From crop fields to baker's shop, data science at every step

Pr Yves Brostaux, Uliège

Cereals & Grains 18, London

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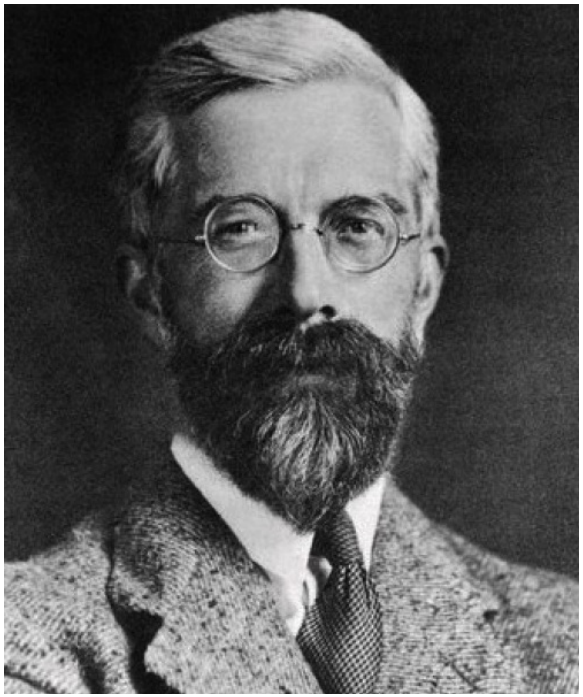

Ronald A. Fisher
(1890-1962)

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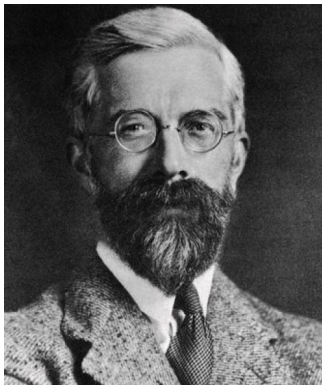
The beginning



Ronald A. Fisher
(1890-1962)

Rothamsted Experimental Station (1919-1933)

ROTHAMSTED
RESEARCH

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In the fields

Lattice designs (1936)

Split-plot designs

Partially Balanced Incomplete Block (PBIB) designs

Split-block designs

Alpha designs (1978)

Resolvable Incomplete Block designs

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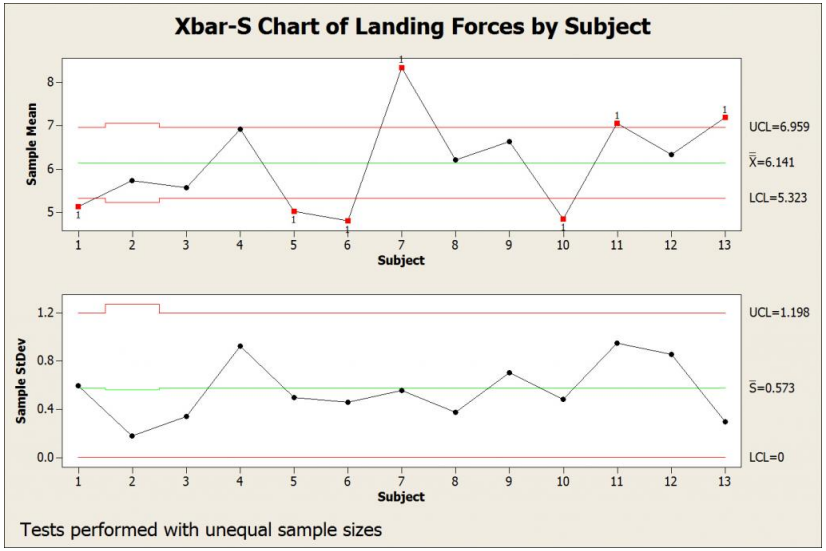
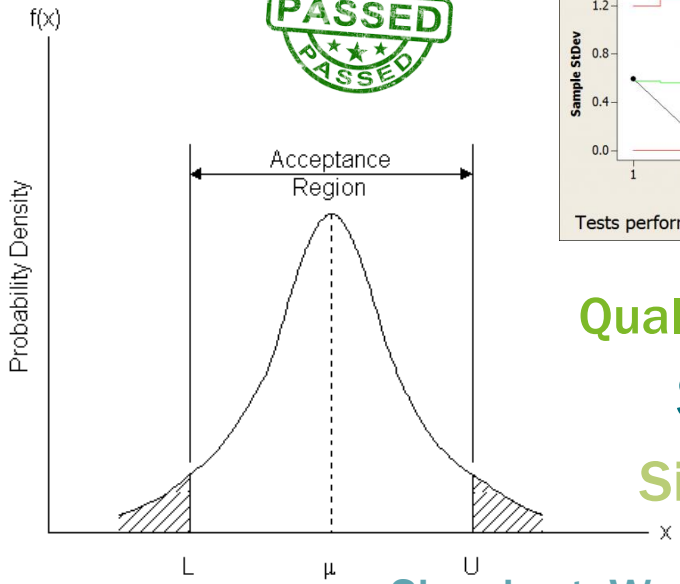
Meanwhile, in the industry...

