XPOSE: Reinventing User Interface with Flying Camera

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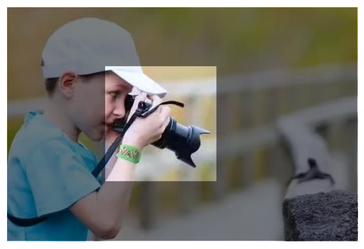
Motivation

An easy-to-use UI for flying camera photography

- Evolution of Device



Handheld Camera

Flying Camera

- Evolution of Interface

Drone Control

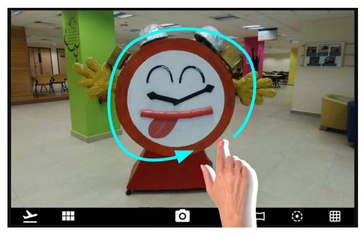
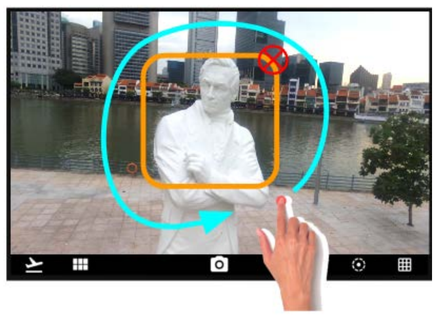


