

Real-Time Predictions on the Factory Floor

MATE GULYAS
20MIN



Spark Summit EU

Intro



INDUSTRY 4.0



HISTORY



MECHANISATION

~1800



**MASS
PRODUCTION**

1870



AUTOMATION

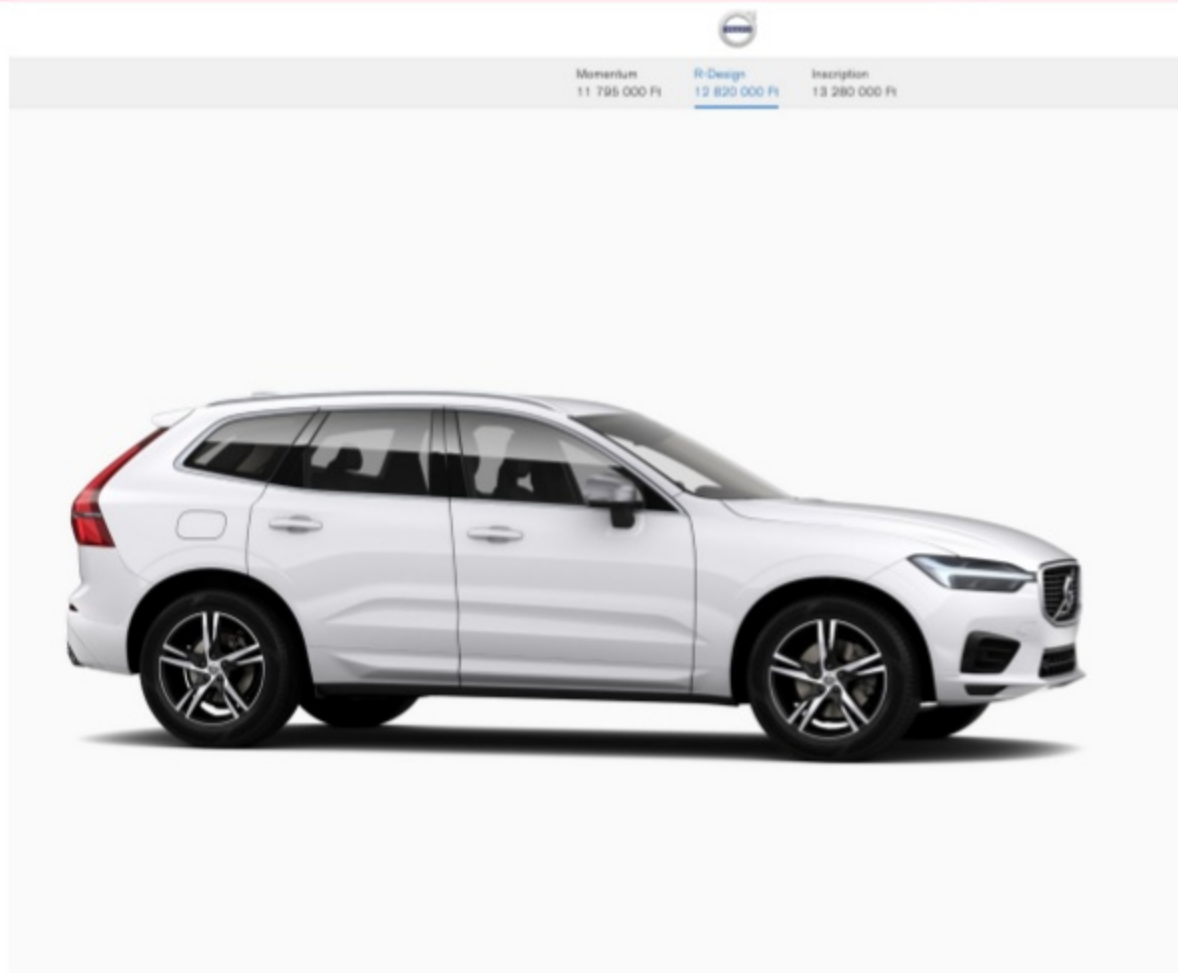
1969



**SMART
FACTORIES**

2014-

MASS CUSTOMISATION




EXAMPLES



MASS CUSTOMISATION

Válasszon motort a modelhez XC60 R-Design



T5 T5 (250LE) 8 sebességű automata Geartronic  15 620 000 Ft 

CO2 166 g/km	Sebességű Automata	Fogyasztás 7.1 l/100km	Üzemanyag Benzin	Telj. 250 LE	Kiválasztás
--------------------	-----------------------	------------------------------	---------------------	--------------------	-----------------------------

