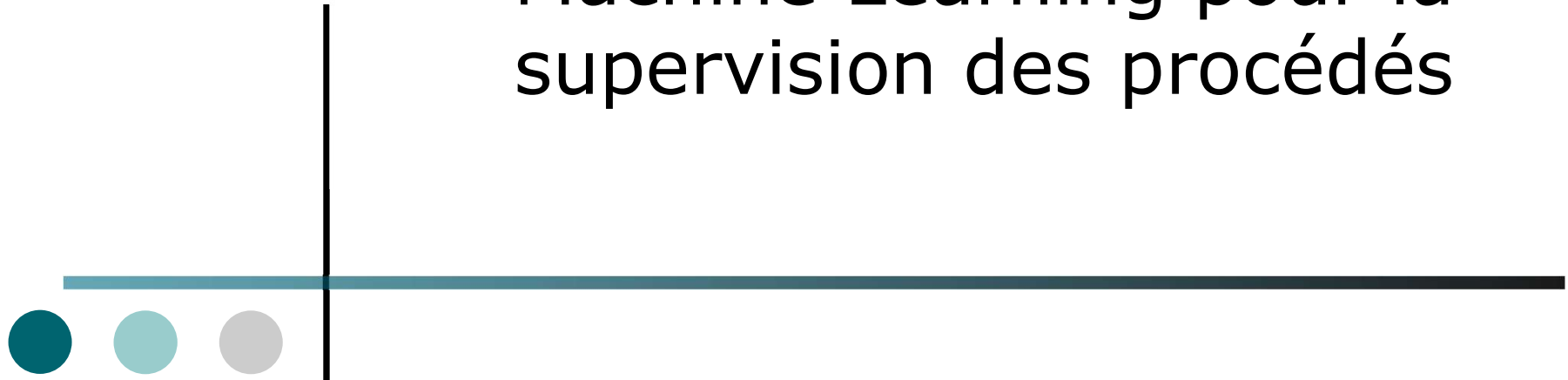


# Apport du Data Analytics et Machine Learning pour la supervision des procédés



Salon Analyse Industrielle, Paris, 09/20

Dr. Sébastien PREYS

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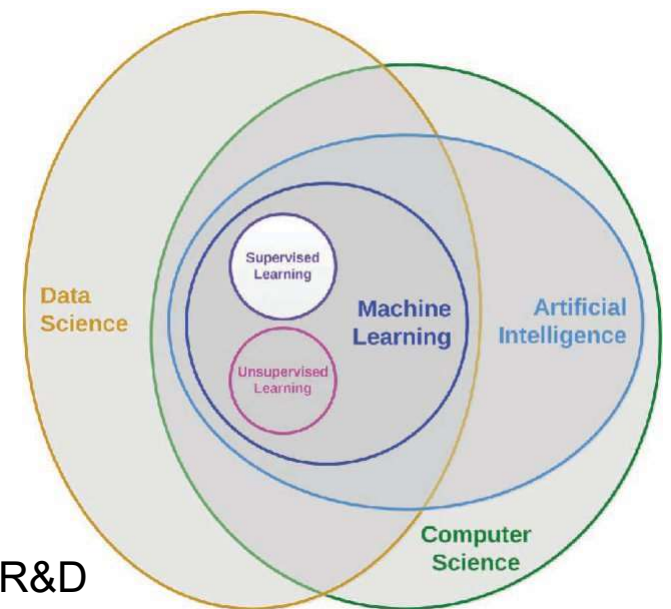


# Industry 4.0 and digitalization

- Artificial Intelligence (AI), Big Data, Data Science, Machine Learning, Chemometrics, Multivariate Data Analysis

