Thermal-Aware Drone Battery Management

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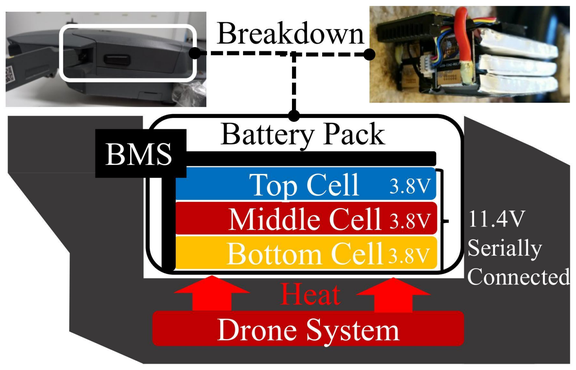
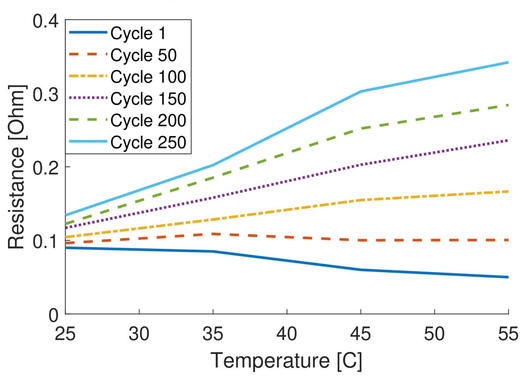
1. Motivation: Unexpected Drone Shutoffs

Users have reported that their drones unexpectedly shutoff even when they show more than 10% remaining battery capacity.
The research objective is to know why unexpected shutoff happens at drones and make solutions without additional equipment.