T5 T5 (250LE) 8 sebességű AWD automata Geartronic  16 370 000 Ft 

CO2 169 g/km	Sebességű Automata	Fogyasztás 7.3 l/100km	Üzemanyag Benzin	Telj. 250 LE	Kiválasztás
--------------------	-----------------------	------------------------------	---------------------	--------------------	-----------------------------

T6 T6 (310LE) 8 sebességű AWD automata Geartronic  17 370 000 Ft 

CO2 174 g/km	Sebességű Automata	Fogyasztás 7.5 l/100km	Üzemanyag Benzin	Telj. 310 LE	Kiválasztás
--------------------	-----------------------	------------------------------	---------------------	--------------------	-----------------------------

T8 T8 TWIN ENGINE AWD (390LE) 8 sebességű automata Geartronic  20 495 000 Ft 

CO2 50 g/km	Sebességű Automata	Fogyasztás 2.2 l/100km	Üzemanyag Hibrid	Telj. 390 LE	Kiválasztás
-------------------	-----------------------	------------------------------	---------------------	--------------------	-----------------------------

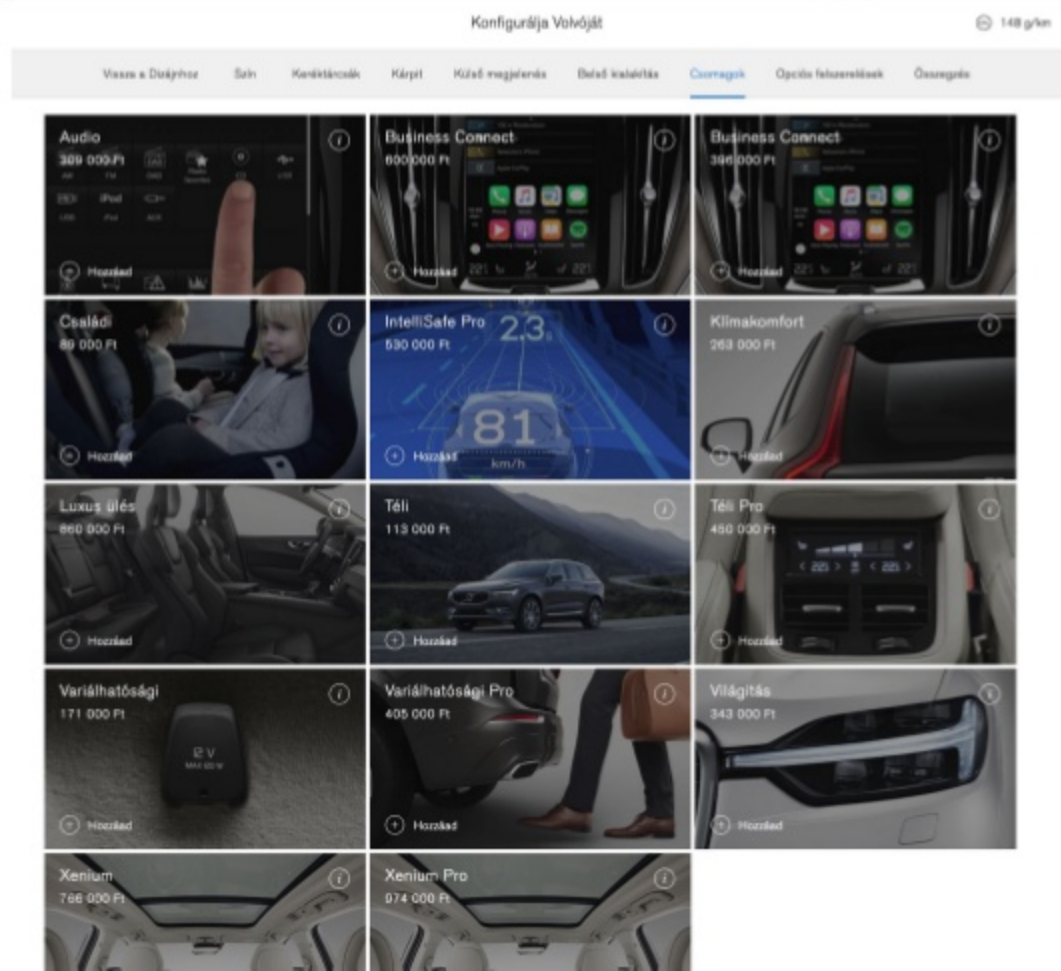
D3 D3 (150LE) 6 sebességű manuális  12 820 000 Ft 

