The VolCAN Swarm

NRI: INT: Adaptive Bio-inspired Co-Robot algorithms for volcano monitoring NRI/NSF #2024520 to UNM, OCT 2020

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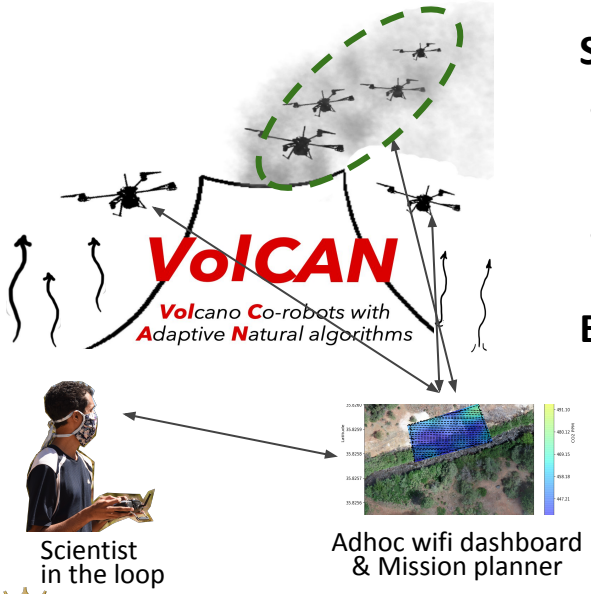
Challenge

Measure volcanic gases to predict eruptions & inform climate models

- Identify largest plumes fast
- Detect invisible plume clusters
- Estimate plume volume
- Find maximum CO_2 source

Solution

- Bio-inspired algorithms & theoretical analysis emphasize speed & robustness in dynamic, challenging environments
- TEST in simulations, outdoors, volcanoes



Scientific Impact

- Advance understanding of autonomous adaptive co-robot algorithms & scientist in-the-loop environmental sensing
- Field test UAV swarms in harsh environments

Broader Impact

- Help geologists predict volcanic eruptions with potential to save thousands of lives; previously impossible at most of Earth's 1500 active volcanoes.
- Swarmathon TNG workshops will engage underrepresented students in robotics research

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