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FLETS

Fire, Locational, Environmental, Topographical Satellite

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Background Situation

My Background

I have been an emergency responder for over ten years and have been involved in medical, fire, and rescue emergencies. I am passionate about helping people by incorporating new technologies as part of the emergency response to identify hazards to the responders and reduce the time it takes for recovery.

Australian Condition and Recent Event
2019/ 2020 Fire Season

The months-long wildfires raging in Australia have killed at least 26 people, and smoke from the fires was responsible for 450 deaths

More than 3,000 houses have been destroyed.

Millions — possibly 1 billion — animals have died.

QFES deployed more than 600 personnel to assist in the firefighting efforts in NSW, Victoria, and the ACT.

Image Credits:
1. The fast-moving fire is threatening properties.(Supplied: NSW Rural Fire Service)
2. Lightning created by fire storm cloud
3. Koala seen in rescue from Australian bushfire dies (2019) https://www.bbc.com/news/world-australia-50553859
4. Queensland Rural Volunteer Firefighters assisting in the 2020 New South Wales Fire. Supplied: T.Cuff

Future Outlook

The sad reality is bushfire incidents are increasing in intensity and the social and financial costs are spiralling out of control." "A 2016 Climate Council report stated that bushfires currently cost the NSW region around $100 million dollars each year and this is forecast to rise to $800 million by 2050."

Purpose

We are motivated by the recent bushfire event to find a method/system to acquire reliable real–time data to:

- Enhance the safety of the first responders during bushfire events;
- Identify access points to coordinate rescue efforts.

Background

As we can see from the bushfires event in 2020, these circumstances have caused death, severe damage to properties and wildlife and seriously impacted the Australian economy. Australia's dry and hot weather conditions combined with strong wind fuelled the fires to spread rapidly.

Challenges

In facing this harsh condition, the firefighters are faced with a series of challenges on the fire ground, such as:

1. Delays in receiving information on the fire ground;
2. Poor or no radio communication;
3. Sudden changes in the wind direction;
4. Delay in receiving immediate mapping information;
5. Unable to obtain information about the terrain situation;
6. Human factors – i.e. errors in relation to directions and knowledge; and
7. Manned aircraft are costly and restricted due to flight time restraints and fuel loads.

The current source of data

- Fixed wing manned aircraft for mapping
- Satellite data for reliable information
- Crew information and knowledge
- Poor radio communications
- GPS
- T cards
- Watchtowers

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By combining several operating systems, such as the latest technology, satellite imagery, and data from an Unmanned Aerial System (UAS), we hope to provide more reliable real-time data (such as weather and wind direction) to be transmitted to handheld devices/tablets.
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Current Collaboration

Over the last two years, two QUT Professors and one QUT PhD student have been working collaboratively on an AI algorithm for search and rescue drones. The goal is to use the drone to autonomously search for natural disaster victims to speed up the rescue process. Practical testing has been conducted, and they are now integrating each of the required subsystems and components for autonomous drone targeting detection.

The Need

TAC Resources collaborates with the Queensland University of Technology to develop artificial intelligence and processes for the UAS. We welcome collaboration with other organisations in the areas, such as satellite imagery, mobile application, and others, who have the same vision of improving the chance of saving more lives.