A-Maize-ing Drones

An Aerial Agricultural Solutions Specialist

Team Presentation

Joshua Omolegan

2nd Year CS
at University of Oxford

Wayne Guoro

2nd Year Engineering
at University of Oxford

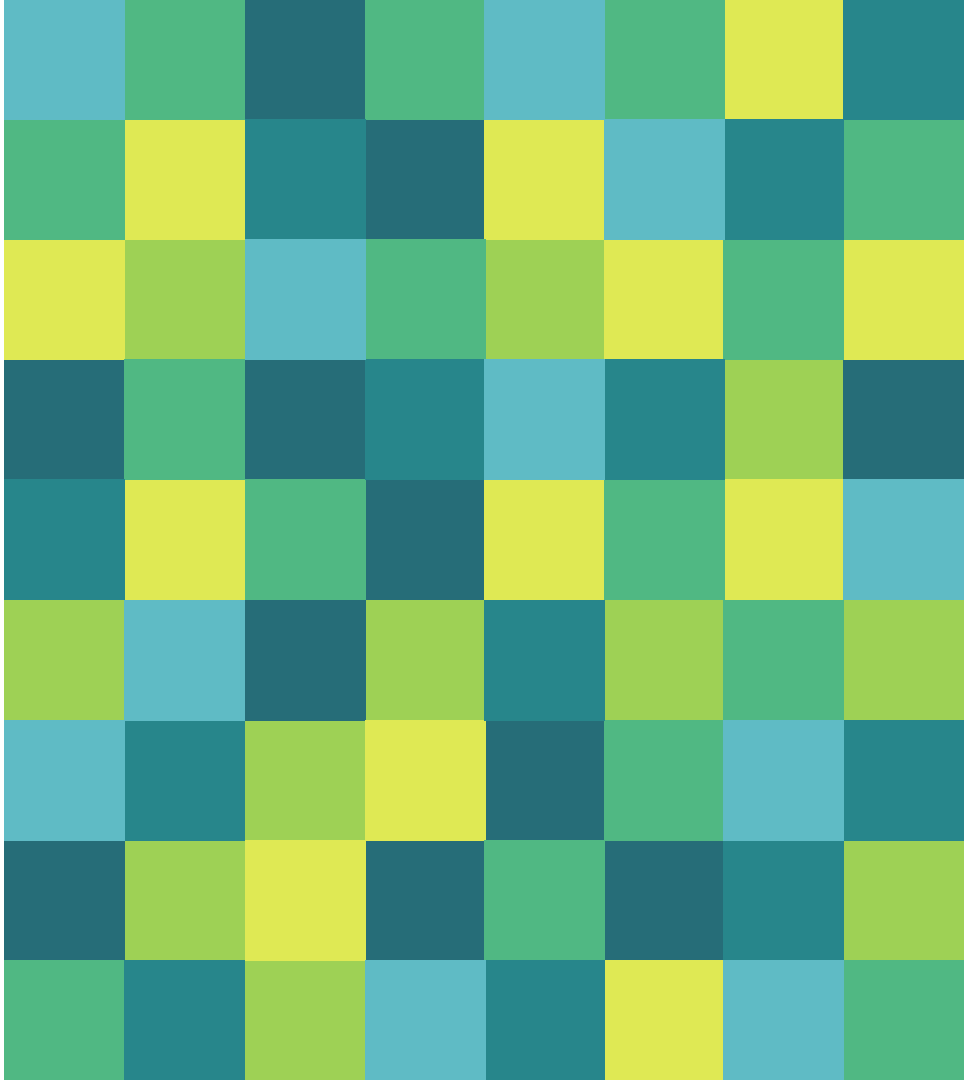
Abubakar Buwe

2nd Year M&CS
at University of Oxford

1.

Who are A-Maize-ing Drones?

Let’s start with the first set of slides



Agriculture

Ending hunger, achieving food security and promoting agriculture is UN SDG 2 goal. Agriculture is one of the most powerful tools in the battle to end extreme poverty and feed a projected 9.7 billion people by 2050.

