DIGITAL TWINS FOR INDUSTRIAL GREENHOUSES

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THE PROBLEMS

Inaccessibility of greenhouses manifests **monitoring costs**

Individual plant screening leads to **prohibiting labor** intensity

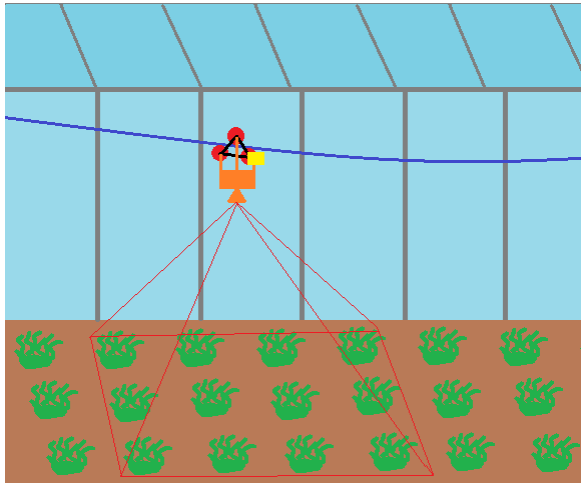
Lack of close and continuous data-streams **halts health & growth check-ups**

Infrequent updates **increase failure response times**

Current automated solutions are rather **expensive** and hard to implement or **lack required detail**

THE SOLUTION

Our cablelift-based image ingestor and processor edge IoT module



- Individual plant monitoring with edge-AI
- Low-cost hardware and installation
- Data management for low-bandwidth metric updates and on-demand multimedia access
- Constant data ingestion and in-browser data visualization

UNIQUE VALUE PROPOSITION

Our logistically and economically inexpensive, zero-maintenance and zero-labor approach offers an industrial-scale solution and precise enough data-mining for NN-training applications

DIFFERENTIATING FACTOR

- **On-site** processing with lightweight AI
- **No-rail** installation using our image-mapping algorithm
- Achieved **image quality** enables smart-management, disease prevention and big-data options

OUR TARGET GROUP

Since our deployment kit will work with any **herbaceous plant** based **greenhouse** and at **any scale** we offer service to:

Small-scale farmers with remote facilities

Large-scale industrial producers

GMO research laboratories, universities and farms

WEBSITE DRAFT

- Per facility information (location, size, type ..), overall measurements (temp, humidity, robot status ..) and average plant metrics
- Disease or Infrastructure Failure warnings
- Insights and 'heat'-maps
- Individual plant measurements and metrics (health, growth, leaf growth…)
- 2D Digital Twin of each Greenhouse

KIT HARWARE AND PRICING

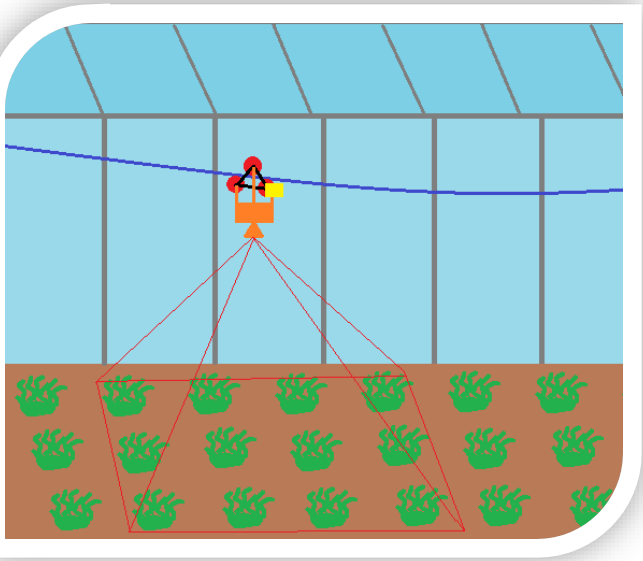
Kit price:
75 €
Monthly service fee:
10 €

Our kit features :

- Raspberry Pi Zero 2 W board
- 10 Ah Battery System
- 8MP Pi-Camera sensor
- DC Motor, Controller and 3D printed parts
- Distance, photosensitive, humidity, temperature sensors
- Automated Solar charger and supply
- LTE-WiFi station Module

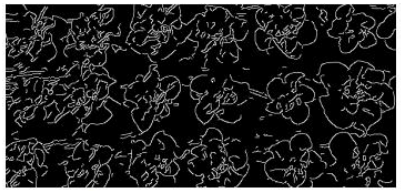
https://www.emnify.com/pricing

EDGE-AI V1.8



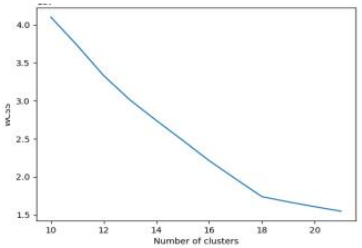
Αρχική φωτογραφία από google images

Φίλτρο edge finding Sobel



Elbow cluster graph

Παρατηρούμε πως στο 18 βρίσκεται η ανωμαλία «αγκώνα» άρα έχουμε 18 κέντρα



Εύρεση κέντρων βάρους με kmeans clustering για 18 clusters