



nulab

***AI Implementation in the
Quality and Food Safety***

29/04/2021





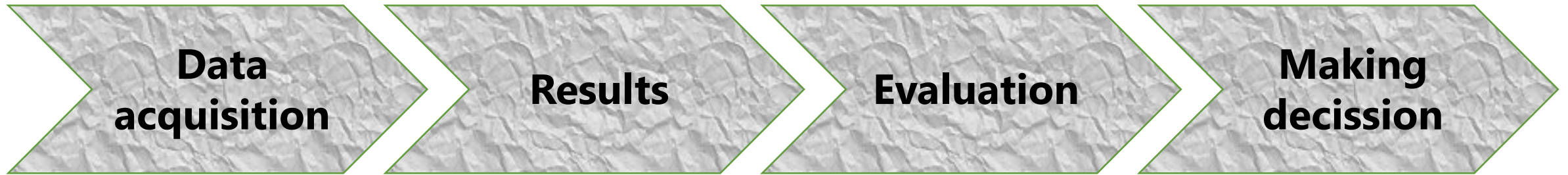
PURPOSE: HELPING TO IMPLEMENT LAB TO SAMPLE IN INDUSTRY

(PROCESS LINE, FIELD, RAW MATERIALS SUPPLY...)

Food sector challenge



To have information related to food quality and safety in real time



Goals

ON LINE CONTROL SYSTEMS



Artificial Vision