CO2 121 g/km	Sebességű Manuális	Fogyasztás 5.0 l/100km	Üzemanyag Benzin	Telj. 150 LE	Kiválasztás
--------------------	-----------------------	------------------------------	---------------------	--------------------	-----------------------------

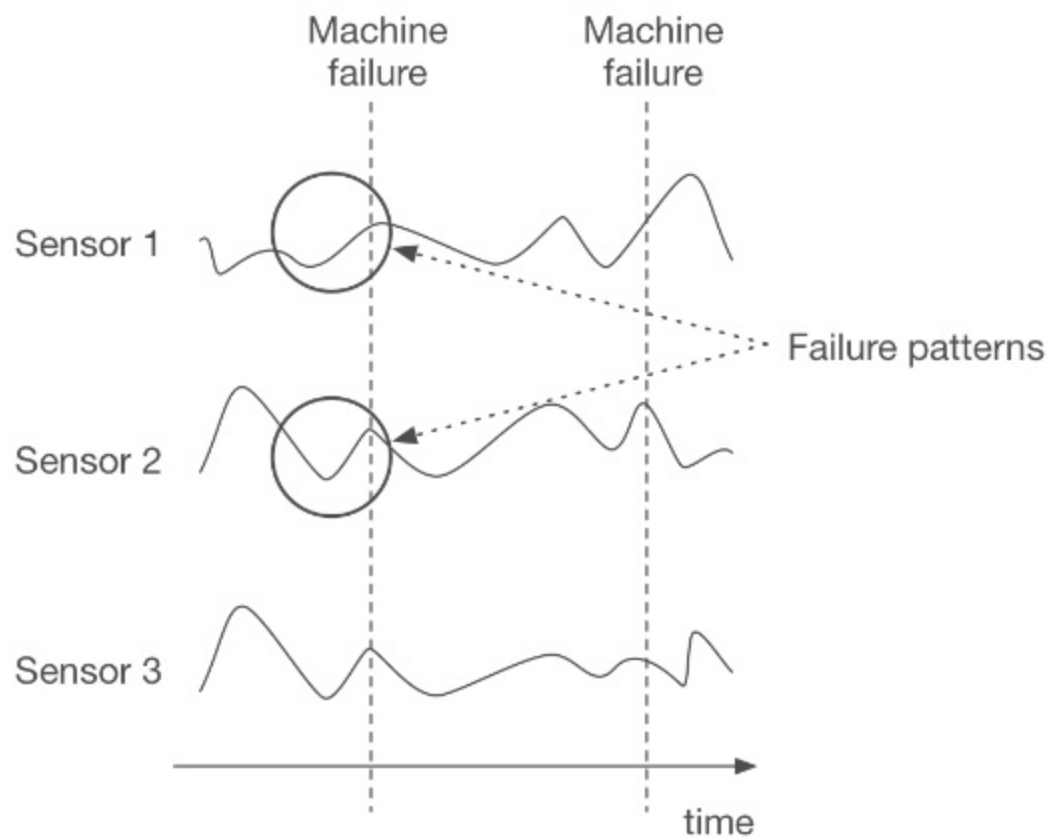
EXAMPLES



MASS CUSTOMISATION



PREDICTIVE MAINTENANCE



CHALLENGES



ACTUAL BIG DATA

200 ms /

32 byte

** 200 sensors*

** 20 measurements*

*200 ms / 32 byte * 200 sensors * 20 measurements*

