Hunger Zero:

Agriculture Optimization Using Modern Technologies

Universidad Tecnológica Nacional, Facultad Regional Paraná, Electronics Engineering Department, Inglés II. - Amateis Gonzalo, Colli Facundo, Larrosa Genaro. - 2023

Introduction

End hunger, achieve food security and improved nutrition and promote sustainable agricultura [1]

How can hunger be reduced?

Agriculture 4.0

Digital transformation in the agricultural sector

Real-time interactions between people, products and devices during the production process

https://elcolonoderafaela.com.ar/contenido/1582/los-precios-de-los-principales-cultivos-se-mantuvieron-estables-esta-semana#&gid=1&pid=1

What is the work purpose?

The purpose is to address the global issue of hunger by exploring how the agricultural industry can increase its productivity and obtain high-quality food products using Agriculture 4.0 technologies.

https://www.heraldobinario.com.mx/tendencias/2022/6/24/onu-advierte-sobre-ola-de-hambre-mundial-pide-ayuda-al-g7-para-evitar-catastrofe-alimentaria-26520.html

Route Map

- Exploring the quality concerns in agriculture
- Proposing a problem approach
- Analyzing advantages and disadvantages of the approach

Work Impact

- **To raise awareness** about the important impact that agriculture has on the life of each individual
- To show how **to improve the quality** of agricultural products

Quality Concerns in Agriculture

Current agriculture faces a **crucial problem** in terms of **low productivity** and **lack of optimization** in production systems.

Quality Concerns in Agriculture

The lack of adoption and utilization of new agricultural technologies in current practices leads to significant **consequences:**

- Production losses

- Low-quality food

- Economic losses

- Delays in harvesting

https://www.flaticon.es/icono-gratis/perdidas_3133565

Quality Concerns in Agriculture

For the year **2050**, it is estimated that global food production will need to increase by approximately **60%** to **70%.**

It is important to begin the **implementation of new methods** that allow us to further improve productivity.

Problem Approach

Agriculture 4.0 uses tools based on the **Internet of Things (IoT)** to optimize the process of cultivating the land through **real-time monitoring**, **data storage** and **automated evaluation**.

Problem Approach

What technologies are used in Industry 4.0?

- Internet of Things

- Sensor technology

- Robotics

- Cloud computing

- Big data

https://codexverde.cl/lanzan-programa-nacional-para-el-desarrollo-de-la-agricultura-4-0/

Problem Approach

Internet of Things is a network of interconnected physical objects and digital devices.

Sensor Technology

Sensors are used to measure parameters such as temperature, humidity, light intensity, heat and gas concentrations.
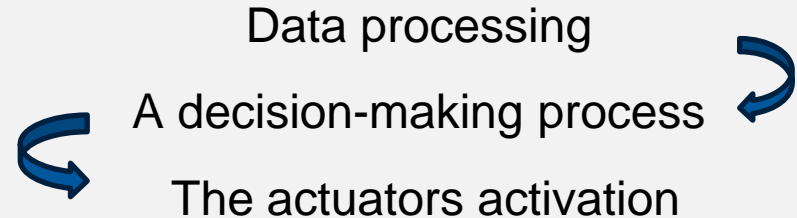
Sensor Technology

- **Remote sensing**

- **Wireless sensor networks** - Wireless sensor and actuator networks

https://www.fundacionaquae.org/wiki/tipos-de-riego/

Data processing

A decision-making process

The actuators activation

Robotics

An **agricultural robot** is described as "a mobile, autonomous, decision-making, mechatronic device that accomplishes crop production under human supervision, but without direct human labour". [4]

Cloud Computing and BigData

- Hardware and software for **storage service**

- Smart information systems that **transform data into knowledge**

- **Secure platform** for the development of agricultural IoT applications

- Analysis and interpretation of large volumes of data **(BigData)**

Advantages and Disadvantages of the Use of Technology in Agricultural Sectors

Advantages

- **Reducing** the **physical efforts** of farmers

- Improving **efficiency** by reducing work time in agricultural sectors

- Increasing **product quality**, demand and prices

Disadvantages

- Having high **maintenance costs**

- **Losing employment** for low-skilled workers

- Lacking practical knowledge and their **underestimation** of these technologies

Conclusion

- Role of technology

- Introduction to Agriculture 4.0

- Potential of Agriculture 4.0

- Pros and cons of technology implementation

References

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