Irregularidades o defectos visibles



Thermography

• Diferenciación de temperatura

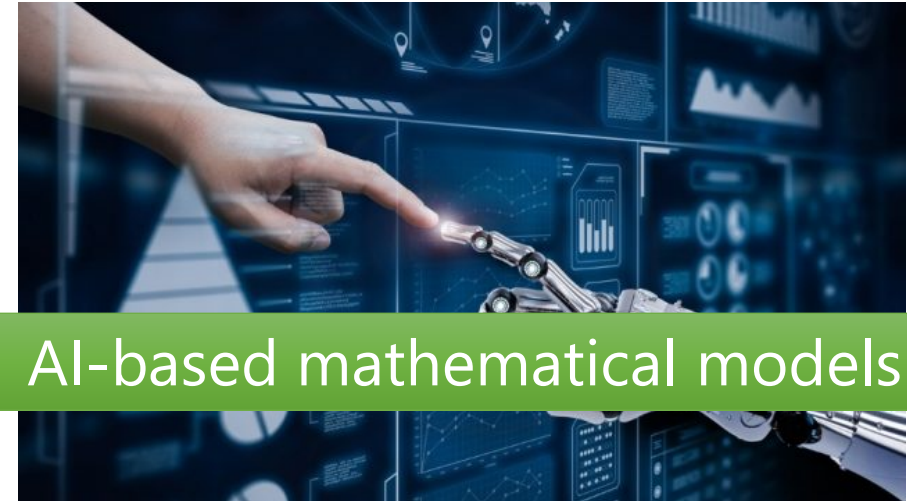


Hyperspectral Image /NIR

• Chemical Image



