



CHALLENGE

The PostDocs team

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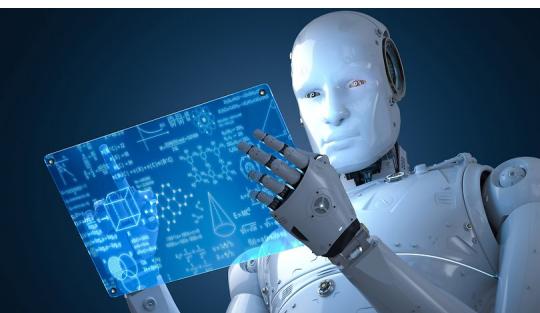
THE PROBLEM

Improve “money laundry”
detection system.



Yes, I've just
transferred
20000 CHF to
Afghanistan 😊

OUR APPROACH



Let your data speak:
ML approach



Improve the prediction with human expert knowledge



But what about the future?

ML APPROACH

UNSUPERVISED:

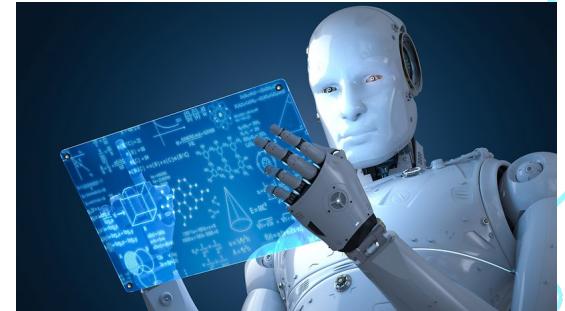
INSIGHTS FROM DATA

- Frequency analysis of the features: the datasets are imbalanced (!)
- Clustering
- Embeddings and visualization

SUPERVISED:

MAXIMIZE PREDICTION ACCURACY

- Balance the data
(oversampling and undersampling)
- Choose the best classifier
(Gradient boosting decision trees)
- Analyze feature importance
(permutation feature index)



INSIGHTS FROM ML APPROACH

UNSUPERVISED:

INSIGHTS FROM DATA

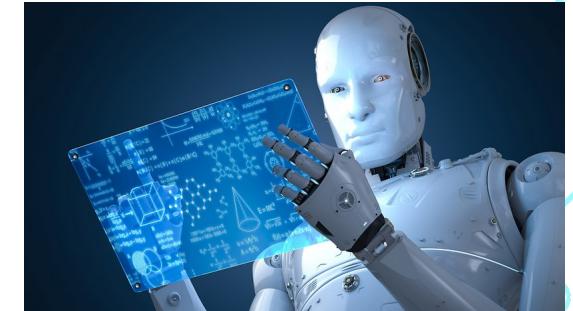
To detect fraudulent individuals we can use feature “individual/company” as labels.

If the individual predicted as a company, he/she performs suspicious activity.

SUPERVISED:

MOST IMPORTANT FEATURES

- Turnover
- Atm_deposit
- Atm_withdrawal
- Transaction_count
- lo_ratio
- Age
- Inactive_days_average



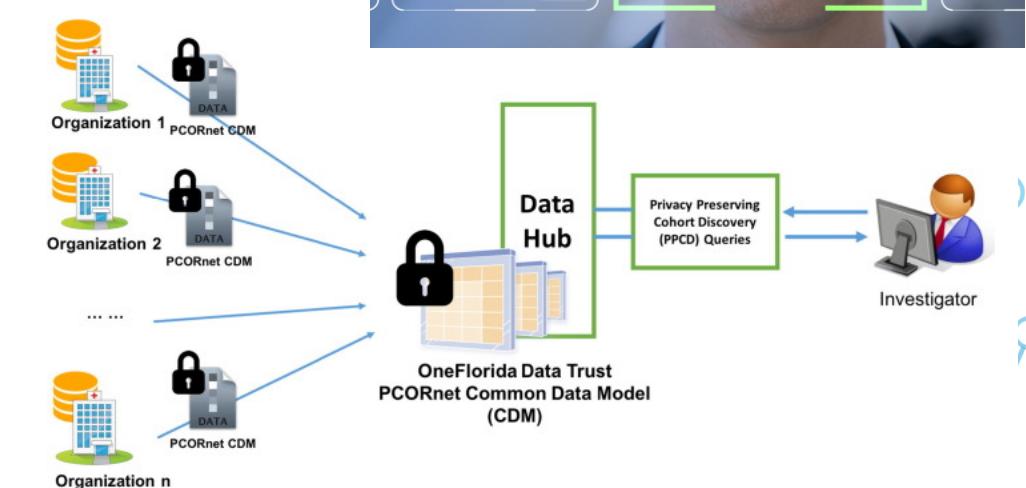
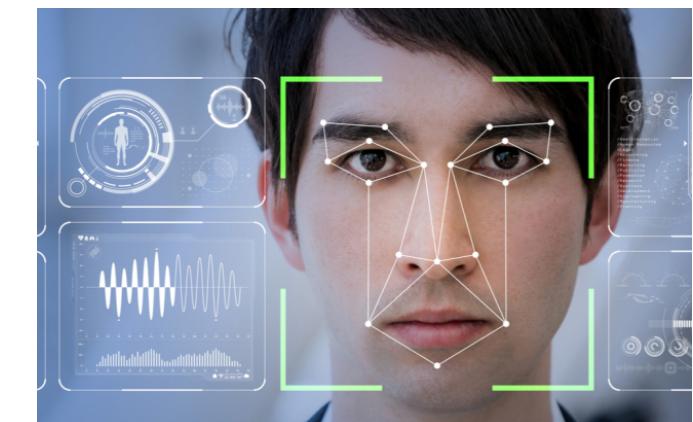
IS THE DATA ENOUGH?



- Name of the country/city where transactions with ATM take place
- Name of the destination places of money transfer (terrorism, war)
- Mobile data (locations and movements)
- Date of the money transfer (elections, conflicts, natural disasters)
- Social networks

MONEY LAUNDRY DETECTION IN THE FUTURE

- More international legal control on bitcoins' operations
- ATM face/fingerprint detection
- Distributed Privacy Preserving Information sharing with blockchain
- Improve ML detection algorithms:
 - Advanced balancing algorithms
 - Deep Reinforcement Learning



TAKE HOME MESSAGE

- Be careful with algorithms and unbalanced data.
Chose wisely!
- Think beyond the data, e.g. follow political situation, technology, etc.
- Think of the future, be one step ahead. Follow the technology advances.