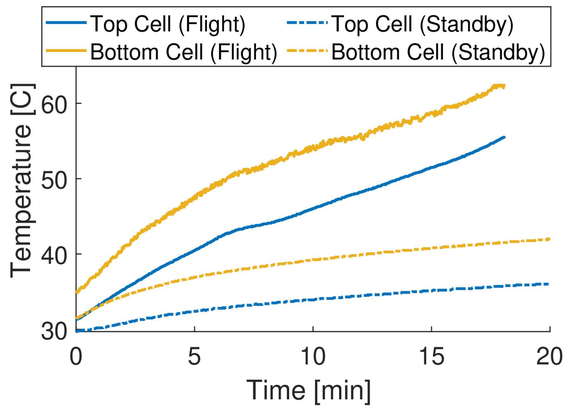
2. Cause: Cell Temperature Imbalance



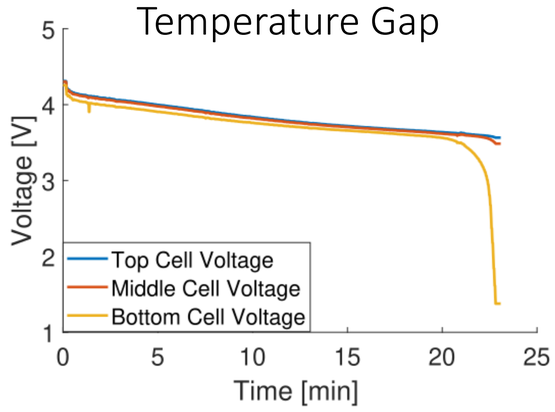
Target Drone System



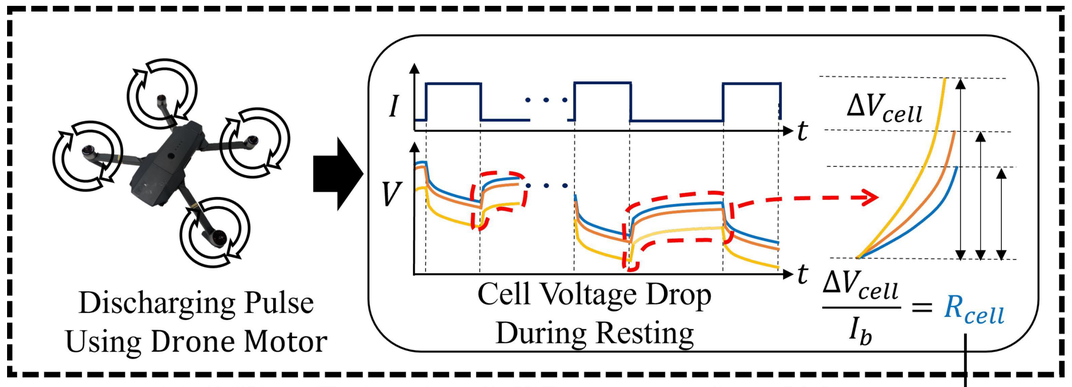
Resistance Increase



Temperature Gap



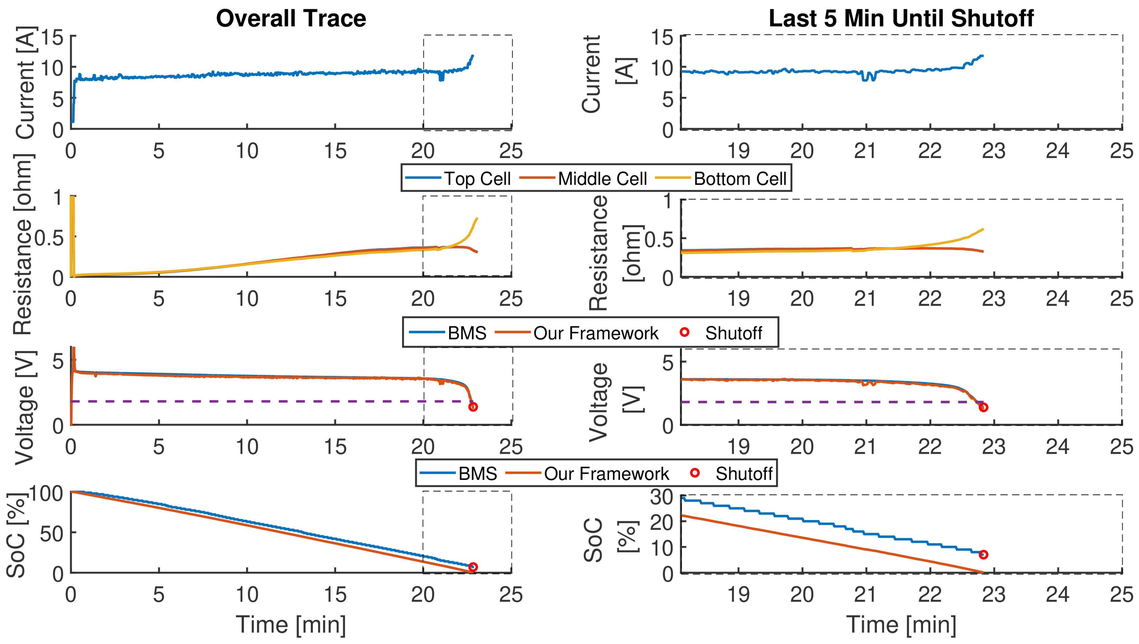
Cell Voltage Drop



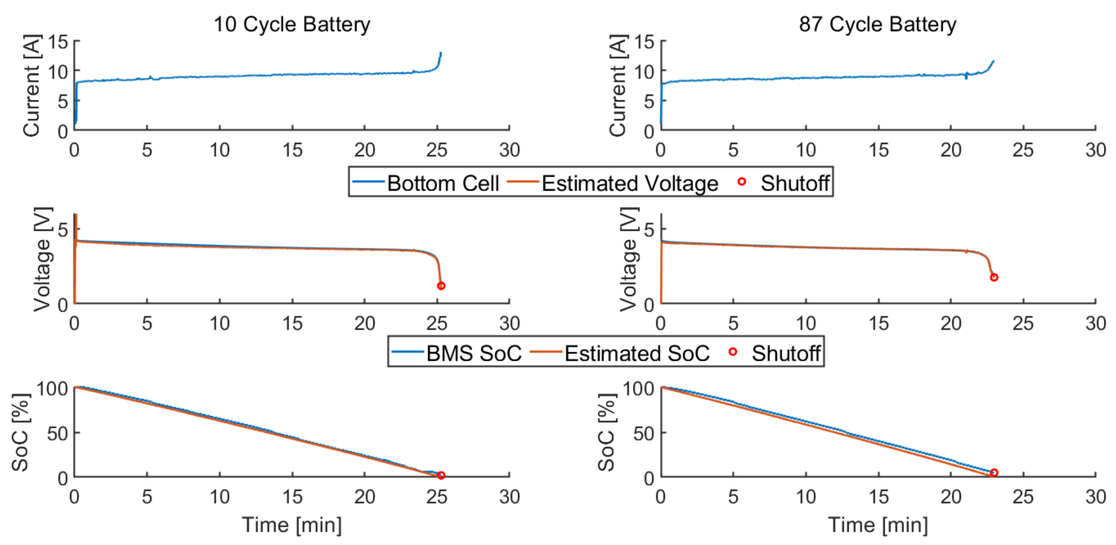
Thermal-Aware Drone Battery Management Overview

3. Experiment: Capturing Cell Thermal Degradation

Current, resistance, voltage, SoC comparison with and without our framework using 64 cycles battery



Drone battery management on batteries with different battery cycles (10 vs 87 cycles)



Acknowledgement

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