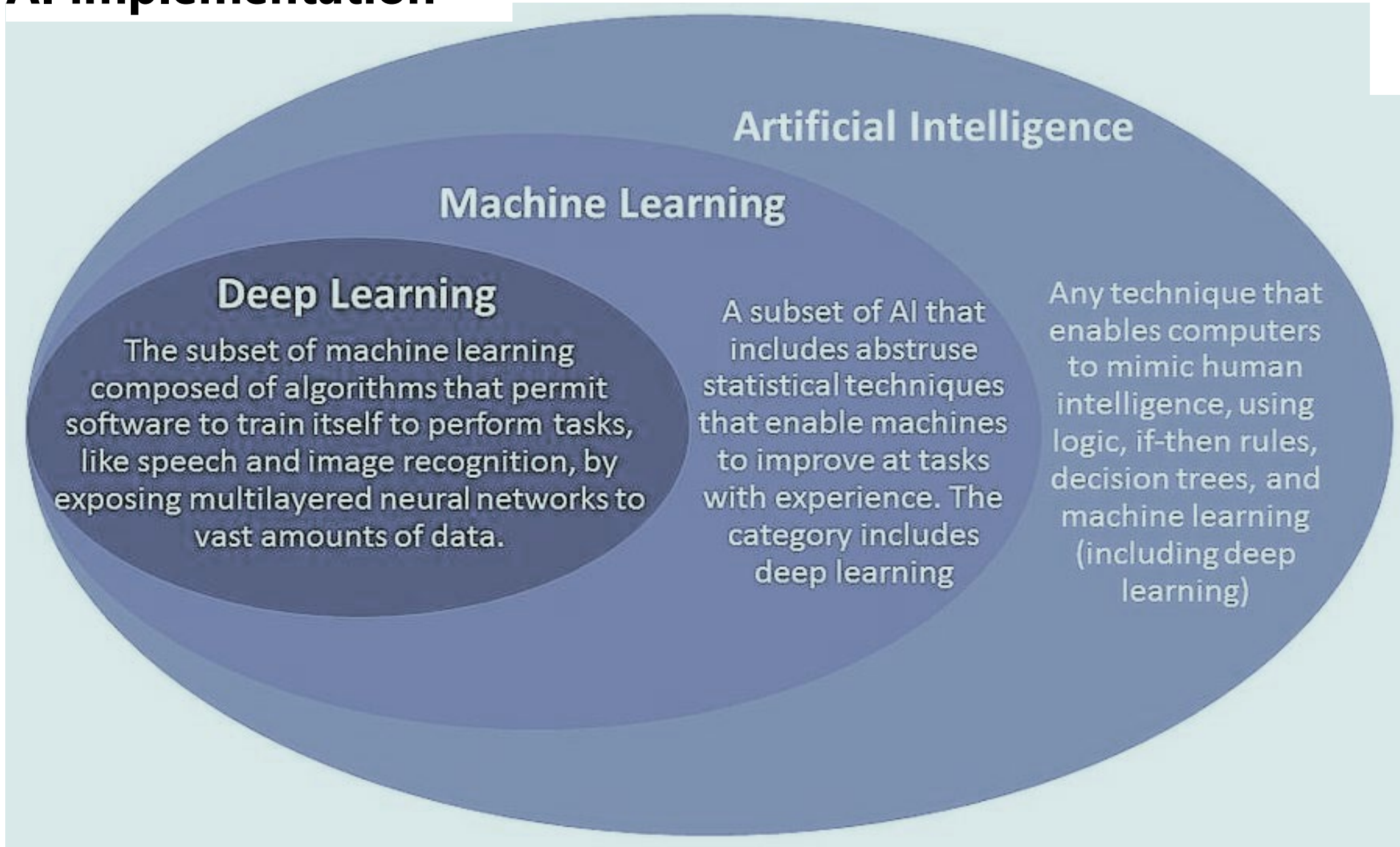
DATA PROCESSING



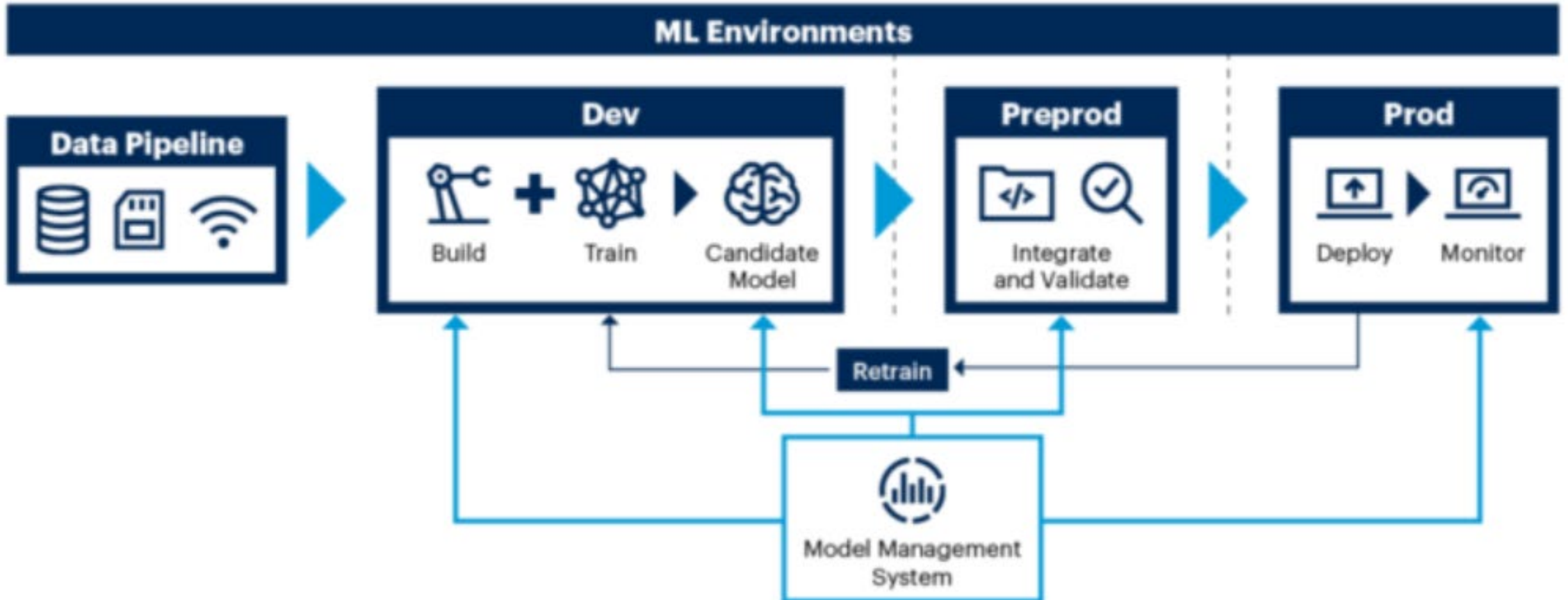
AI-based mathematical models

- ✓ Data available
- ✓ Domain knowledge
- ✓ AI system

