



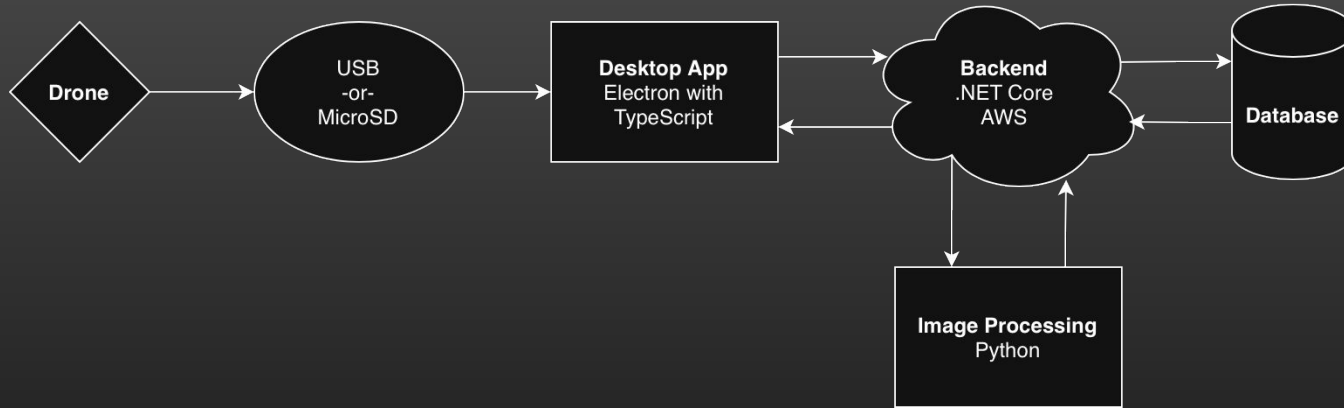
THE AI-IADSSCHM

*AI-Integrated Autonomous Drone System for Smart
Crop Health and Harvest Monitoring*

sdmay26-20 · Jongmin Lee · Z Harvey · Andres Lopez · Alex Pallan
Camden Senneff · Caleb Zea · Srdan Kopunovic

PROJECT OVERVIEW

- Farmers need to monitor crops
- Drone captures images of their plot
- Images are processed under AI algorithm
- App functionality



HARDWARE PROTOTYPING



HARDWARE PROTOTYPING

DJI Mini 4 Pro

- + Low hardware risk.
- High software risk.
- Missing requirements.

Custom 10"

- + Satisfies requirements.
- + Best flight ability.
- High hardware risk.
- Safety.

Partial Pre-Built 4"

- + Satisfies requirements.
- + Low hardware risk.
- + Safety.
- Delivery time.

HARDWARE PROTOTYPING

UAS

- Follow laws
-

Recent safety concerns

- Learn from others
-

Meeting with Dr. Jones

- Guidance
-

Addressing safety

- Slowly increment drone capabilities

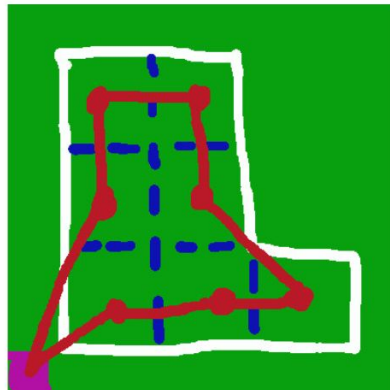


FRONTEND PROTOTYPING

- UI/UX
- Testing

React helps with all of these

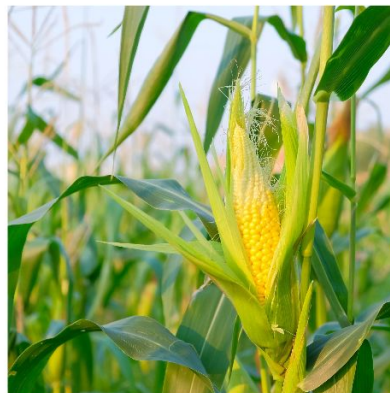
AgDrone Control Panel



Crop Health:

0 warnings

[Click for more details](#)



Flight Data:

