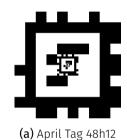


Autonomous Drone Landing with Fiducial Markers and a Gimbal-Mounted Camera for Active Tracking

Joshua Springer 25 November 2022

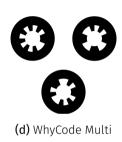
Reykjavik University Department of Computer Science

Fiducial Markers











The Downward-facing Camera Axiom



Orientation Ambiguity



Testing Platform: DJI Spark

DJI Mobile SDK



Testing Platform Limitations/Workarounds



Example Tracking Performance



Example Landing Trajectory



Example Control Outputs



Erroneous Control Outputs



Erroneous Landing Trajectory



Landing Radii



Future Work



► Actuated, gimbal-mounted camera



lacktriangle Actuated, gimbal-mounted camera ightarrow easier to search for the landing pad.



- ightharpoonup Actuated, gimbal-mounted camera ightharpoonup easier to search for the landing pad.
- ► Orientation ambiguity, discontinuities



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- ightharpoonup Orientation ambiguity, discontinuities ightharpoonup pose estimation is harder.



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- ► Autonomous precision landing still possible



- ightharpoonup Actuated, gimbal-mounted camera ightharpoonup easier to search for the landing pad.
- ightharpoonup Orientation ambiguity, discontinuities ightharpoonup pose estimation is harder.
- ► Autonomous precision landing still possible but can be improved.