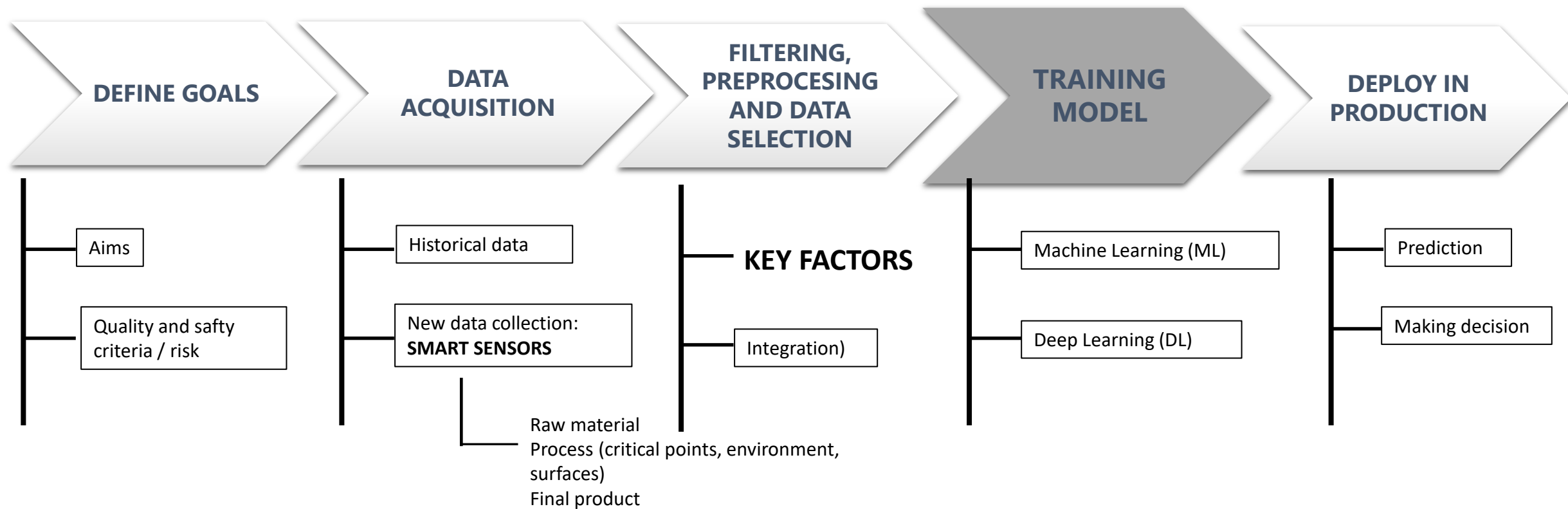
AI implementation



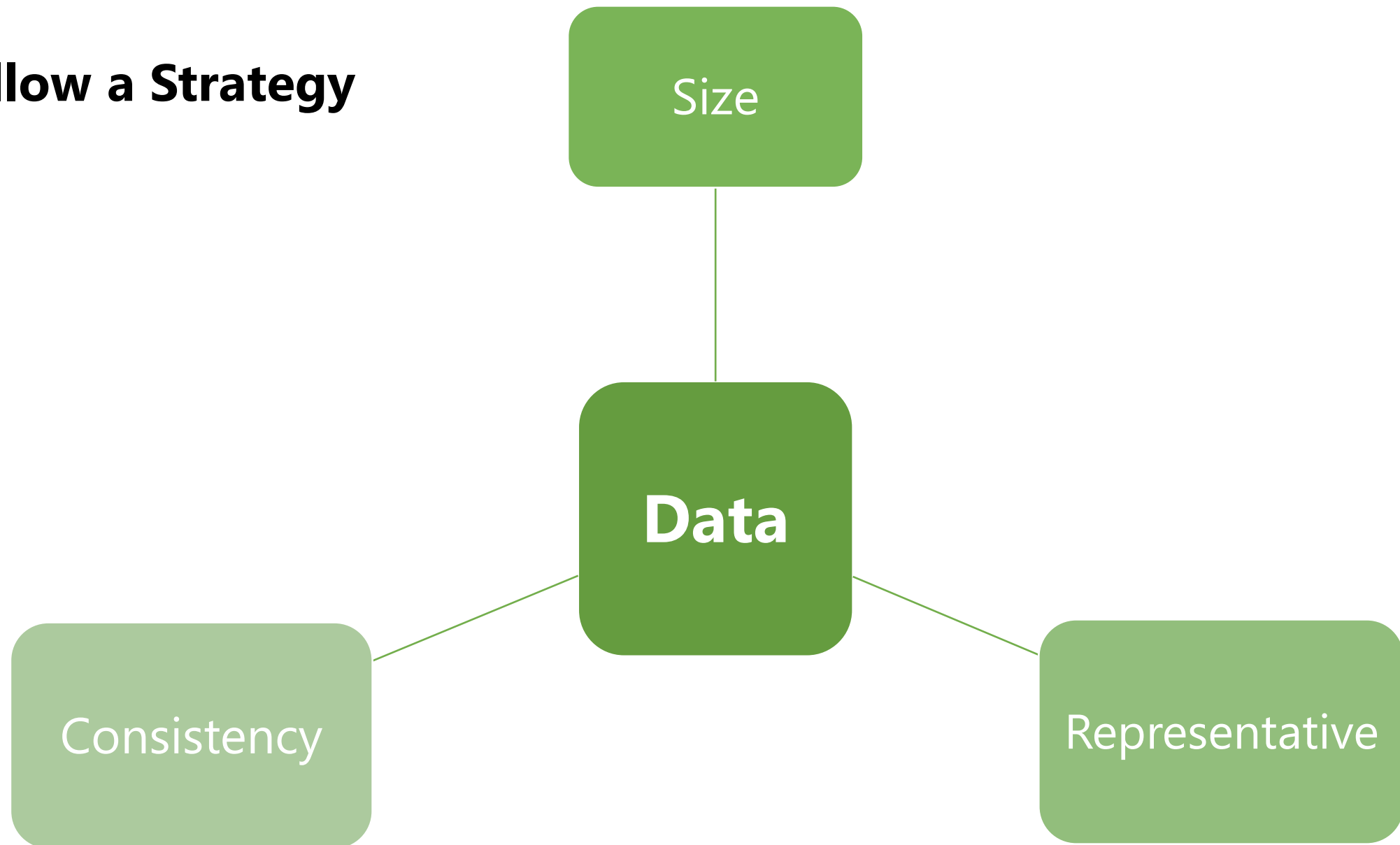
ML Pipeline



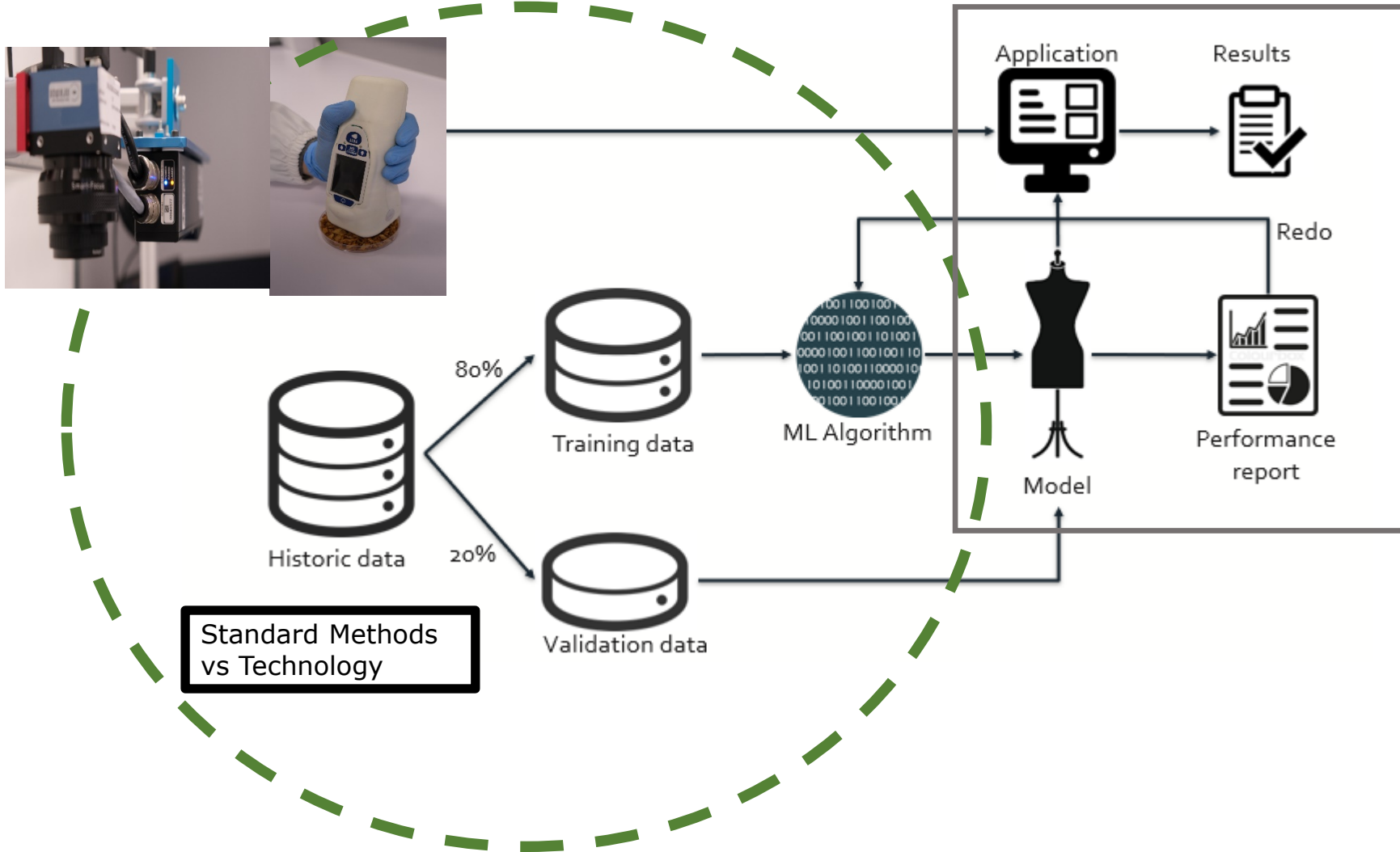
Lifecycle of an ML project