In some developing countries, agriculture can account for more than 25% of GDP, with 65% of poor working adults making a living through agriculture. Globally, agriculture alone accounted for 4% of GDP.

Current Landscape

Together with rice and wheat, maize provides at least 30% of the food calories to more than 4.5 billion people in 94 developing countries.

About 67% of the total maize production in the developing world comes from low and lower middle income countries; hence, maize plays an important role in the livelihoods of millions of poor farmers.

Current Landscape

But e.g, in sub-Saharan Africa, where maize is the main food source for 300 million people, the crop needs plenty of water and irrigation to thrive, and climate change has wreaked havoc with rainfall patterns, which can mean that the crop might die right towards the end of its lifecycle. This in combination with the common problem of weeds presents a serious problem to farmers.

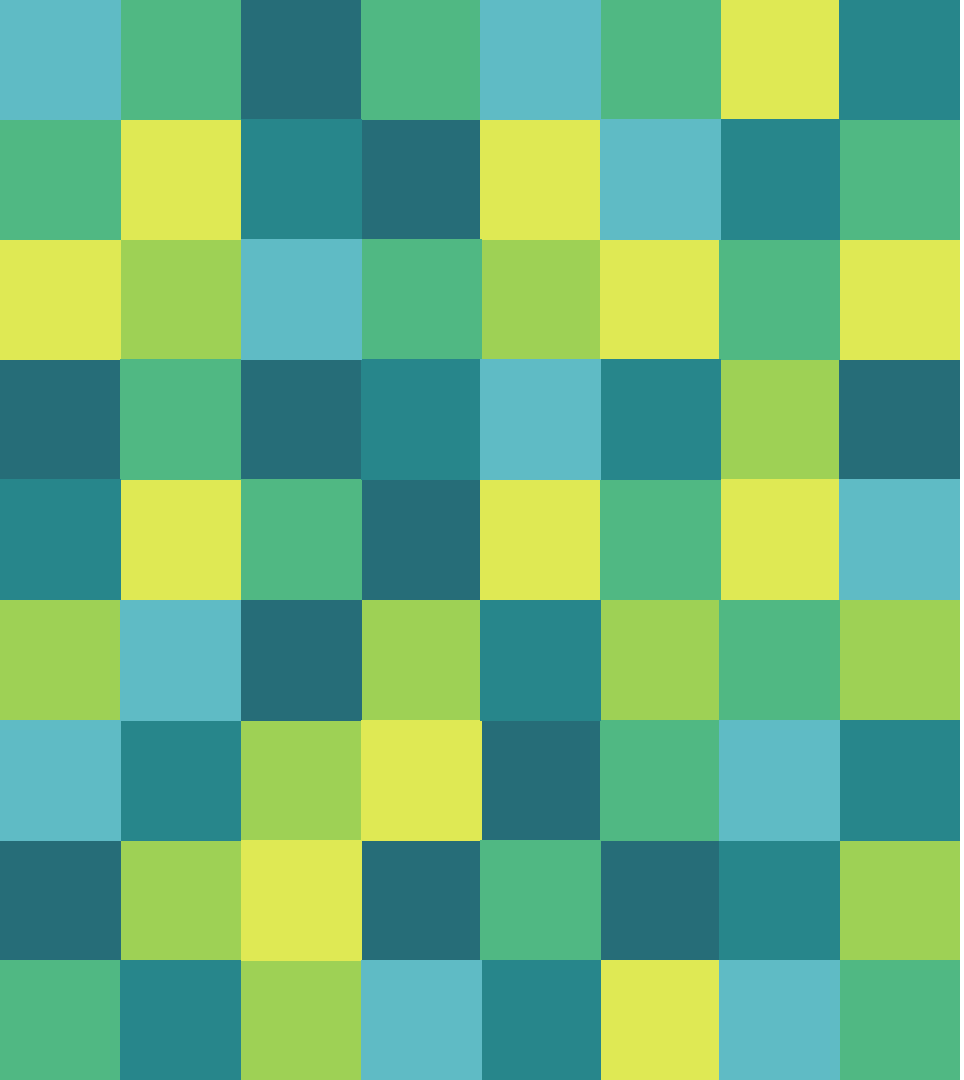
Challenges

Main Challenge: ESG

- *"The theme of HC 2022 is ESG, which stands for environmental, social and governance. Widely used by socially responsible companies to evaluate their decisions and performance, ESG points out some directions in which we could make a difference. In this hackathon, we would challenge you, our participants, to hack towards disruptive innovations related to one or more aspects of ESG"*