**ACTUAL
BIG DATA**

0.61 MB / sec

2 GB / hour

360 GB / week

18.7 TB / year

*200 ms / 32 byte * 200 sensors * 20 measurements*

18.7 TB / year

**ACTUAL
BIG DATA**

5 years retention

93.7 TB

fixed dataset size

***ALSO, IT'S NOT JUST
THE SIZE...***

LATENCY



100-200ms



100-200ms



TOTAL
200-600ms

TECHNOLOGIES



*EVERY TECHNOLOGY
EXISTS ALREADY!*

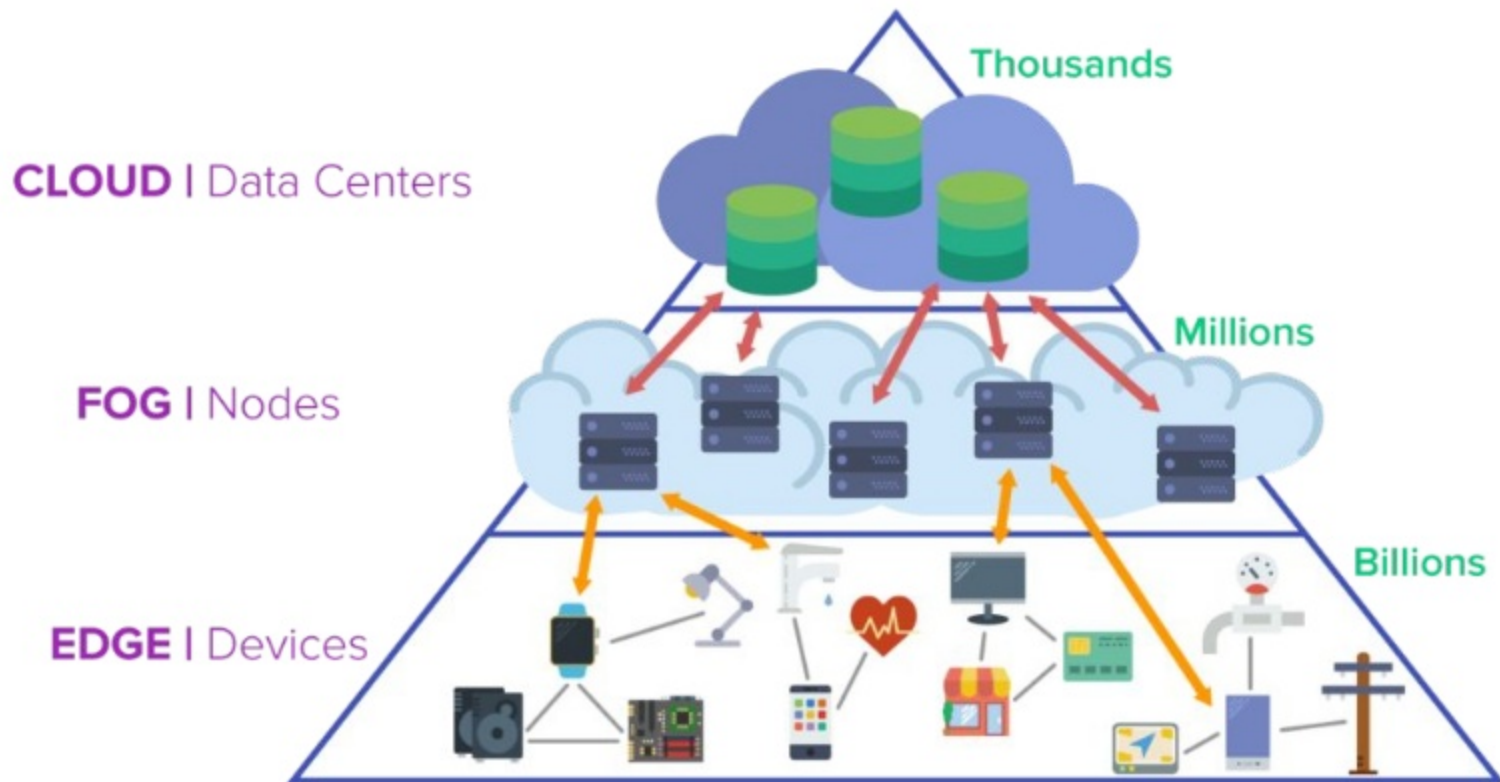
EVERY TECHNOLOGY EXISTS
ALREADY!



