

Machine Learning

ML. 0 Organization

David Ríos Insua and Roi Naveiro

Basic info

- Instructors

David Ríos Insua david.rios@icmat.es

Roi Naveiro roi.naveiro@icmat.es

Nuria Campillo

Chema Camacho

- Materials

<https://github.com/roinaveiro/curso-ml-JAE>

<https://roinaveiro.github.io/curso-ml-JAE/>

Machine learning

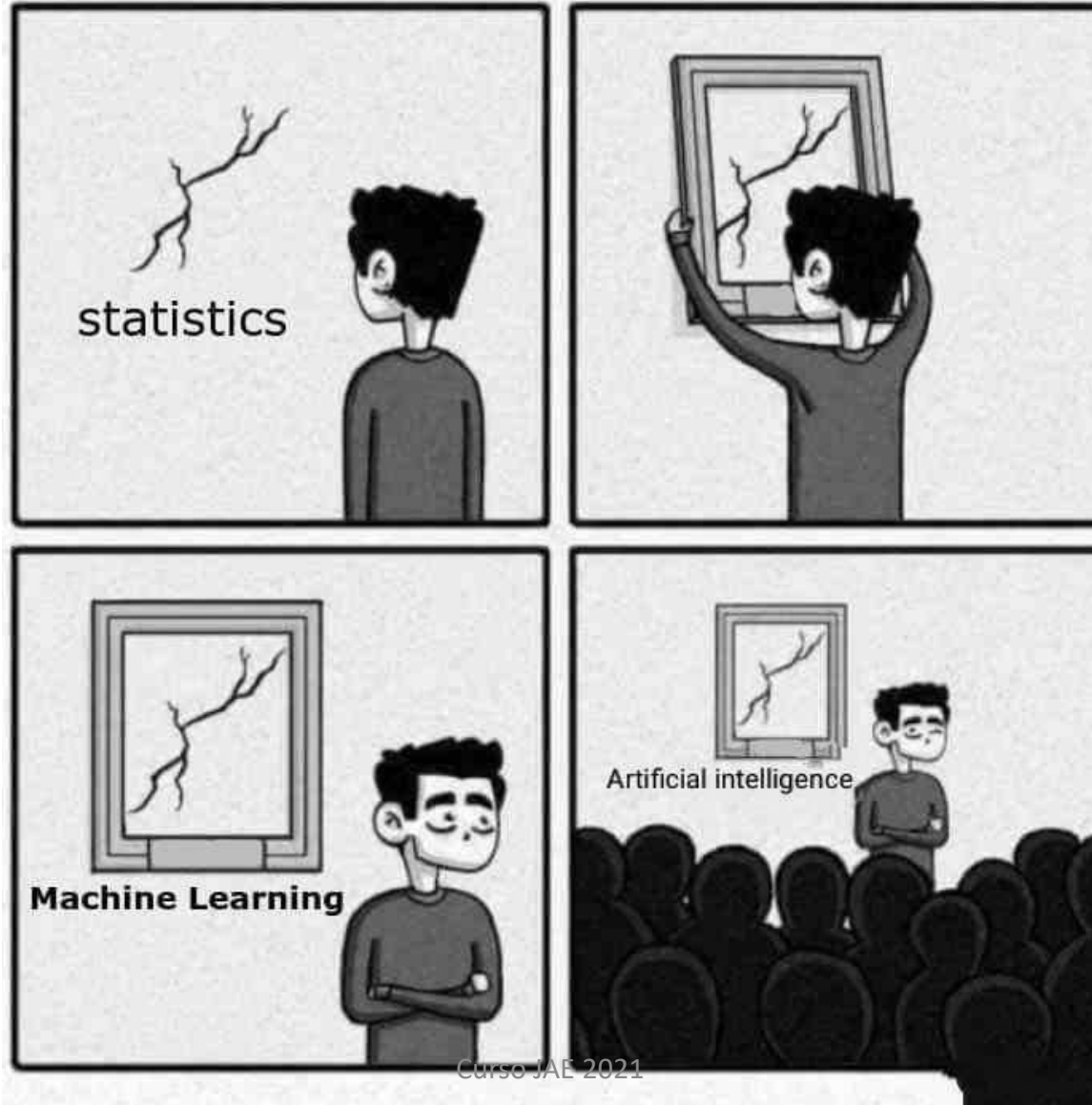
A computer program learns from experience E with respect to class T of tasks and performance measure P

