Developing a low-cost drone detection system

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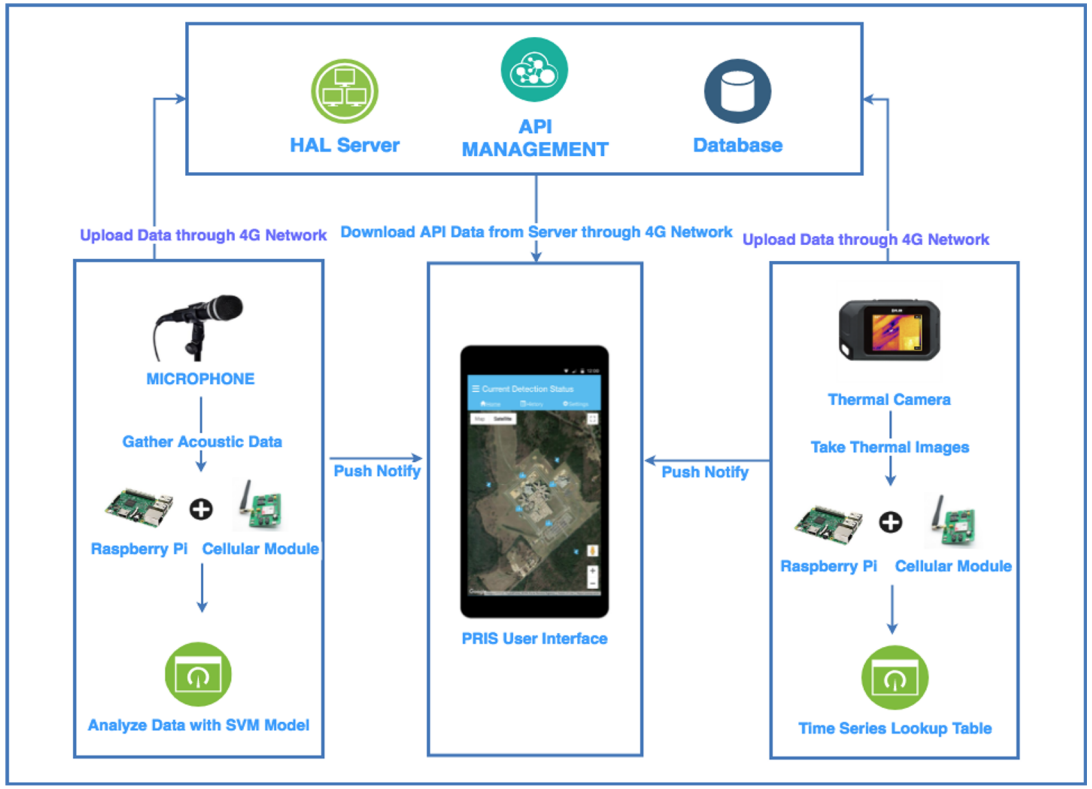
In collaboration with Clemson University

Drones are everywhere

Cost is a major consideration

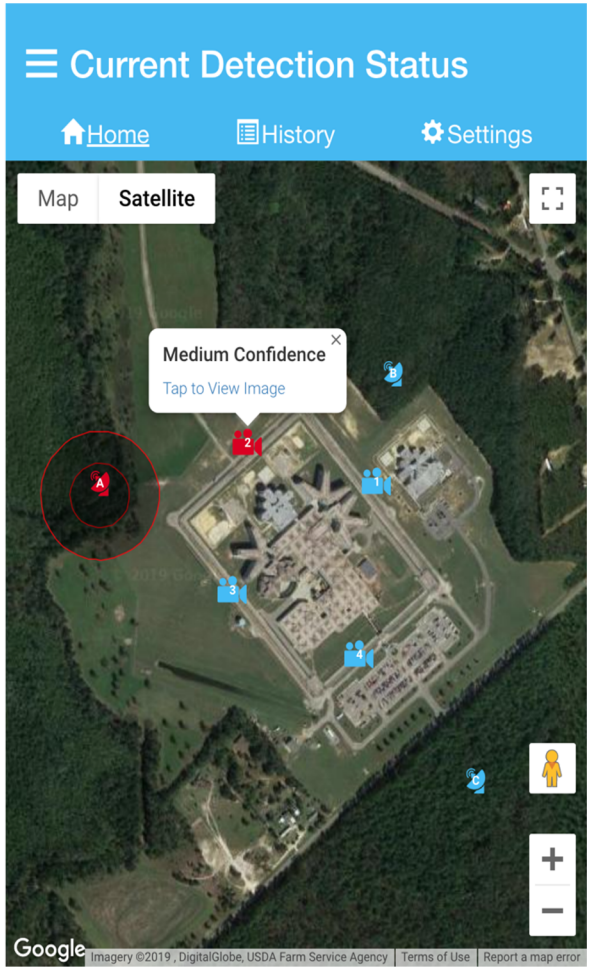
Mobile Acoustic Warning System (MAWS)