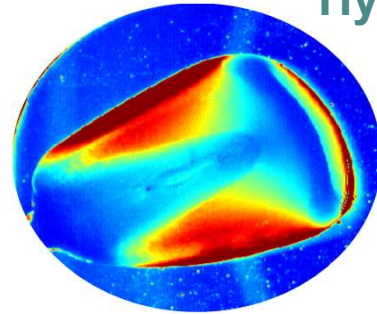
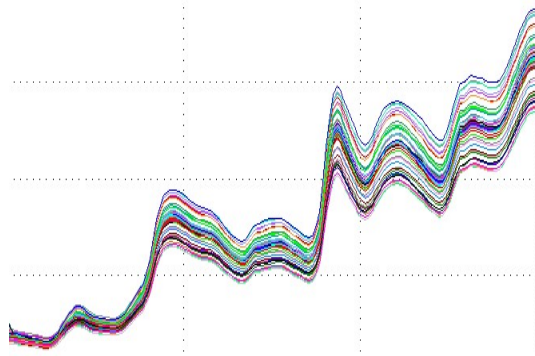
- Data-driven modeling for :

- Process **understanding** → data mining / R&D
- Process **optimization** → continuous improvement / R&D
- Process **monitoring** → alarms (early fault detection), fault diagnosis, predictive maintenance / Production
- Process **control** → Advanced Process Control (APC) / Production



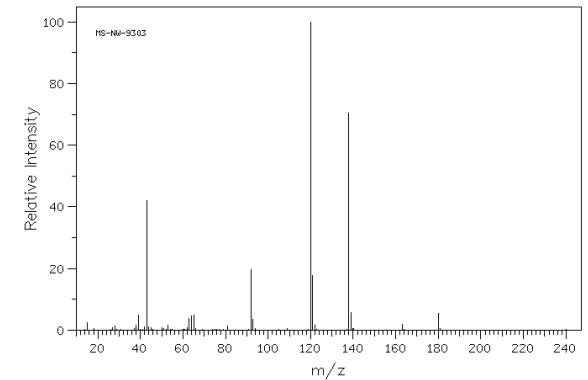
# Massive data available Big Data or Smart Data ?

**Spectroscopy**  
UV – Visible – NIR – FTIR  
Raman – Fluo – LIBS



**Hyperspectral Imaging**

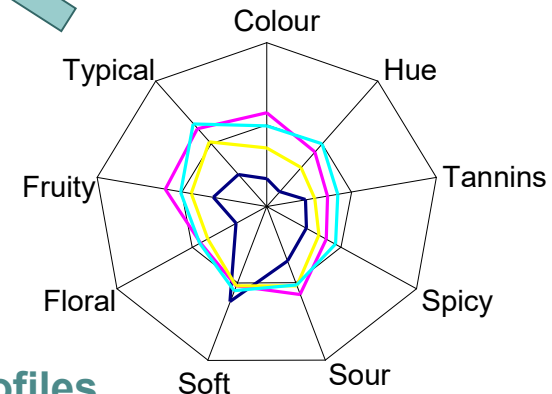
**Mass spectrometry**  
HPLC, GC...