if

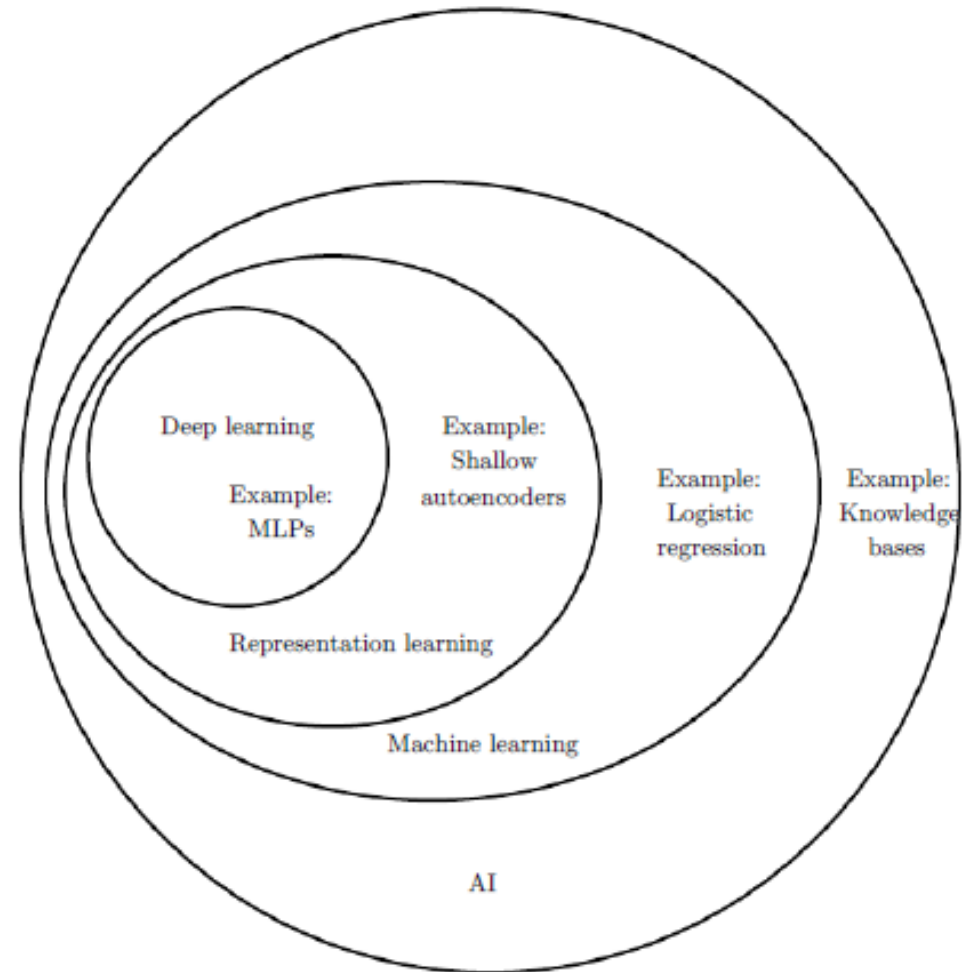
Its behaviour with respect to task T , measured according to P , improves with experience E

