Active Projects

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Current Project in a Flash

Active

- Marine-life detection (acoustic data)
- **BlackBirds Detection & Monitoring (imagery, acoustic, and thermal data)**
- Autonomous BotanicBot Operation (imagery + time series data)
- Mobile Cyber Security Threat Adaptable Detection (time series data)

Starting

- Nuclear Reactors Heat Exchange Optimization (time series data + physics conditions: Physics Informed ML)
- NeuroEvolution and Neural Architecture Search in Quantum Computing

Detecting Moving & Camouflaging Birds

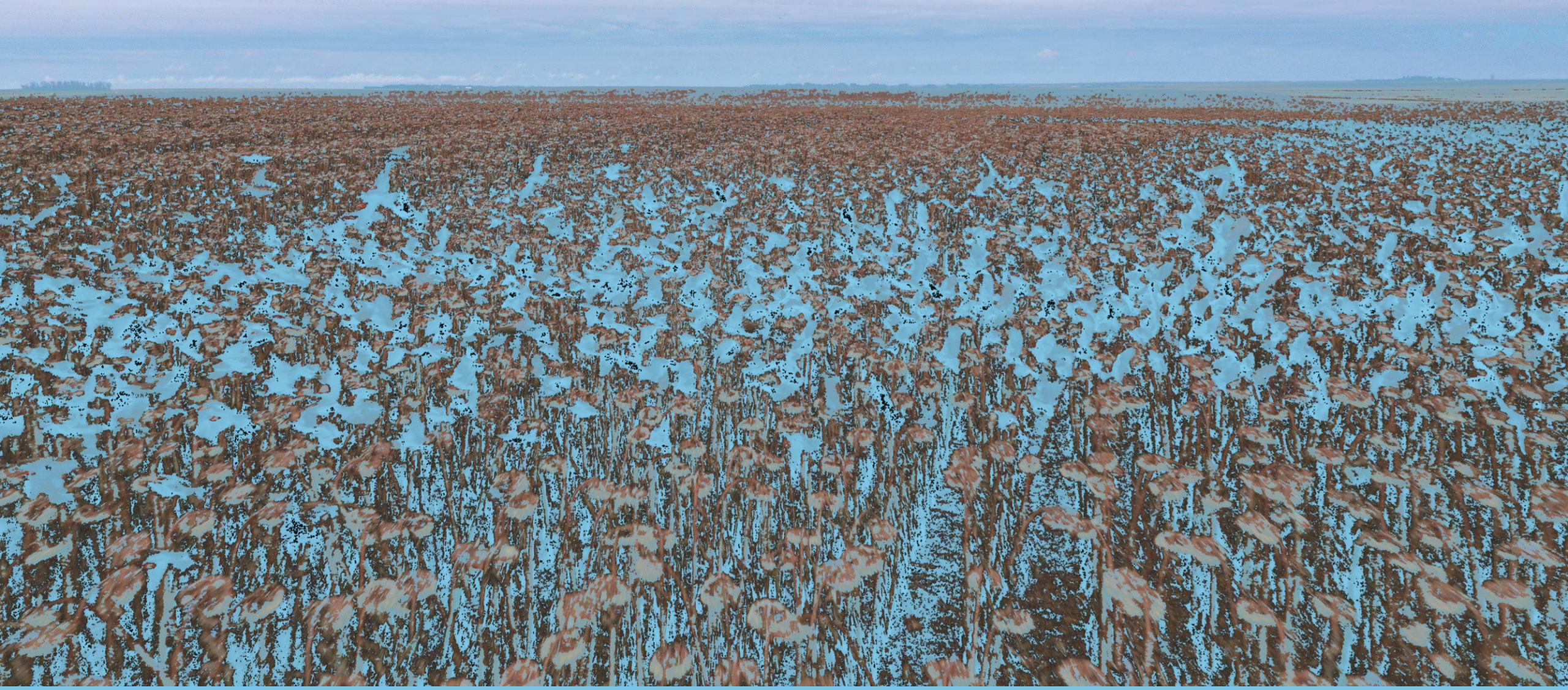
Birds hide well in the fields

Remove vegetation BG for detection

BG moves -> BG removal not easy

Filter out pixels with dominant colors

4-channel Image: RGB + Filtered BG

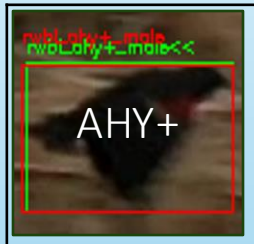


4-channel Image: RGB + Filtered BG

Results Boosted: From ~28% to 65% Accuracy

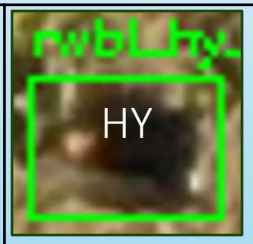
OVERALL DETECTION & CLASSIFICATION RESULTS

ACCURACY, PRECISION & % CORRECT



n = 5,450
ACCURACY: 77.2
PRECISION: 78.3

90.5%
CORRECT



n = 760
ACCURACY: 55.5
PRECISION: 55.8

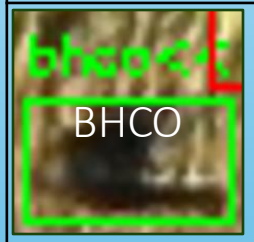
27.3%
CORRECT

n = 3,331
ACCURACY: 61.5
PRECISION: 62.4

79.6%
CORRECT

n = 866
ACCURACY: 55.8
PRECISION: 56.2

45.9%
CORRECT



n = 35
ACCURACY: 100
PRECISION: 100

0%
CORRECT

n = 72
ACCURACY: 59.7
PRECISION: 60.6

39.5%
CORRECT

n = 23
ACCURACY: 47.8
PRECISION: 47.8

54.5%
CORRECT

n = 9,135
ACCURACY: 61.1
PRECISION: 62.6

94.8%
CORRECT