**Product Process**

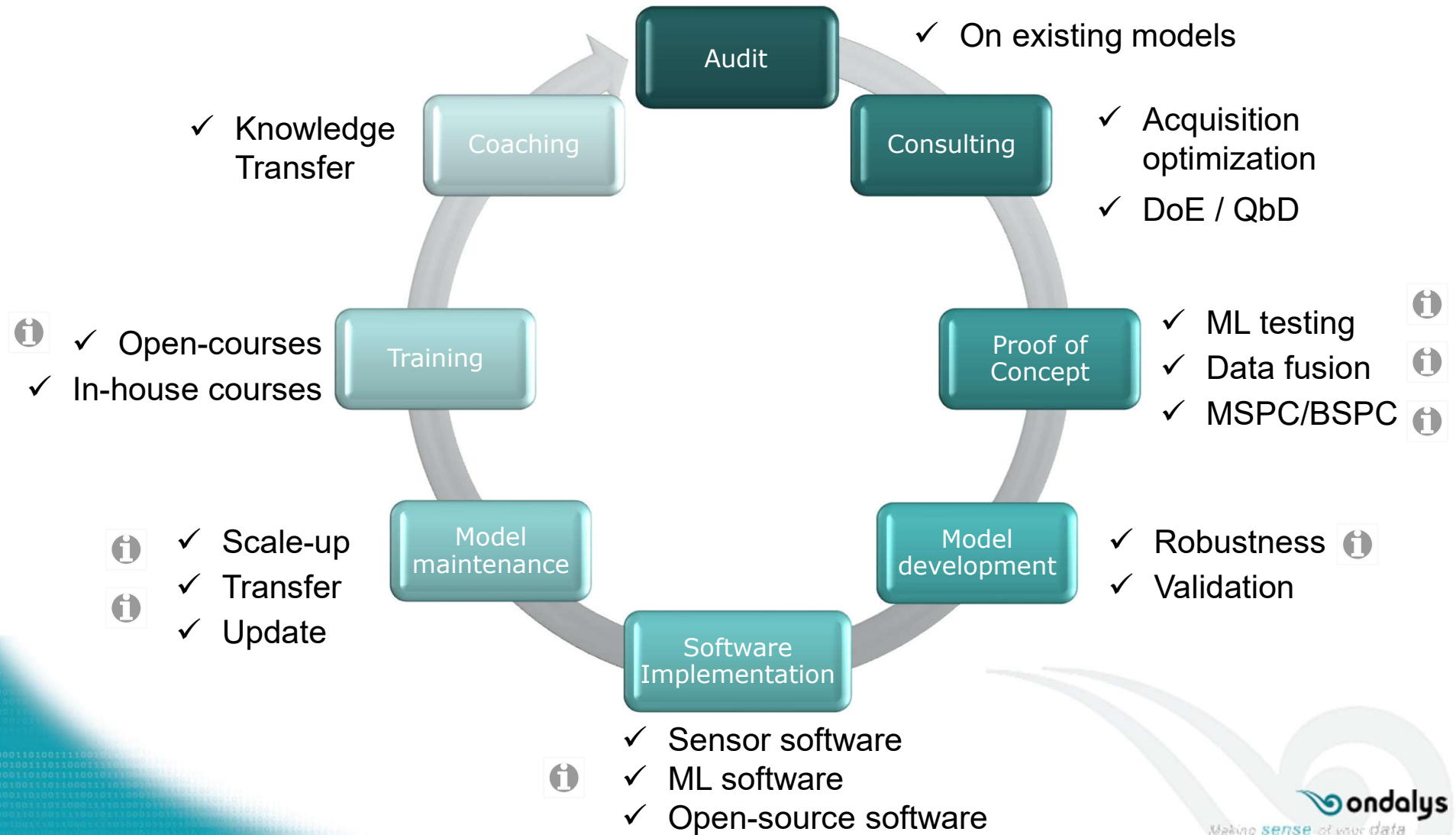
**Process parameters**

Time	pH	Temp (°C)	...
ID01	4.8	25	...
ID02	5.2	27	...
ID03	5.0	30	...
...	...	...	...



