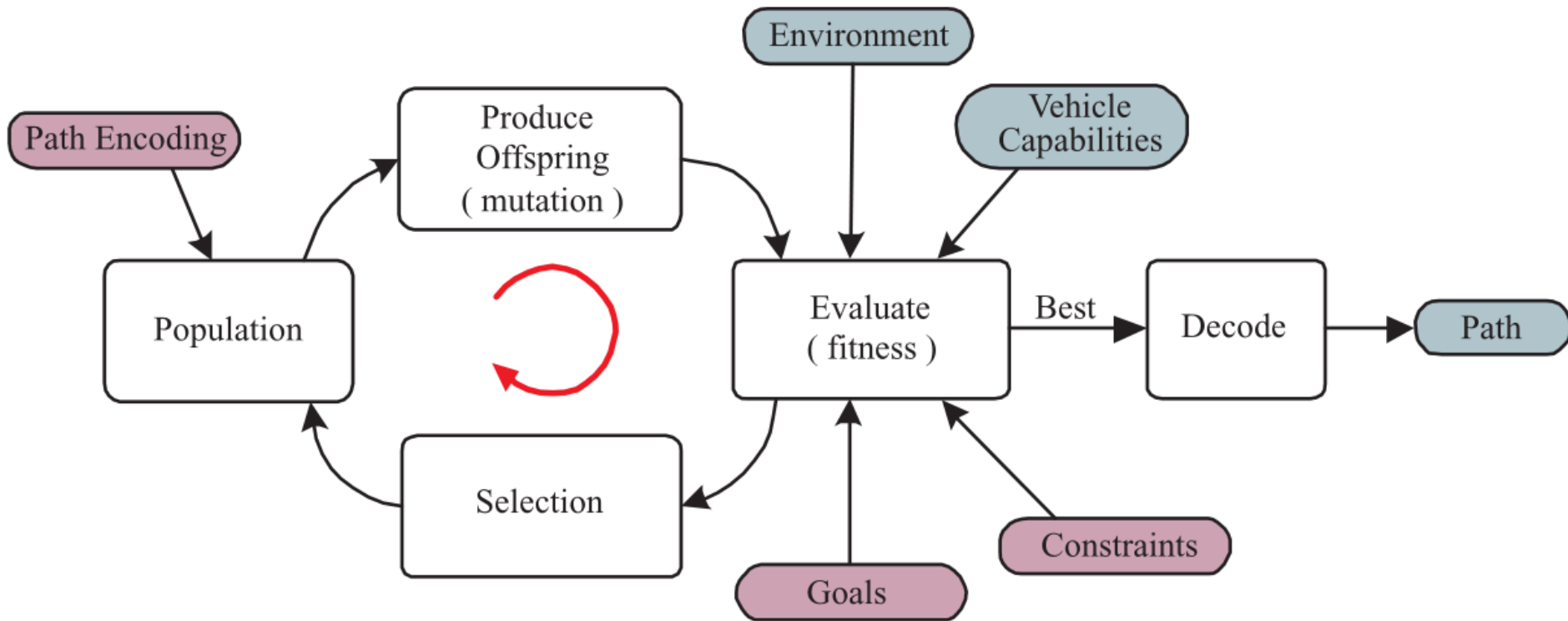
When?



Selection Tool	No-Fly Zone	Sweep Zone
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Path Planner

Evolutionary Algorithms!



Conclusion

Current UAV piloting/planning methods are hard.

Users just want to sense some things.

Why not let them express those desires and then have the system plan a path that satisfies them?