Reply: Drones on the Edge

- *"Apply your creativity, knowledge and skills to generate an innovative and feasible business case applying 5G, edge computing and AI to smart drones. Think about what you can apply your idea to: it could be something completely new or you can try to improve an already existing solution. We will provide you with the platform and guidance to bring your case study to life if you feel ready – but this is not mandatory.Your innovation is the only requirement! Remember that your case study needs to be innovative, feasible and must potentially sell it."*



2.

What is our solution?

Weeds

Our solution is to distribute drones that are able to assist with agricultural growth to protect/increase plant yield.

Our drones would be equipped with a camera that is streaming the video feed into a neural network that is running on AWS Cloud.

This NN then returns the likelihood of there being a presence of weeds in a given section of the farm - the farmer could then review the video feed and target the higher priority areas of the farm.

ESG Benefits

Financial

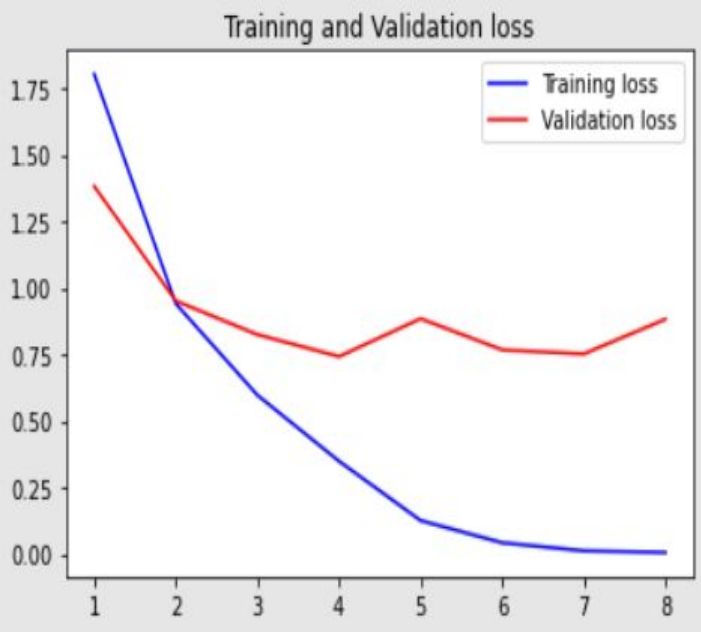
Implementation of our solution ultimately benefits communities as it ensures the continued production of maize and a steady income for local farmers.

Food Inequality

This ultimate keeps the price of maize down in poorer communities and therefore helps to ensure the poorest people can still access food.

Fair for farmers

This solution is also designed to protect farmers jobs - it doesn't look to replace their physical labour, just make them work smarter and protect existing income streams.