**Sensory profiles**

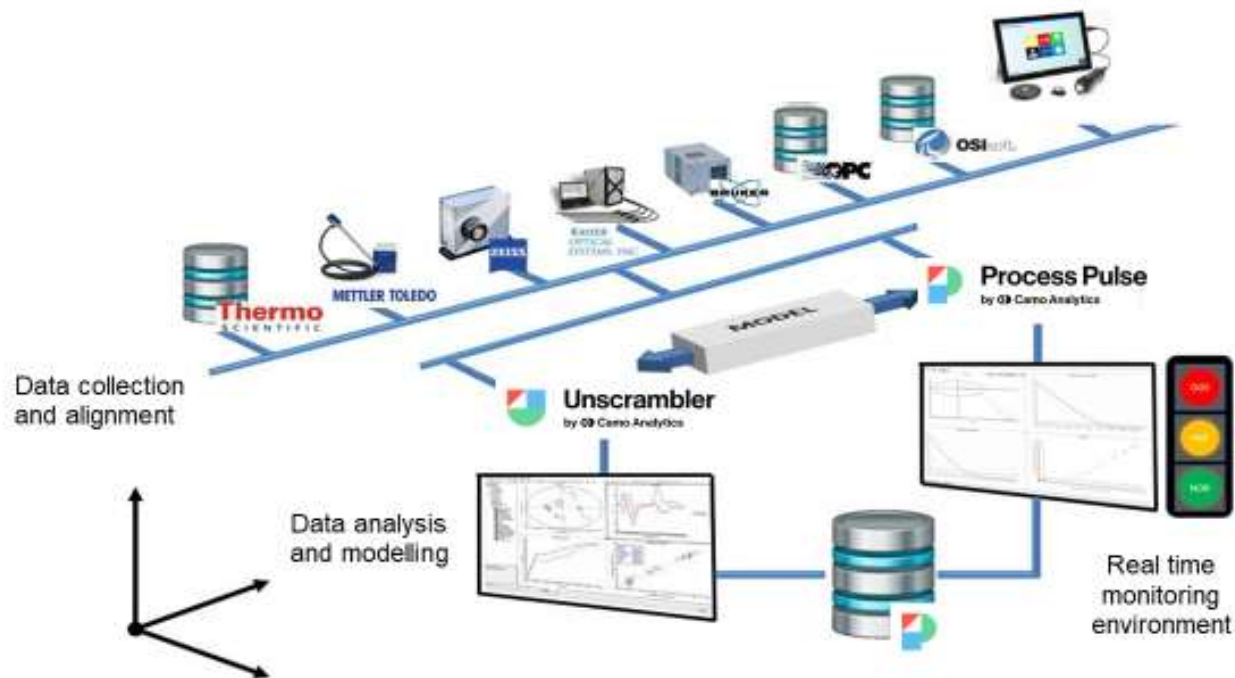
# A comprehensive offer in Lab and Industrial Data Analytics



