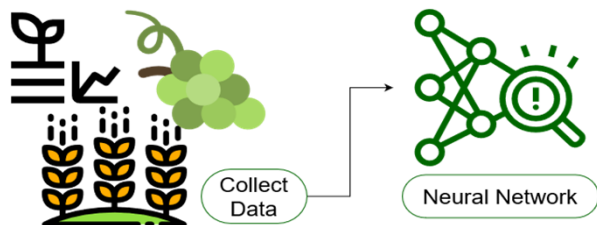


# Artificial Intelligence for Smart Agriculture

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**Artificial Intelligence** – Defines a collection of tools for understanding and explaining the data around us.

**Problematic:** Data can take many forms and are often too large for human analysis alone.

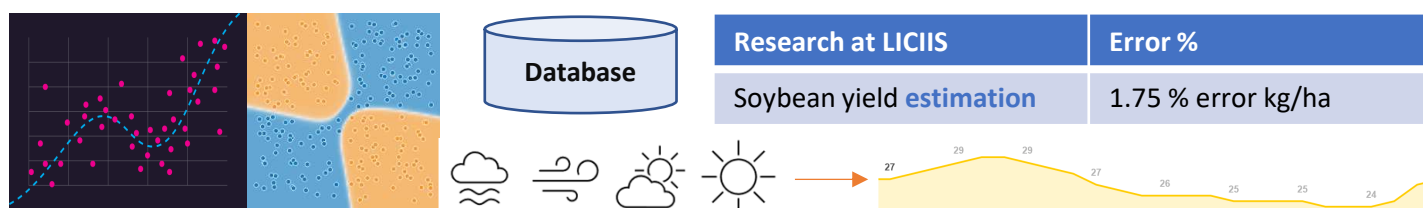


Agriculture is a significant **source of information**.

**Solutions:** AI takes place where agriculture needs more sustainability and addresses solutions to food insecurity (resources management, Defying diseases and parasites).

A dynamic field of AI research for smart agriculture focuses on **yield estimating** methods and **disease detection/identification**. Proposed solutions include yield monitoring.

**Yield estimation** – Linear regression - linear approach for modelling relationship.

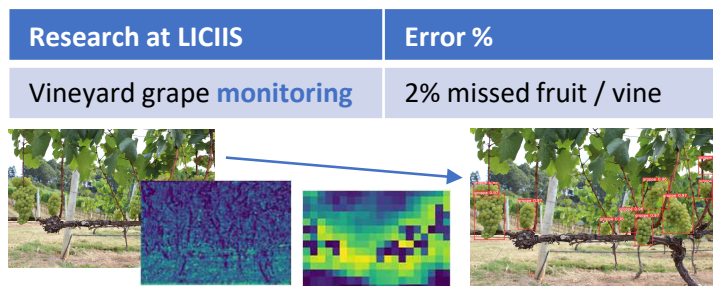


**Yield estimation** – Most methods done by human operators lead to high-margin error (30% to 50% in some cases).

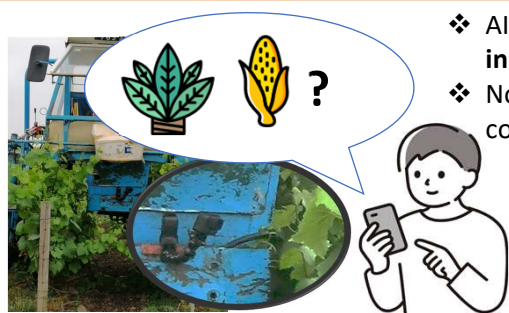
## Computer vision algorithms

- ❖ Estimating fruit weight and rentability before harvesting.
- ❖ Automatic yield monitoring.
- ❖ Yield Estimation.

Predicting a yield early enough allows for better management of the harvest as well as storage.

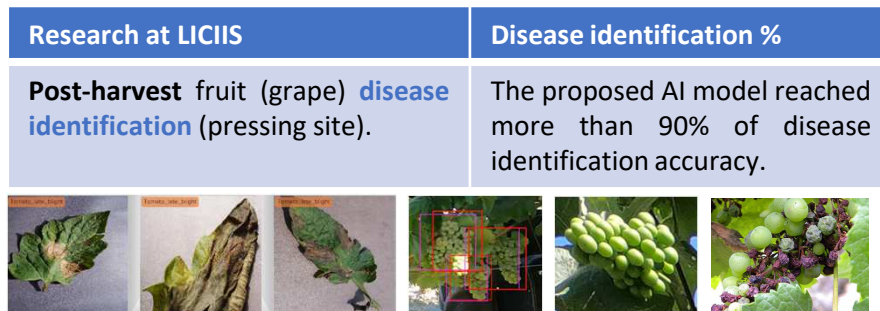


**Disease identification** - 20-40% of crop loss is due to diseases and pests. AI enables large-scale detection and outperforms humans in early disease detection.



- ❖ AI is used to identify diseases with an image RGB – **99% classification accuracy in laboratory conditions**.
- ❖ Nowadays, research focuses on real-time disease detection with on-field conditions.

Research at LICIIS focuses on low-energy efficient AI running on micro-controllers to reduce the impact on energy usage.



**Conclusion and perspective** – AI can help with farm data to understand agronomic phenomena.

- AI model can detect diseased fruits responsible for the loss of quality.
- AI gives more accurate transport planning and better human management through disease monitoring and early yield estimation.