FORNAX

How to win Kaggle competitions?

A handful of Machine Learning tips

by Rafał Cycoń

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kaggle | Search kaggle | Competitions | Datasets | Kernels | Discussion | Jobs | •••

Competitions

12 active competitions

Sort by Prize

Active | All | Entered | Hosted | All Categories | Search

Zillow Prize: Zillow's Home Value Prediction (Zestimate)
Can you improve the algorithm that changed the world of real estate?
Featured · 8 months to go
$1,200,000
271 teams

Intel & MobileODT Cervical Cancer Screening
Which cancer treatment will be most effective?
Featured · 25 days to go
$100,000
691 teams

Google Cloud & YouTube-8M Video Understanding Challenge
Can you produce the best video tag predictions?
Featured · 6 days to go
$100,000
633 teams

Planet: Understanding the Amazon from Space
Use satellite data to track the human footprint in the Amazon rainforest
Featured · 2 months to go
$60,000
294 teams

Instacart Market Basket Analysis
Which products will an Instacart consumer purchase again?
Featured · 3 months to go
$25,000
328 teams

Rafal Cycon (blaine)

CTO at fornax.ai
Poland
Joined 3 years ago · last seen in the past day
http://fornax.ai

Home | Competitions (11) | Kernels (0) | Discussion (23) | Datasets (2) | More

Competitions Master

Current Rank	Highest Rank
204 of 57,910	30

3	3	2

Grasp-and-Lift EEG Detec... · 2 years ago · Top 1%	1st of 379
BCI Challenge @ NER 2015 · 2 years ago · Top 1%	1st of 260
Allstate Purchase Predicti... · 3 years ago · Top 1%	10th of 1568

