



Weed detection In malze fields

A Greg Dye project

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Overview



Is it possible to help new South African farmers increase their yield by proactively pruning away the weeds that grow kill crops?

To answer this I coded a Neural Network that identifies whether or not a young plant is either the target crop (maize) or another plant based off of the top eleven most common weeds in the area



Understanding the problem

01

As residents of South Africa look to support their family, they frequently turn to farming their land to make ends meet. There are thousands of small scale farmers growing white maize on 2.7 million hectares of land

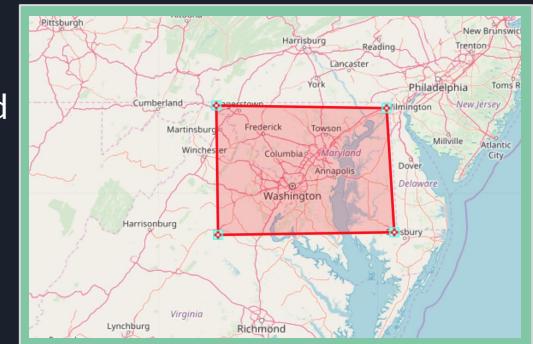
02

Unfortunately Farming comes with it's own hardships. Weed can destroy an entire season of crops if left unchecked

03

According to the University of Pretoria:

"Generally, depending on the level of weed control practiced yield losses can vary from 10 to 100 %. Rarely does one experience zero yield loss due to weeds."





Project objective



Using 5500 sample images from 12 classes, design a deployable Neural-Net That will quickly and easily give farmers insight into the percentages of their crop/weed ratio.

Target audience

South African Farmers in their first five seasons.

- Low experience can lead to mismanagement of weeds and over or under-pruning
- This product will help turn a profit for farmers operating on very thin margins.
- Little time lost compared to visually inspecting plants. Simply snap a picture and move on.



Under the Hood

A visual representation of the neural network:



Convolutional 2D

Looks for borders by comparing local pixels via dot matrix

MAXPooling

2X2 grid to condense layers using the max value

Convolutional 2D

Repeating the first 2 layers but with 64 nodes to find finer details.

MAXPooling

No strides or skips compared to the first pooling layer

Flattening layer

Reshaping data to prep for fully connected nodes

Dense

32 nodes connected to every part of the previous and sequential layer make this portion the bulk of the computational load

Dense

Output Layer, twelve classes for twelve nodes

LIVE DEMO



Future Developments

Online App development

Remake model for improved accuracy

Add classes

Various Language support



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QUESTIONS?

Thank you!

