Wildfire Detection Drone

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Problem

- In California 150k acres of land burn annually; the effects of global warming will only exacerbate this.
- The cost of damages in 2018 alone is a staggering $400 billion.
- Wildfires can be better suppressed if they have just started; they exponentially develop into larger fires that can become hard to contain.

2018 Camp Fire in Butte County

Current Technologies

Fire Spotting Plane

Butte County Lookout. Smoke and fire detection cameras.

- Helicopter and airplane patrols are able to survey remote areas, however each flight costs over $4,000
- Fire lookout towers with automated camera systems incur low upkeep cost, yet they're immobile
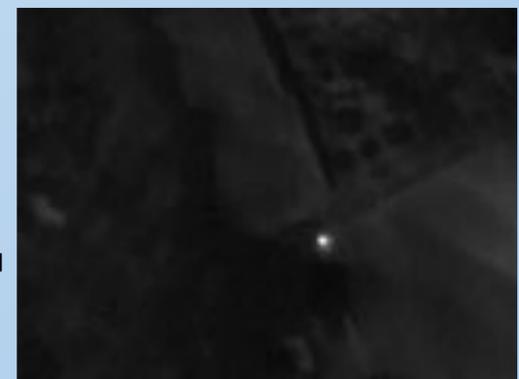- Satellites scan massive areas, however they are not useful for early detection

Our Solution

- High resolution IR imaging from a low altitude allows for the early detection of small fires (5'x5') while RGB is useful for verification by an operator
- Autonomous flight leaves no room for human error, the exact region of interest is patrolled, and the collection of data is consistent for every flight

Our development drone with fire detection payload

IR image of a 5'x5' charcoal fire hovering at 350' Above Ground Level (AGL)

Key Benefits of Our Design

Cost:	Automation:	Accessibility:
- The cost of a new system is under $5,000 and each flight is the price of charging a battery - A modular system means that maintenance is simply the replacement of broken parts - Early detection of smaller fires leads to lower suppresion costs and less destruction	- Hands free operation frees up first responders for other duties - Because an operator is unnecessary, beyond line of sight operation is possible - A competent flight algorithm reduces probability of complications such as crashing	- Low learning curve allows firefighters to properly deploy the drone with minimal training - Can independently deploy the drone - Easy transportation of the drone allows surveillance of any area near a road