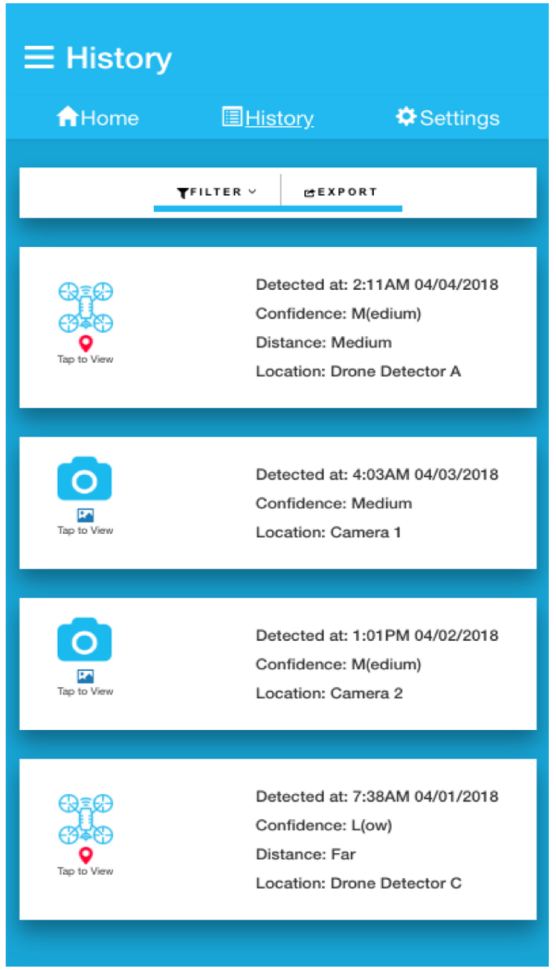


Mobile Alerting Interface

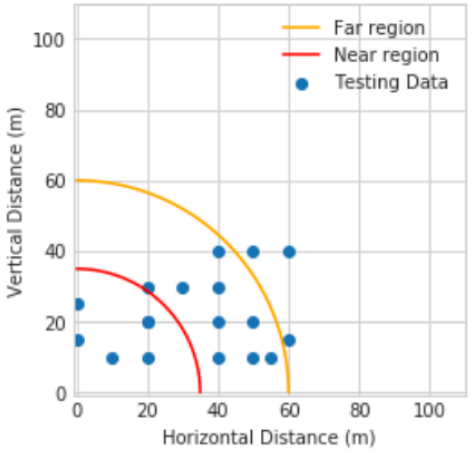
- Map & history
- Uses a 30s queue of alerts to push very near to midrange alerts

