SECA

Sensor Ecosystem for Controlling Agriculture

Challenge ID 16

PROBLEM DEFINITION

Across diverse landscapes, from urban rooftops to rural fields, unique challenges arise for agricultural monitoring. Existing methods frequently prove insufficient, resulting in underserved small to big-scale producers and affecting productivity and sustainability within agricultural systems as a whole.

SOLUTION PROPOSAL

In response to the need for effective agricultural monitoring in urban micro-productions, a scalable solution is proposed: a grid of wireless sensors featuring unique presets and waterproof design. These sensors are strategically placed in the soil and connected to a central processing node for data analysis, facilitating informed decision-making.

SOLUTION CONCEPTION

WebApp

- Data for each node for up to 12 months
- Notifications
- Weather search
- Battery Level

Server

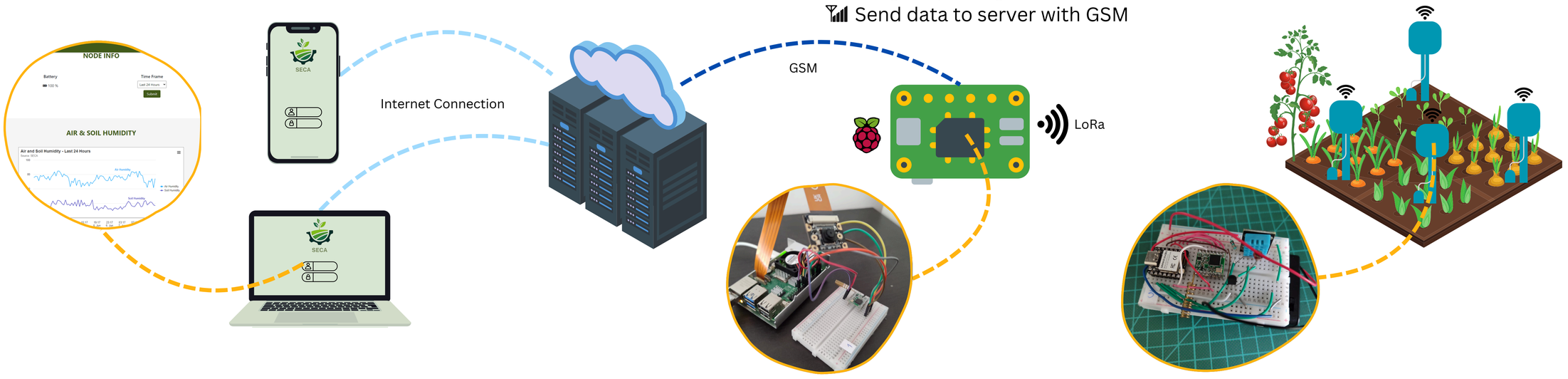
- Computer vision for tomato growth and diseases

Central Node

- Data collection from auxiliary nodes
- Image capturing
- Send data to server with GSM

Auxiliary Nodes

- Air Temperature
- Soil and Air Humidity
- Luminosity



POTENTIAL CLIENTS

- People with urban plantations:
  - Monitor micro-productions alongside everyday tasks.
- Farmers with small-sized plantations:
  - Easier crop management.
- Medium and large-sized producers:
  - Reduced workload;
  - Lower costs;
  - Higher customizability.

COMPETITORS

Our main competitor is pycno, whose approach closely resembles ours. However, we offer several distinct advantages that set us apart.

- Computer Vision Model: Our application uses advanced computer vision technology to:
  - Identify plant diseases.
  - Predict harvest dates.

These features make our solution more comprehensive and efficient for managing plantations.

COSTS & FUTURE PLANS

The prototype has a manufacturing cost of $200. In the future, our sensor network will integrate algorithms that predict the crop cycle's completion date, considering cumulative sunlight, growth stages, and upcoming weather patterns. Additionally, it will feature smart irrigation control, optimizing water usage to mitigate stress, prevent diseases, and maintain plant health. These advancements will offer significant benefits beyond solving the initial problem, enhancing crop management efficiency, improving yield predictability, and promoting sustainable agricultural practices.

RESULTS

Our solution features sensors engineered to measure air temperature and humidity, soil humidity, and sunlight levels, utilizing low-power wireless technology for data transmission. Sophisticated software will analyze this data, providing insights for enhanced crop management optimization. Potential users have expressed considerable enthusiasm about the presented solution, noting that the collected data could prove to be extremely useful. Furthermore, tests of the sensors and the web app's data display have confirmed their excellent performance and reliability.

Our Website

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