Representation-Evaluation-Optimization

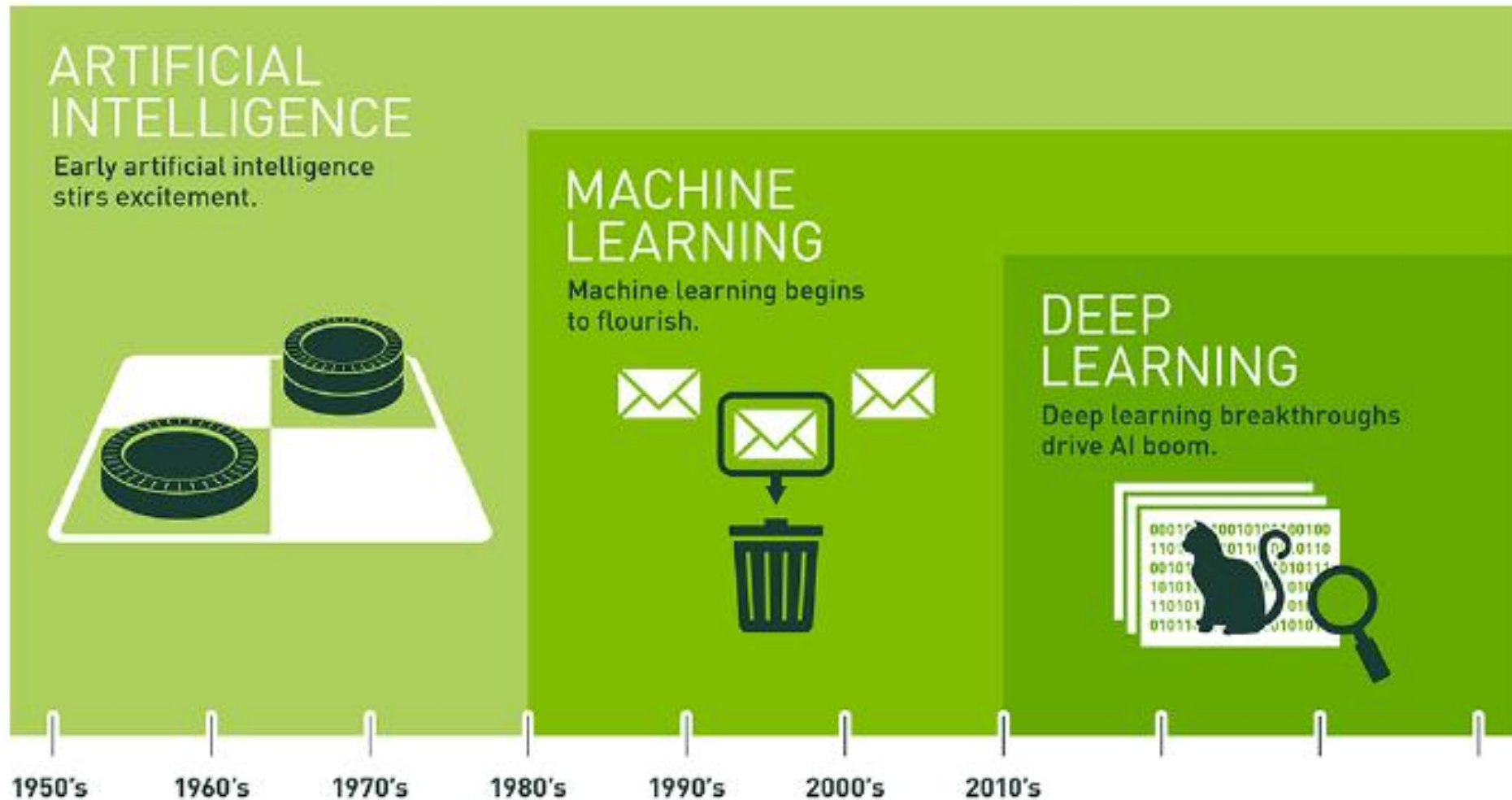
Stats vs Machine Learning?



Stats vs Machine Learning?



An evolution....



Contents

1. Overview+R
2. Supervised learning+R
3. Unsupervised learning+R
4. Reinforcement learning+R+Some research issues

Course on Bayesian methods in AI

ML and Statistics

- J. Friedman. Data Mining and Statistics, What's the connection (1998)
- L. Breiman. Statistical Modeling,. The two cultures (2001)
- Cross Validated. What's the difference between data mining, statistics, machine learning and AI (2010)
- S.D. Sekar What's the difference between Artificial Intelligence, Machine Learning, Statistics and Big Data (2014)
- Cross Validated. What exactly is Big Data? (2015)
- David Donoho. 50 years of data science (2015)
- B. Efron, T. Hastie. Computer Age Statistical Inference (2016)
- **D. Dunson Statistics in the Big Data era: Failures of the Machine (2019)**
- D. Spiegelhalter The Art of Statistics (2020)

Basic bibliography

- Efron, Hastie (2017) Computer Age Statistical Inference. Cambridge UP
- Goodfellow, Bengio, Courville (2017) Deep Learning, MIT Press.
- James, Hastie, Witten, Tibshirani (2013) An introduction to Statistical Learning. Springer.
- Sutton, Barto (2018) Reinforcement learning: An introduction, MIT Press.

ML and R

- Chollet (2018) Deep Learning with R, Manning.
- Ciaburro (2020) Reinforcement Learning with R, Packt