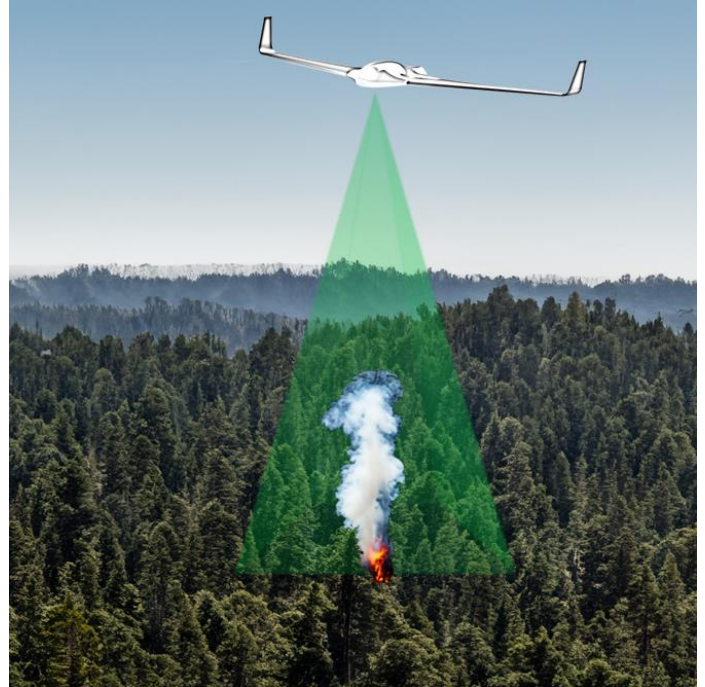


Jumping and in-flight-stabilization of a Jumping Quadrupe^d in Mars Gravity Using Reinforcement Learning

Abstract: This project aims to develop a sensing payload that enables the detection and localization of a wildfire virtually as soon as it is ignited, meaning at a very early stage of its evolution. This in turn shall allow rapid response to such potentially catastrophic events. The focus is both on the hardware development of the sensing load - which should be integrated on a small fixed-wing unmanned aerial vehicle - as well as on the robot perception and fusion algorithms for detection and localization from heights.

Tasks:

- Study and understand methods for fire detection through diverse sensing signatures.
- Study and understand geometric methods for localizing the fire on inertial coordinates.
- Develop sensing payload for fire detection and localization.
- Develop algorithms – and their software implementation – for vision based fire detection and localization from heights.
- Consider method extension to longwave infrared signatures.
- Integrate the sensing payload on one of our unmanned aerial vehicles in-flight-stabilization.
- Flight testing for data collection and method verification.



Literature (indicative):

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Project relevance: XPRIZE Wildfire Challenge