



1) THE PROBLEM

Pinpointing the location of a water leak on a huge farm takes many man-hours. Workers comb through fields, hoping to stumble across a single noticeable leak.



With the current draught in California, it is vital to modernize this process.



Visible

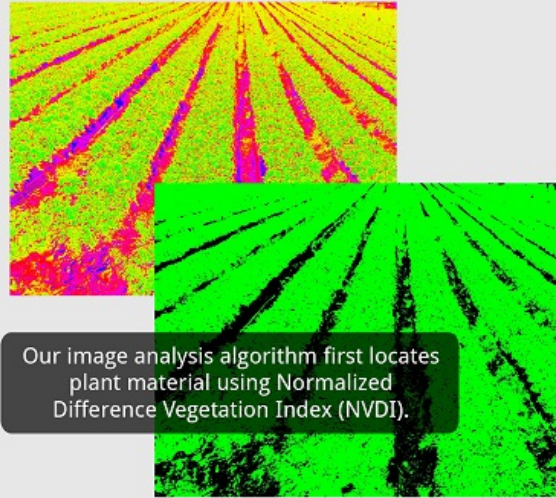


Infrared

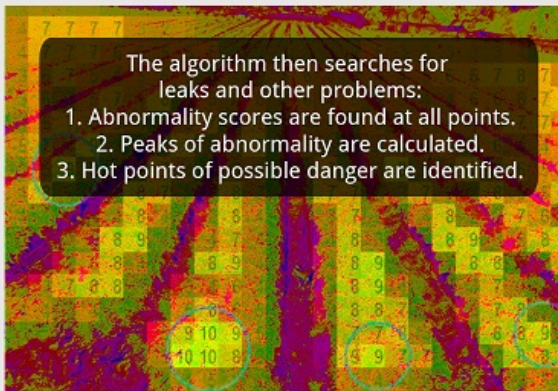


2) OUR SOLUTION

PowWow can detect WHEN a water leak occurs, but NOT WHERE. To locate leaks, we send out a UAV (see bottom left) to take aerial pictures of the farm in both the visible and infrared spectrum.



Our image analysis algorithm first locates plant material using Normalized Difference Vegetation Index (NDVI).



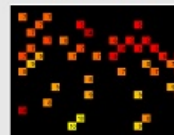
The algorithm then searches for leaks and other problems:

1. Abnormality scores are found at all points.
2. Peaks of abnormality are calculated.
3. Hot points of possible danger are identified.

Scores



Peaks



Hot Points

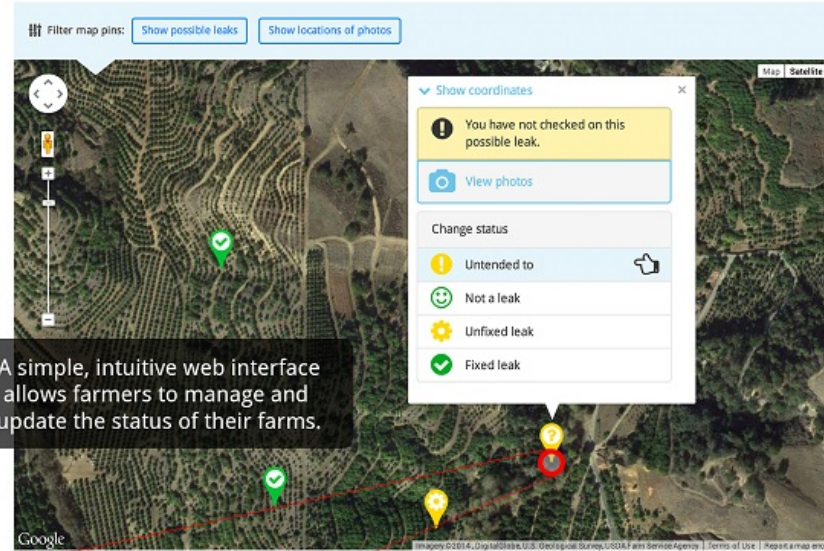


3) DATA DISPLAY

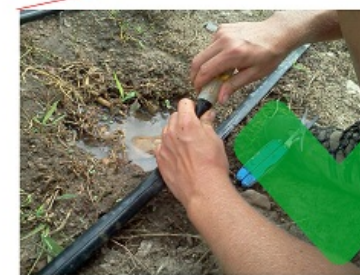
The farmer receives GPS coordinates of possible problems.

(1) Unfixed Leak

(1) Untended Possible Problem



A simple, intuitive web interface allows farmers to manage and update the status of their farms.



4) THE BIG PICTURE

Leaks are fixed faster. Precious water is conserved. Crops stay healthier. Money is saved by farmers, and for the consumers.

Web server



in



Image Analysis



in

C++

Front end



```
String Cheese =
"Drew Hascall \n
Alex Hutric \n
EJ Fernandes \n
Jason Worden";
```

```
/* Thanks to
Chandra Krintz,
Geoffrey Douglas,
Tim Sherwood,
Janet Kayfetz,
and our mentors
Olivier Jerphagnon
and Jim Klingshirn. */
```