FOG COMPUTING

EDGE COMPUTING

FOG COMPUTING



LATENCY



100-200ms



100-200ms



TOTAL
200-600ms

LATENCY

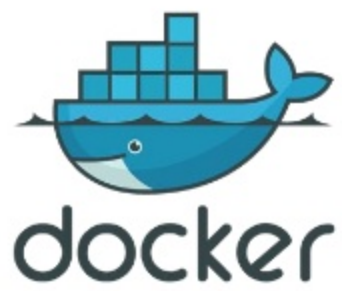


TOTAL
(to response)

50 ms

EDGE COMPUTING

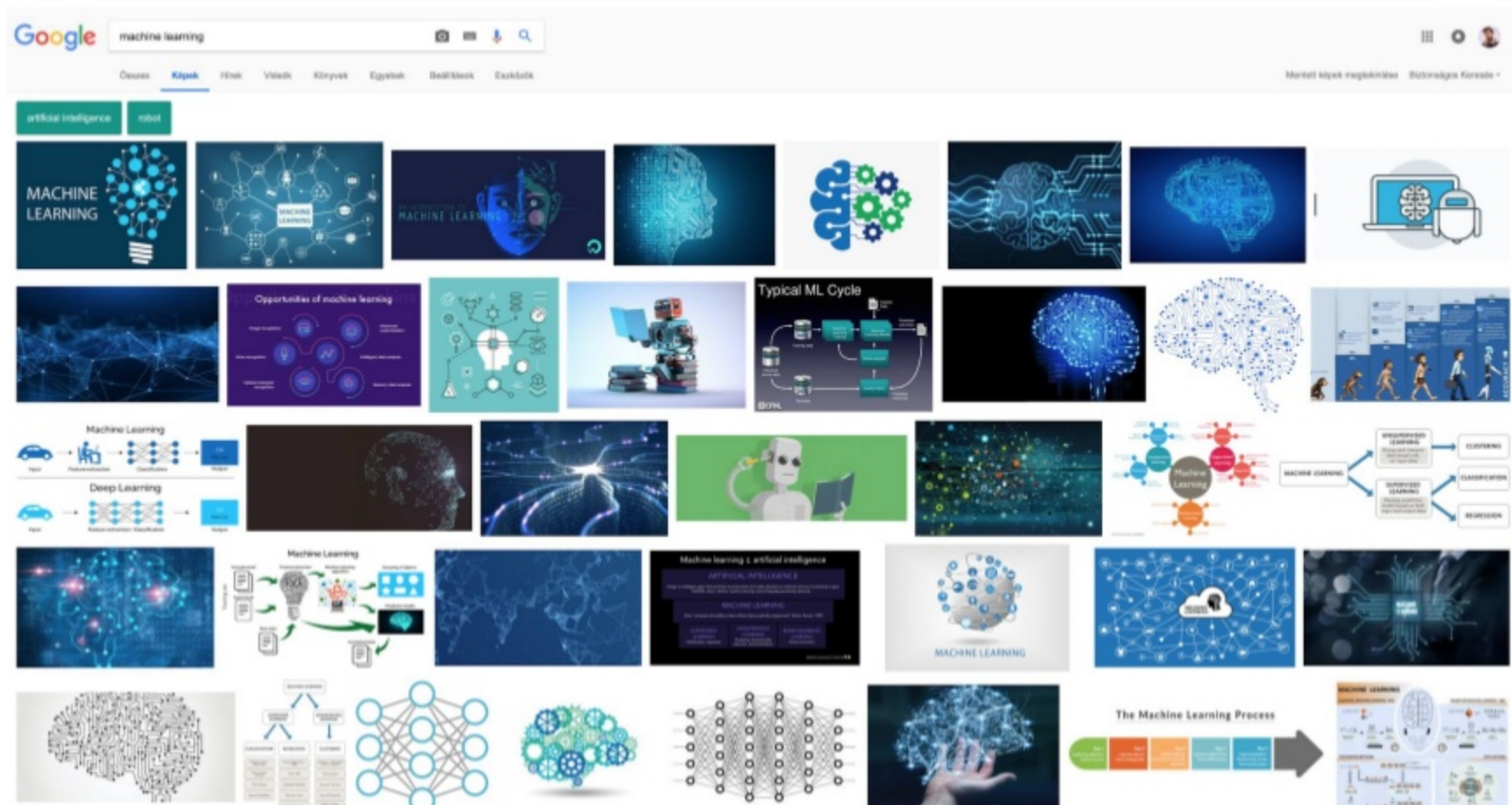


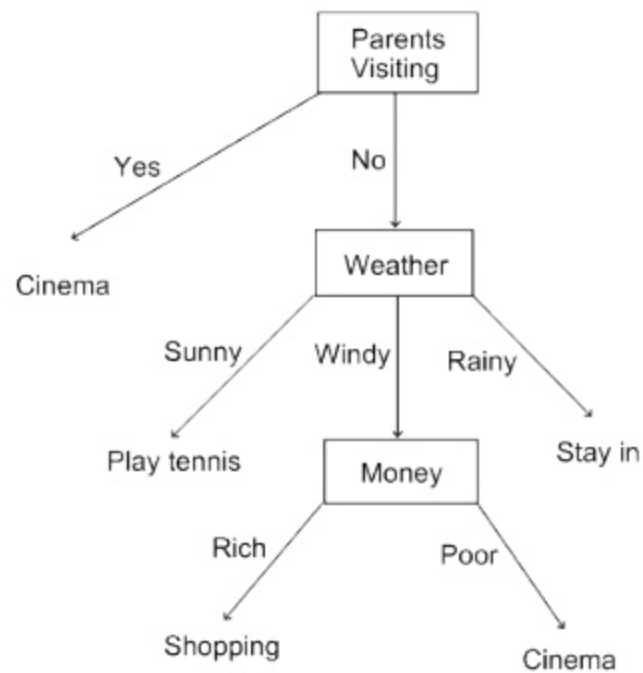
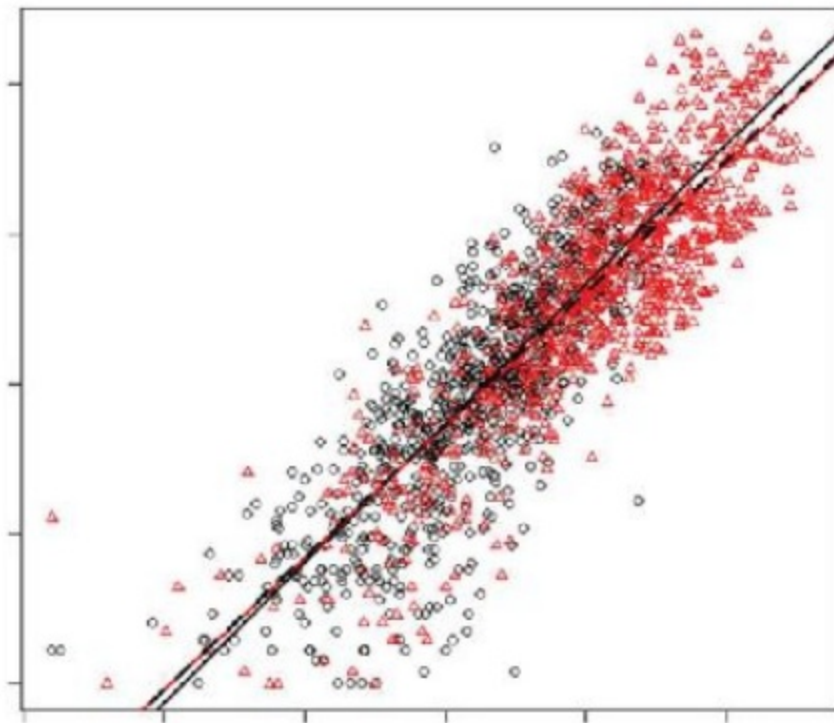


BEST PRACTICES



EDUCATION





CURRENT TECHNOLOGICAL CHALLENGES



PROBLEM 1



MACHINE LEARNING LIFECYCLE

PROBLEM 2



COLLECTING GOOD DATA

PROBLEM 3



*STATEFUL
STRUCTURED
STREAMING*

PROBLEM 4



EXPLAINABLE MODELS



DISCOVER TOGETHER

Email

gulyasm@datapao.com

Twitter

[@gulyasm](https://twitter.com/gulyasm)

Linkedin

linkedin.com/in/gulyasm



[@datapao](https://twitter.com/datapao)



datapao.com



DISCOVER TOGETHER

PING ME!

gulyasm@datapao.com



THANK YOU!



@datapao



datapao.com