Training and Validation loss
Training loss
Validation loss
1.75
1.50
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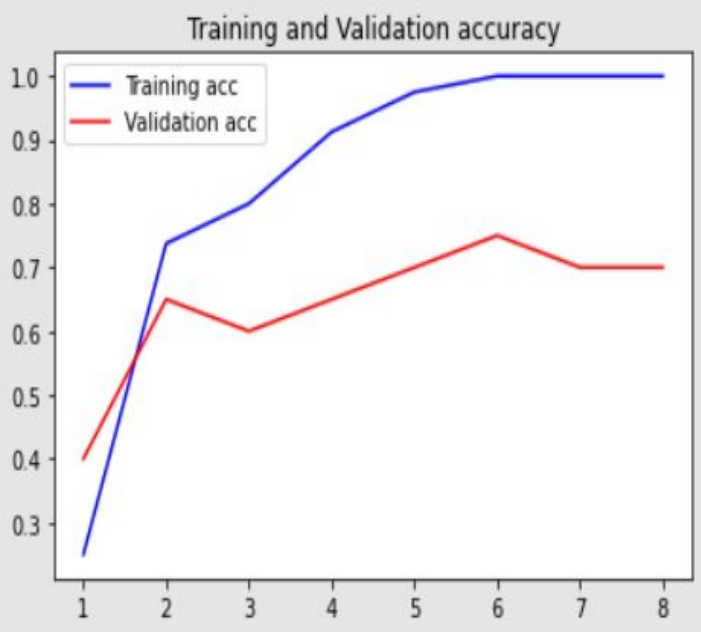
Training and Validation accuracy
Training acc
Validation acc
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0.6
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0.4
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1
2
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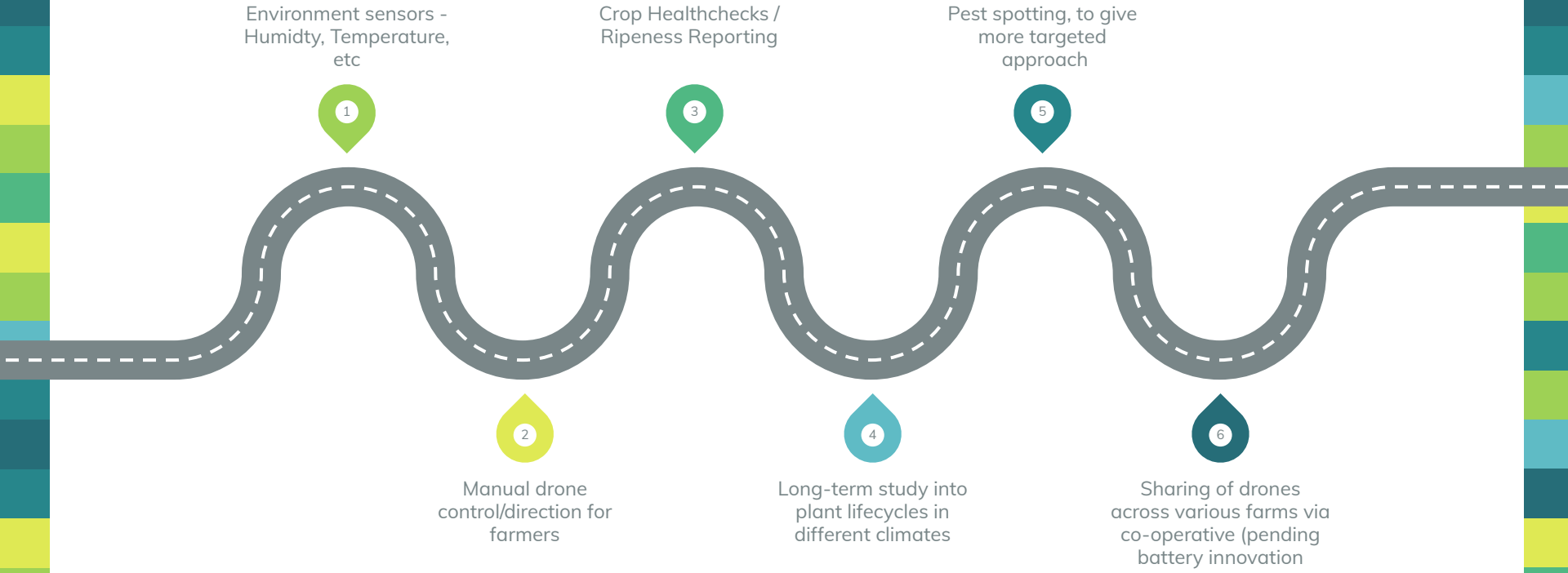
6
7
8