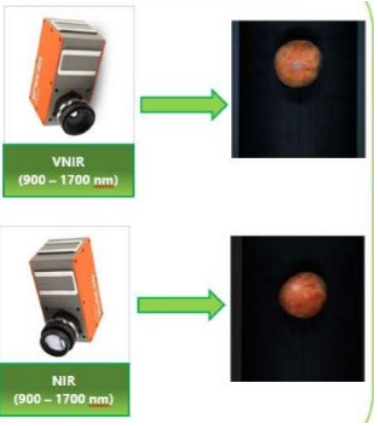
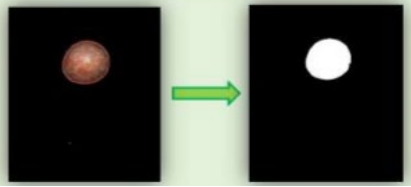
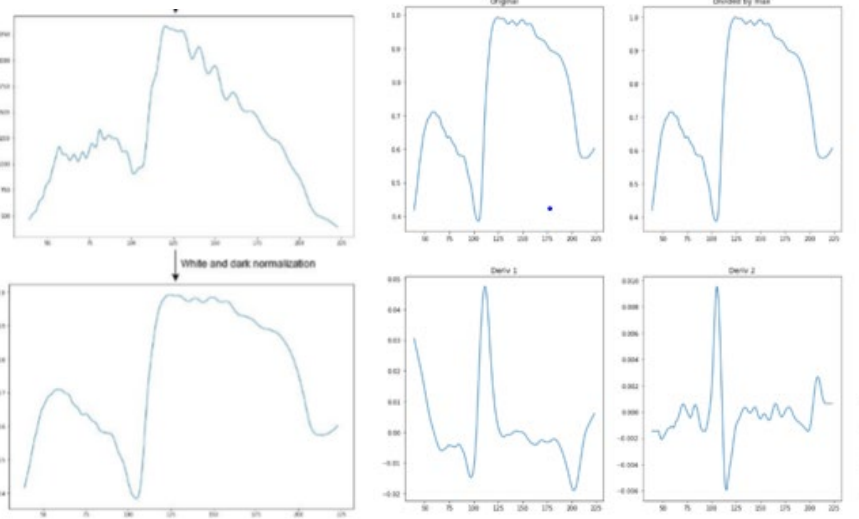
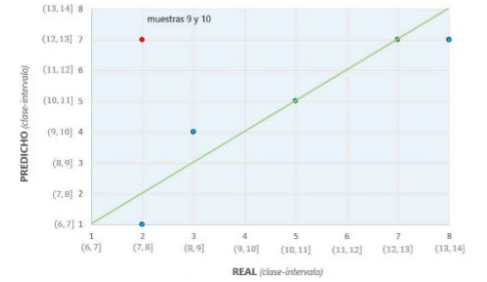
Follow a Strategy