Process Capability Index

Control Charts





Quality Control upon Reception

Statistical Quality Control

Six Sigma

Shewhart, W. A. (1931)

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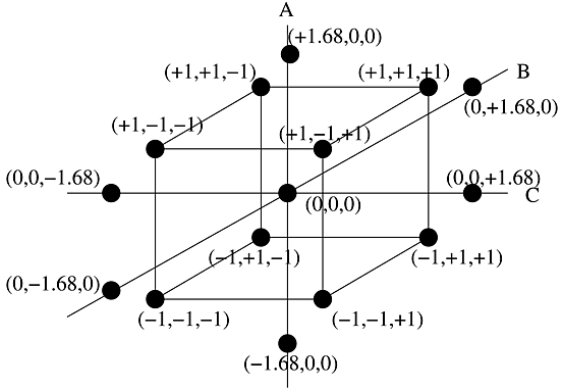
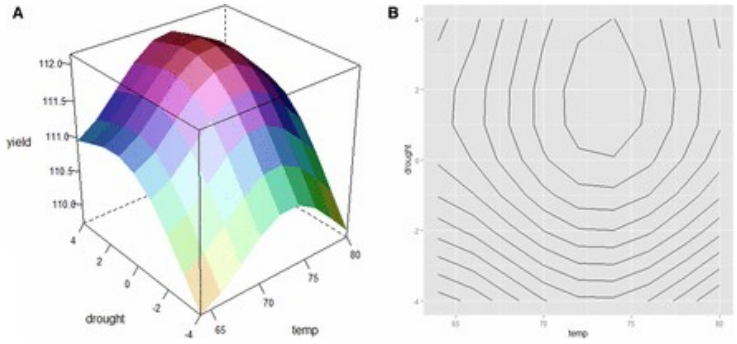
Meanwhile, in the industry…

Packett-Burman designs (1946)

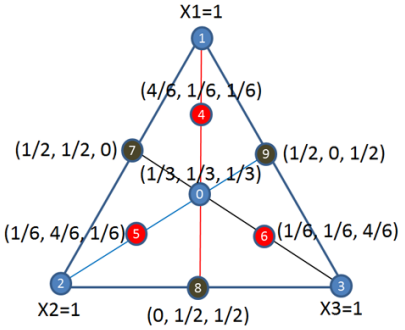
Tagushi Robust Design Strategy (1950's)





Response Surface Methods (Box & Wilson, 1951)

Mixture designs (Snee & Marquardt, 1976)



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… and on the consumer side

Profiling tests

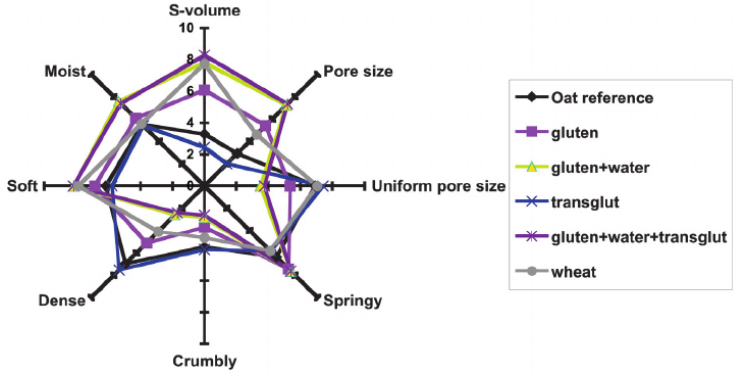
Hedonic analysis

Ranking tests

Differentiation tests

Napping

Triangle tests



Sensory analysis

Cairncross, S. E., & Sjostrom, L. B. (1950)

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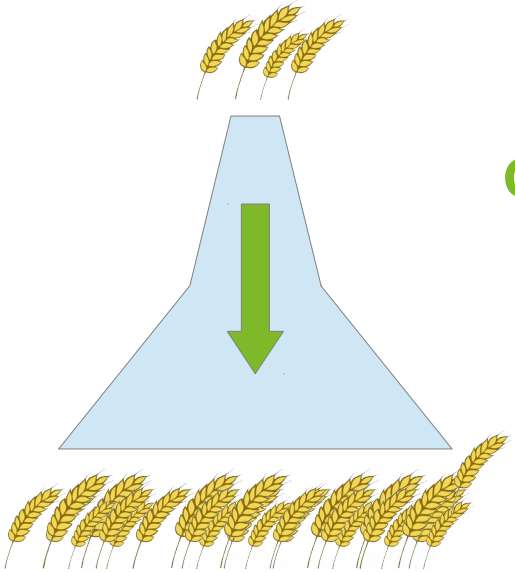
The classical inference paradigm

- Infer properties of a population, based on the observation of a sample of individuals
- Useful when data are *s c a r c e*



"From the few, thou shall conclude about the many"