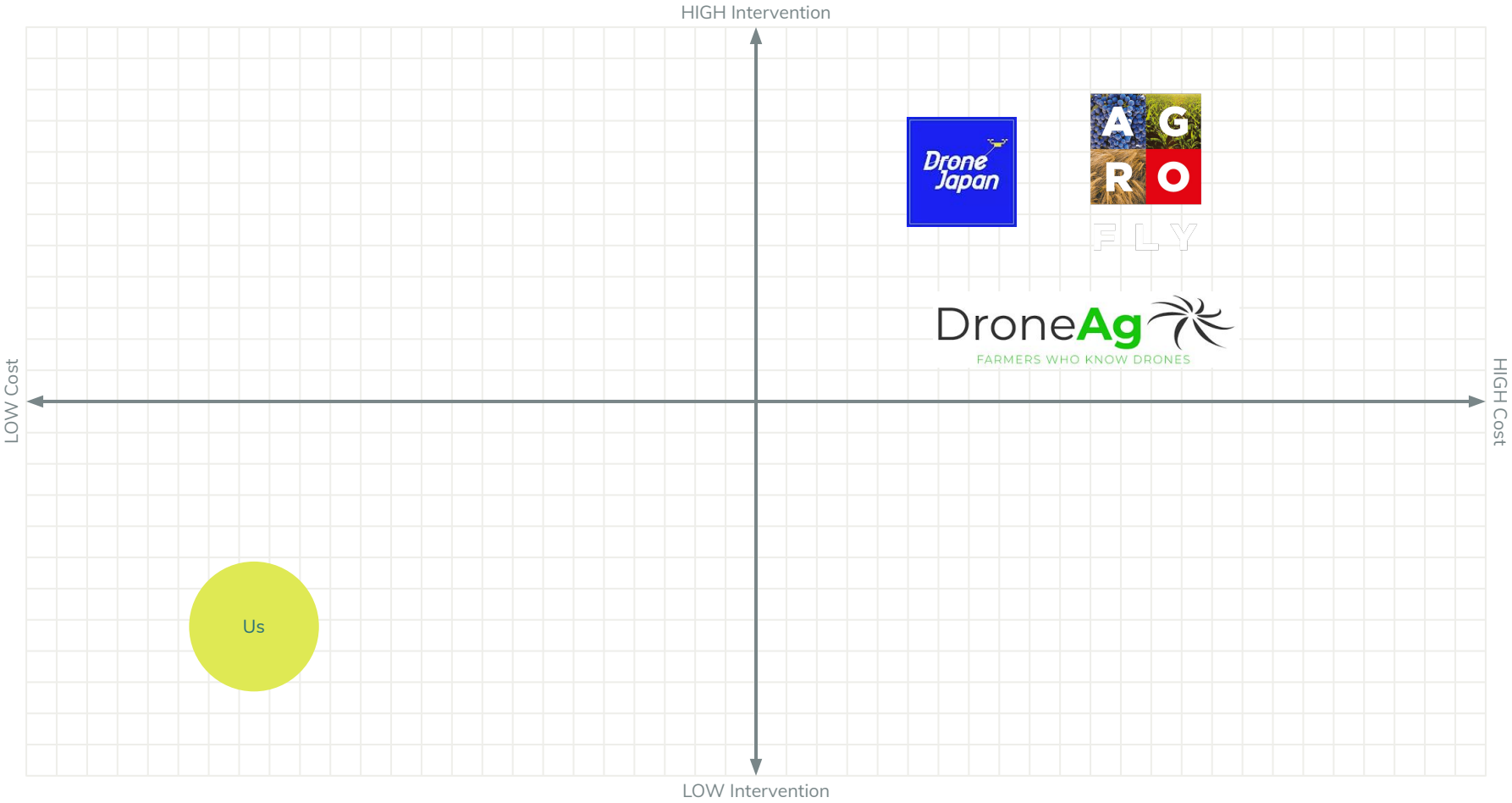
REFLECTION

- In future we would like to offer a wide suite of services regarding aerial surveillance
  - Crop health check/ripeness
  - Humidty/temp checks
  - Building wider database/dataset regarding biodiversities
  - Pest spotters and identification
    - to enable farmers to have a targeted approach to ridding of pests

Roadmap


Environment sensors - Humidty, Temperature, etc
1
Manual drone control/direction for farmers
2
Crop Healthchecks / Ripeness Reporting
3
Long-term study into plant lifecycles in different climates
4
Pest spotting, to give more targeted approach
5
Sharing of drones across various farms via co-operative (pending battery innovation
6

Competitor Matrix



Thank you for listening!