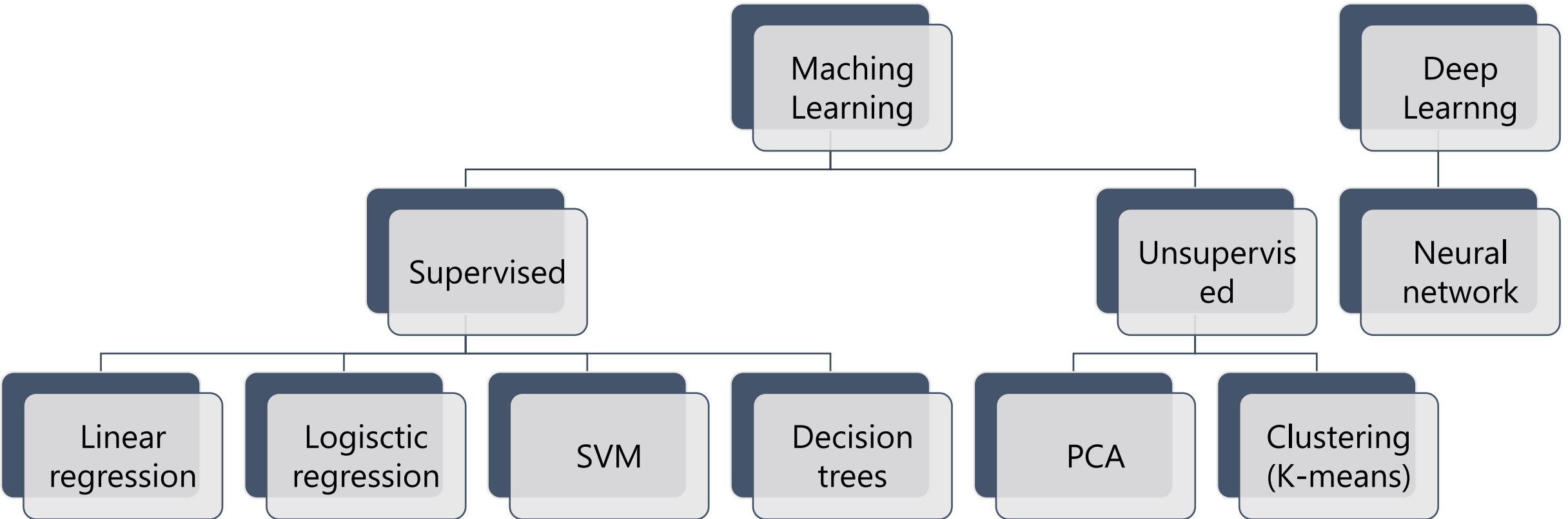
Training



ML Basics Algorithms

Image	Data		Model
<p>Acquisition proper data</p> <p>Camera type Experimental setup scale illumination</p> 	<p>Masking</p> 	<p>Preprocessing</p> <p>Normalizing Pretreatment</p> 	<p>ML Basics Algorithms</p> <p>Labeled Data</p>  <p>RMSEC</p> <hr/> <p>PLS RMSECV</p> <hr/> <p>R²Calibration</p> <hr/> <p>R² Cross-validation</p>

ML& DL Algorithms



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Conclusions



Limitations

- Small dataset and low consistent data
- Need for a multidisciplinary & qualified team
- Framework and tools

Advantages

- ML & DL algorithms emerge as a successful tools
 - ✓ Increasing dataset size
 - ✓ Increasing model size
 - ✓ Increasing Accuracy



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MUCHAS GRACIAS!

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