Image Manipulation

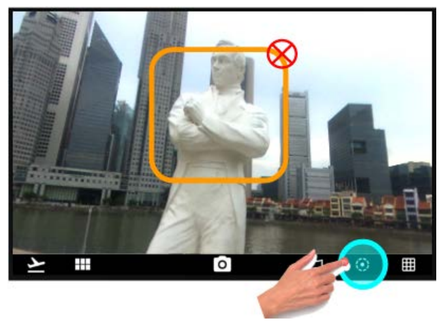
EXPLORE-and-COMPOSE

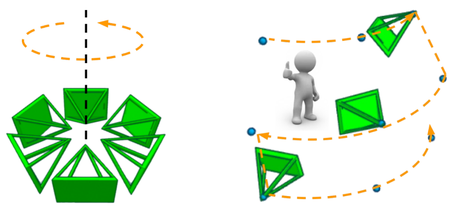
EXPLORE

- Object of Interest Selection



- POV Sampling



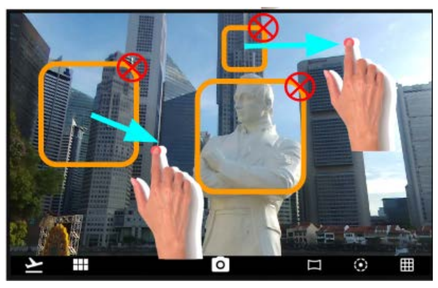


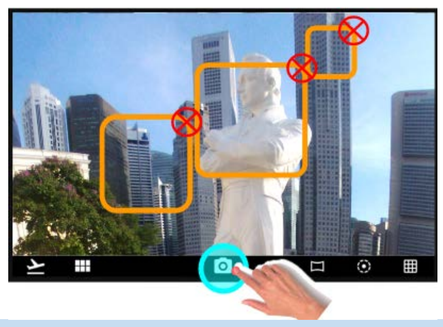
Exploration Modes

COMPOSE

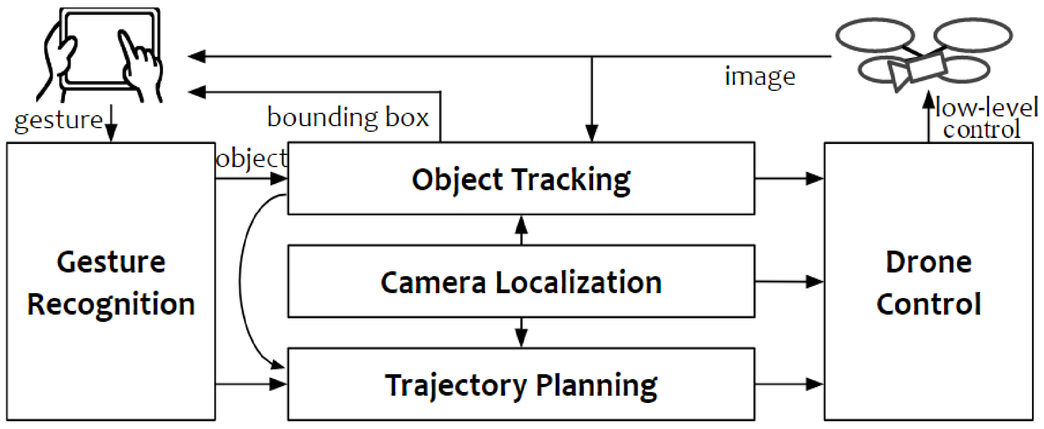
- POV Restore

- Direct View Manipulation





System Architecture



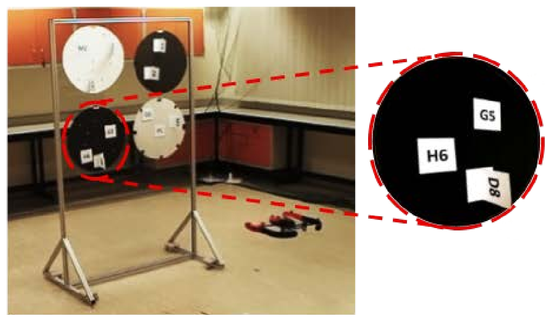
- ORB-SLAM is exploited for camera localization and object tracking

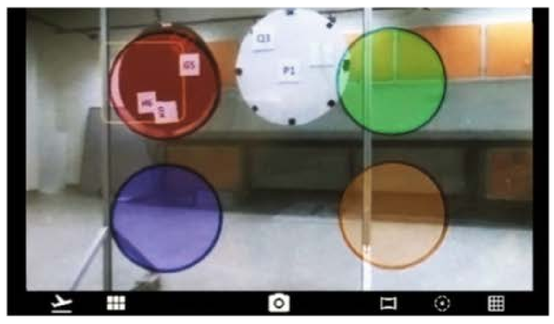
System Components	Explore		Compose	
	Object of Interest Selection	*POV Sampling*	*POV Restore*	*Direct View Manipulation*
Gesture Recognition	✓			✓
Camera Localization		✓		✓
Object Tracking	✓	✓*		✓*
Trajectory Planning		✓	✓	✓
Drone Control	✓	✓	✓	✓

- **✓*** indicates that an object of interest is required

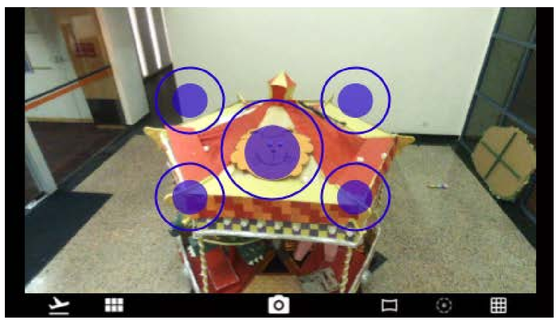
XPOSE vs Joystick

- Interaction Design Evaluation Setup

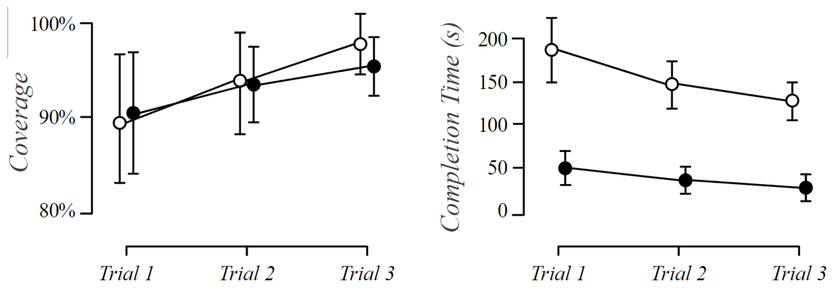




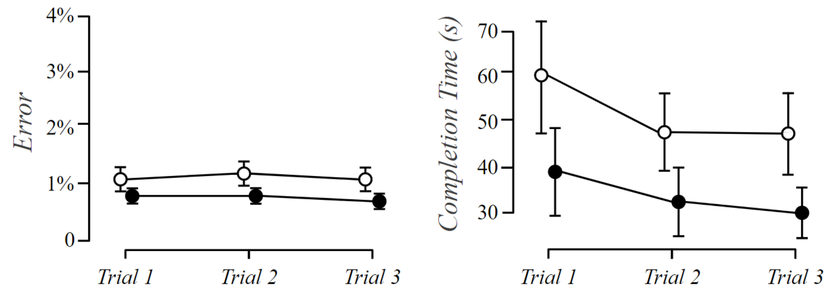
- Overall System Performance Evaluation Setup



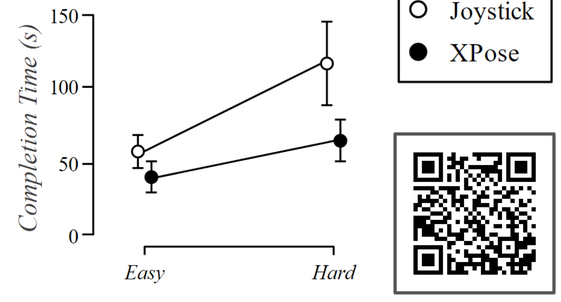
- Exploration Task



- Composition Task



- Photo-taking Task



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