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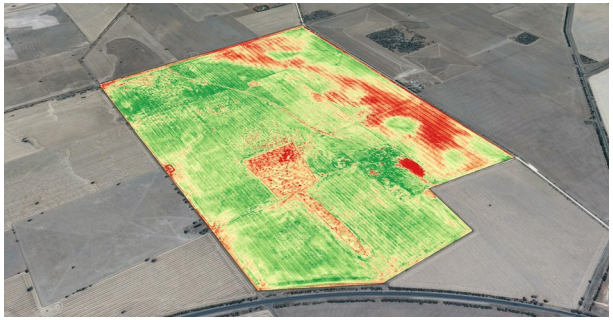
2000's, the rise of the machines

GPS devices

UAV imagery



Remote sensing

Smart Farming

Satellite imagery

Spatial data analysis

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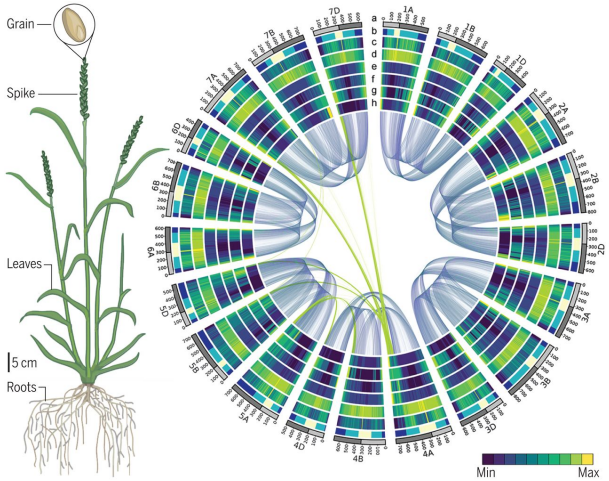
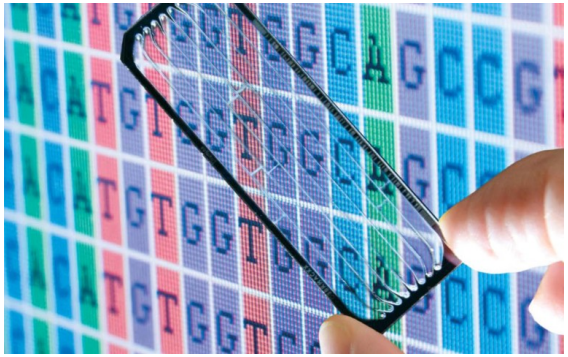
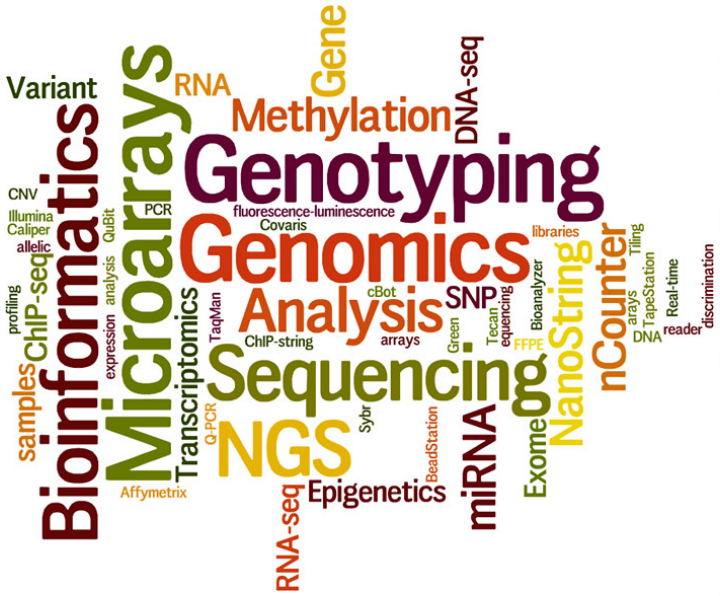
2000's, the rise of the machines



Reference genome of wheat (2018)





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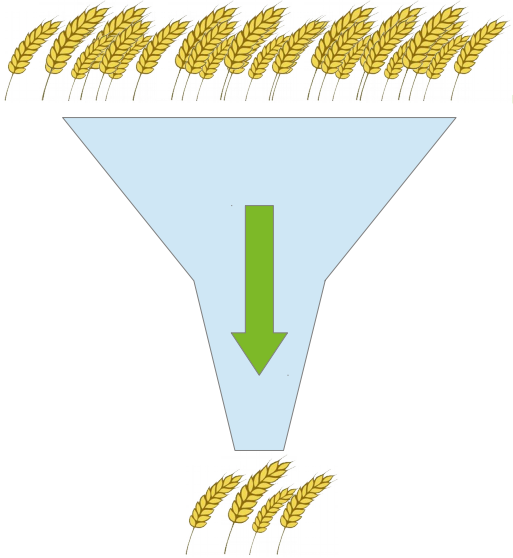
Here comes the Big Data

- Paradigm inversion on classical inference
- Refine useful information from huge amount of data



“From the many, thou shall find the chosen ones”

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What's next ?

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