Wildfire Detection Drone
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Majors: CSE ECE RE BME

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.

Current Technologies

● 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

Key Benefits of Our Design

<table>
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<tr>
<th>Cost:</th>
<th>Automation:</th>
<th>Accessibility:</th>
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<td>● The cost of a new system is under $5,000 and each flight is the price of charging a battery</td>
<td>● Hands free operation frees up first responders for other duties</td>
<td>● Low learning curve allows firefighters to properly deploy the drone with minimal training</td>
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<td>● A modular system means that maintenance is simply the replacement of broken parts</td>
<td>● Because an operator is unnecessary, beyond line of sight operation is possible</td>
<td>● Can independently deploy the drone</td>
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<td>● Early detection of smaller fires leads to lower suppression costs and less destruction</td>
<td>● A competent flight algorithm reduces probability of complications such as crashing</td>
<td>● Easy transportation of the drone allows surveillance of any area near a road</td>
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2018 Camp Fire in Butte County