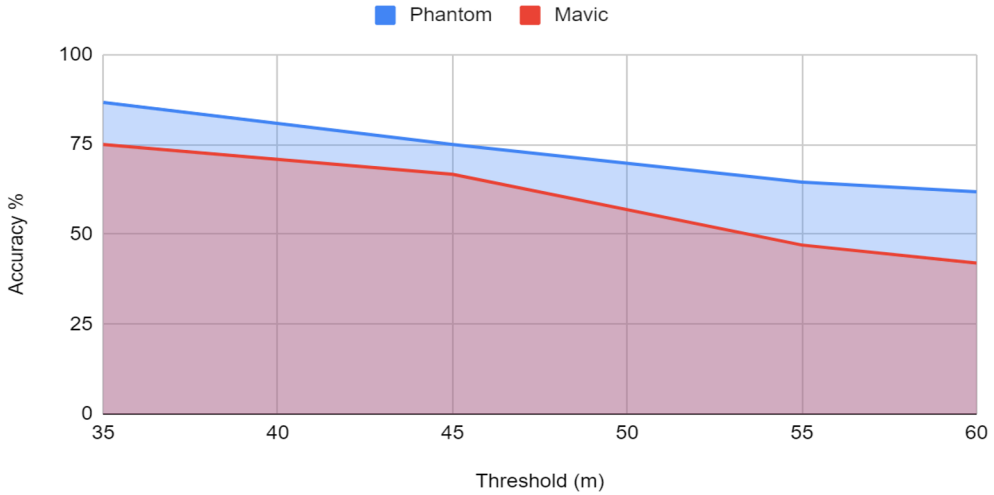
‘Very Near’: < 15 m
‘Near’: 15 - 35 m
‘Midrange’: 35 - 60 m
‘Far’: 60 - 120 m
‘Very Far’: > 120 m

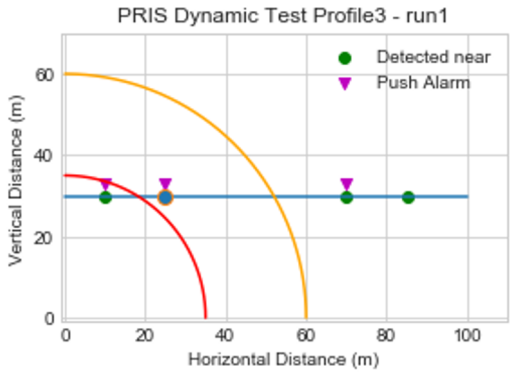


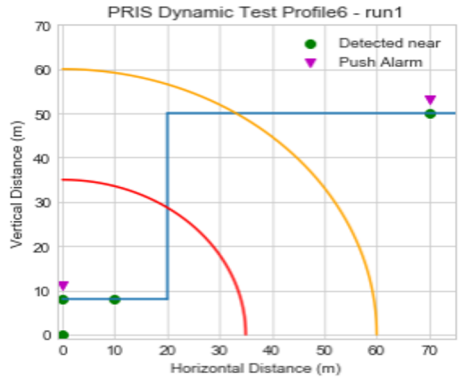


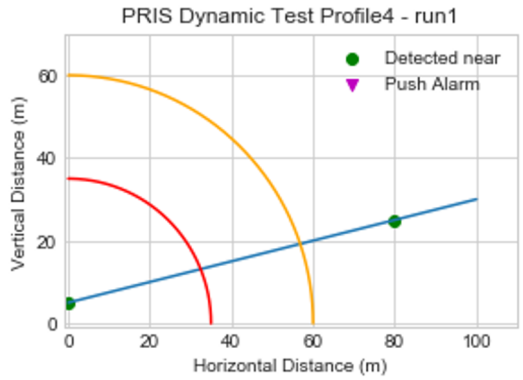
Field Tests


Far region
Near region
Testing Data
Vertical Distance (m)
Horizontal Distance (m)
0
20
40
60
80
100


Phantom
Mavic
Accuracy %
Threshold (m)
0
25
50
75
100
35
40
45
50
55
60


PRIS Dynamic Test Profile3 - run1
Detected near
Push Alarm
Vertical Distance (m)
Horizontal Distance (m)


PRIS Dynamic Test Profile6 - run1
Detected near
Push Alarm
Vertical Distance (m)
Horizontal Distance (m)


PRIS Dynamic Test Profile4 - run1
Detected near
Push Alarm
Vertical Distance (m)
Horizontal Distance (m)

Future Work

- Updating the training data to include lawn equipment
  - https://sites.duke.edu/prisdatabase/
- Adding in a low cost RF detector
- Developing a new convolutional neural net approach
- Developing a collaboration with users for contextualizing data
- Design recommendations for public space managers