Battery use: 75%

Flight time: 30 minutes

Field coverage: 90%

Hazards: 0

FRONTEND PROTOTYPING

Current Map

Still need

- Grid
- Flight path
- Start/end



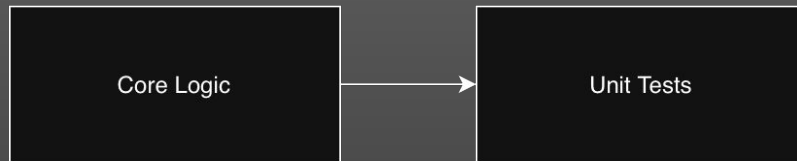
Imagery ©2025 Airbus, Maxar Te

BACKEND PROTOTYPING: Core | Data | API

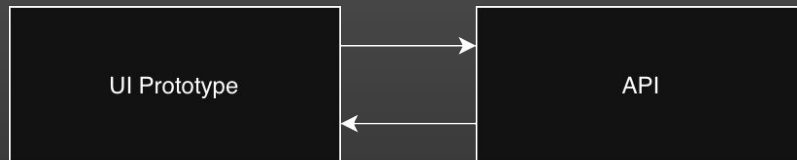
Goal: Validate backend data flow and API reliability before hardware integration.

- Core Logic Creation
- Unit And Regression Testing
- API Development
- Data collection for further improvement

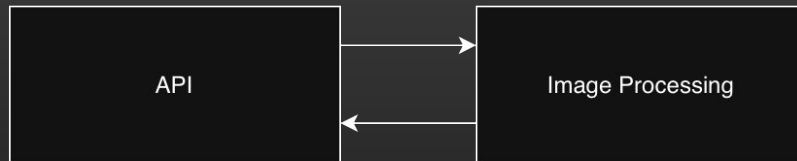
1.



2.



3.



BACKEND PROTOTYPING

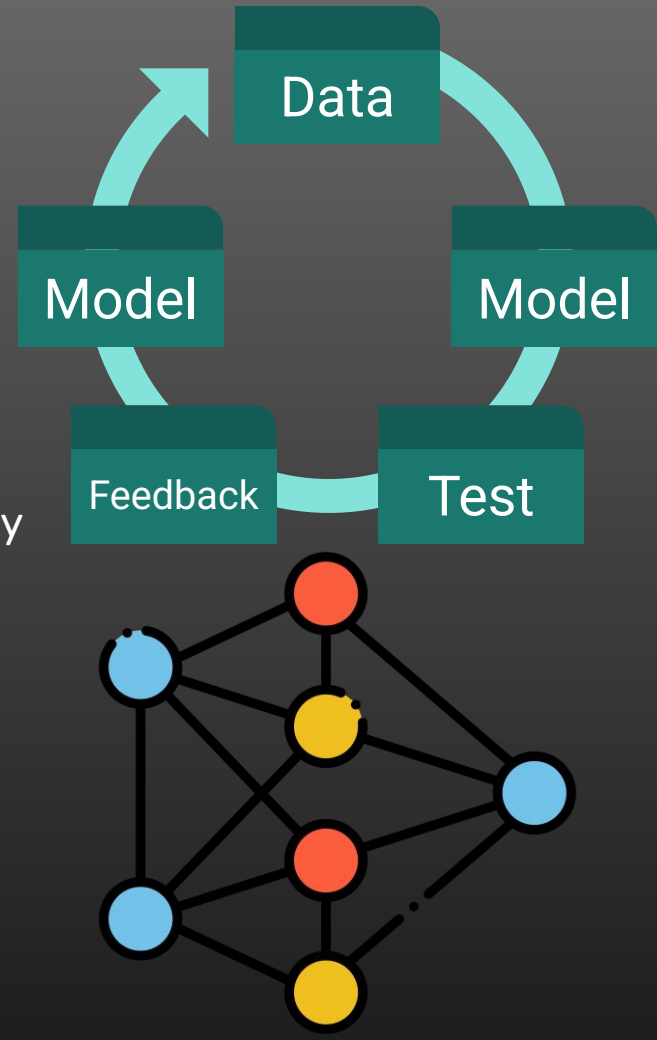
Cloud

- CI/CD GitLab Runner
- Infrastructure Management
 - AWS
 - RDS
 - Cognito
 - Terraform



AI PROTOTYPING

- **Purpose**
 - Apply prototyping principles to AI models
- **Strategies**
 - **Relaxed Requirements:** train on small datasets first
 - **Subsystem Isolation:** test vision model separately from drone.
 - **Virtual Prototyping:** simulate prediction before deployment
 - **Iterative Improvement:** Retrain -> Evaluate -> Refine
- **Outcome**
 - Faster feedback and lower cost
 - Early detection of design issues
 - Gradual improvement in accuracy and reliability



QUESTIONS