# MSPC (Multivariate Statistical Process Control) BSPC (Batch Statistical Process Control)



System overview  
and interfaces

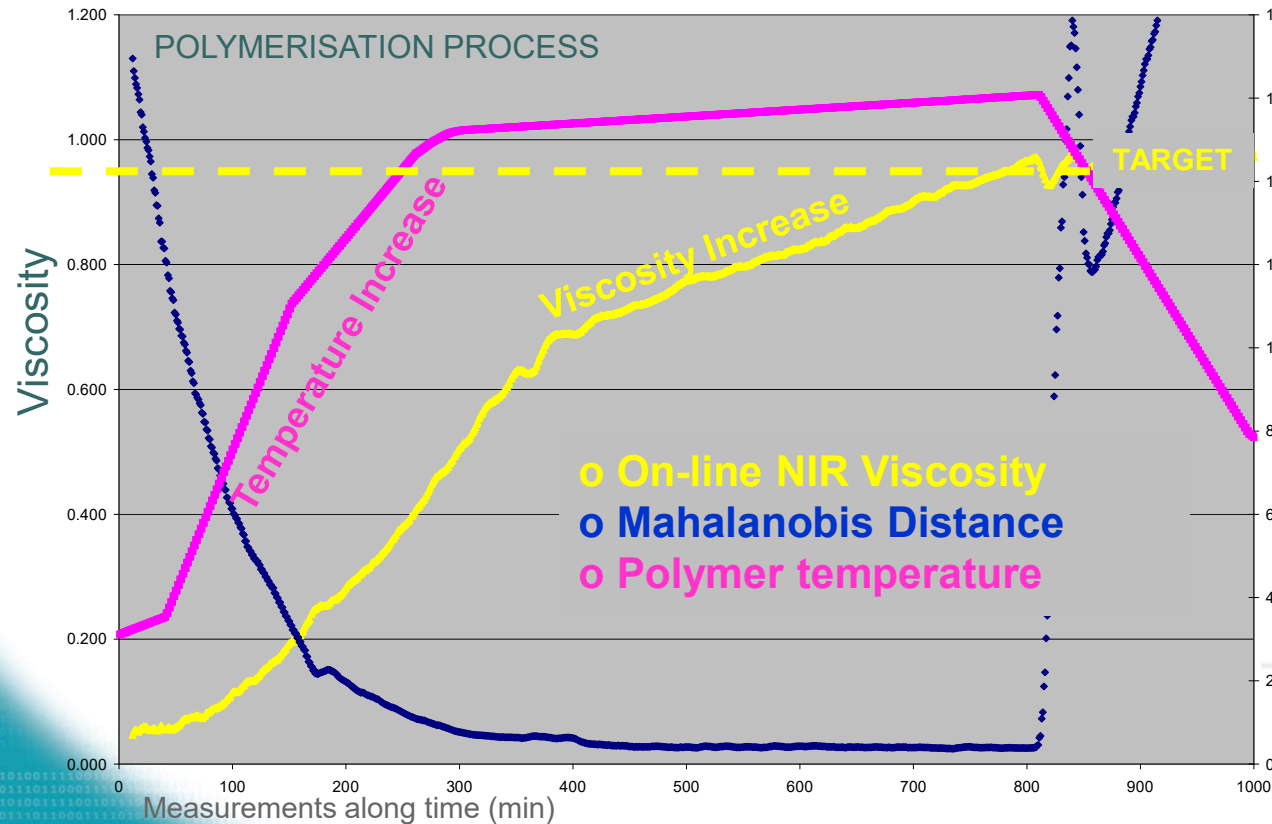


Software solution: Process Pulse II (Camo Analytics)

# End-point detection for batch process monitoring

## Polymerization monitoring and end-point detection

1. At-line NIR measurements
2. On-line NIR measurements



**ARKEMA**  
INNOVATIVE CHEMISTRY

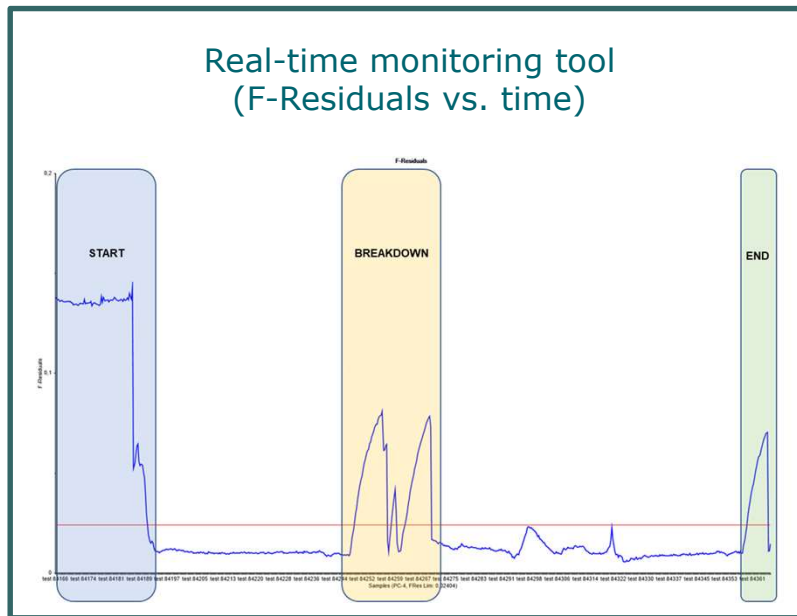
ondalys

Perrine HEBERT, Jordane LALLEMAND, Safia MONTAGNIER, Jean GUILMENT and Sylvie ROUSSEL.

Orthogonalization Method For Robustness Improvement Of On-line NIR Applications. ICNIRS2017, Copenhagen, June 2017. [use of your data](#)

# Process monitoring for continuous processes

- Monitoring and fault diagnosis
- On-line Raman probe for silicone polymer process



 **Process Pulse®**  
by  Camo Analytics

 **Elkem**  
A Bluestar Company

 **AxelOne** | La plateforme  
d'innovation collaborative  
Chimie-Environnement

*Sébastien PREYS, Alexis ZENNER, Florine GAULIER, Perrine HEBERT. From complex real-world data to process understanding and monitoring, a use case in the chemical industry. Chimiométrie 2020, Liège, January 2020.*

 **ondalys**  
Making sense of your data



Making sense of your data...

*Donnez du sens à vos données*



based on Data Analytics  
for industrial measurements

Sébastien PREYS, *Ph.D.*

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