Kernels Contributor

Unranked

0	0	0

No kernel results

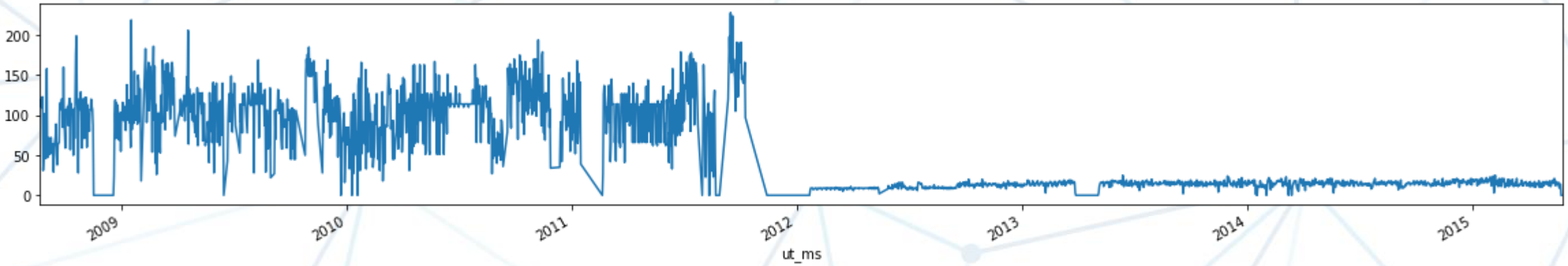
Know your data

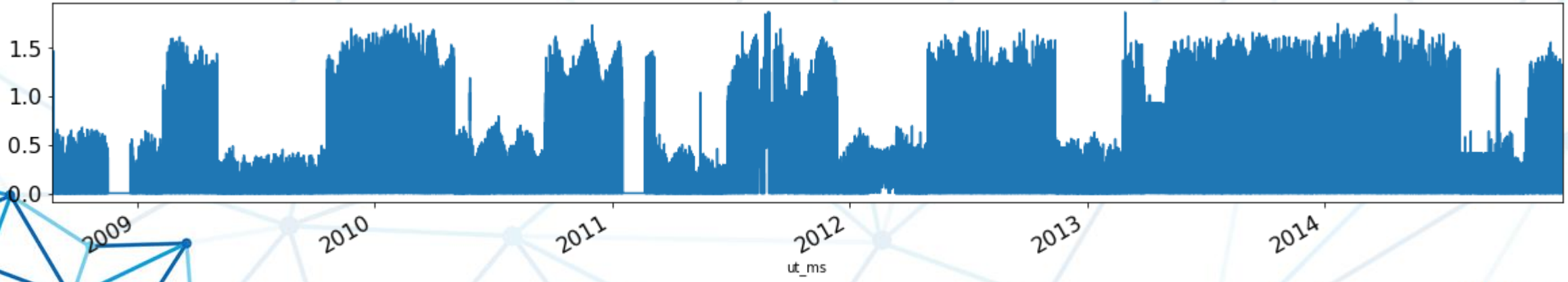
- Have a look on features
- Look on the target variable(s)
- Check for outliers
- Normalize where necessary

- Plot things and statistics

Know your data

MEX

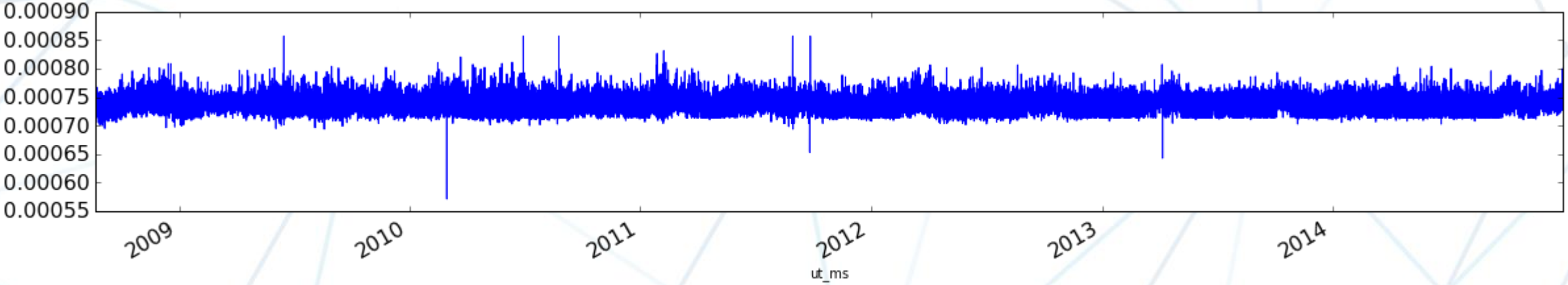


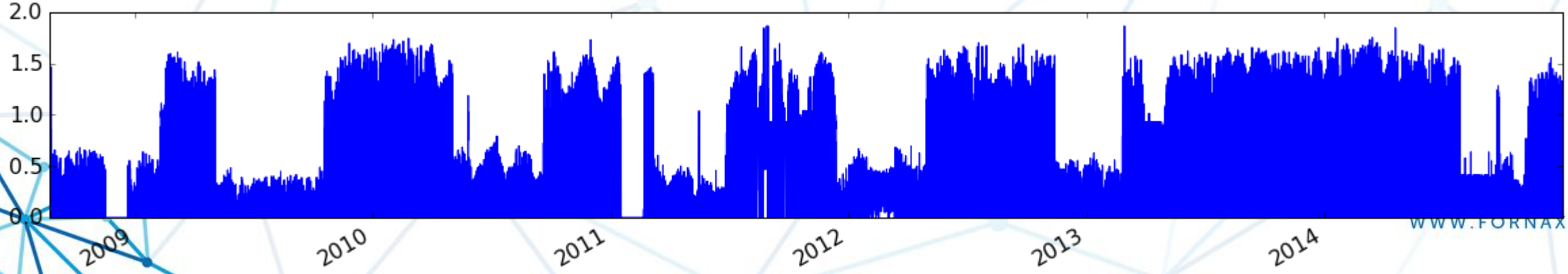


Know your metric...

...and understand it

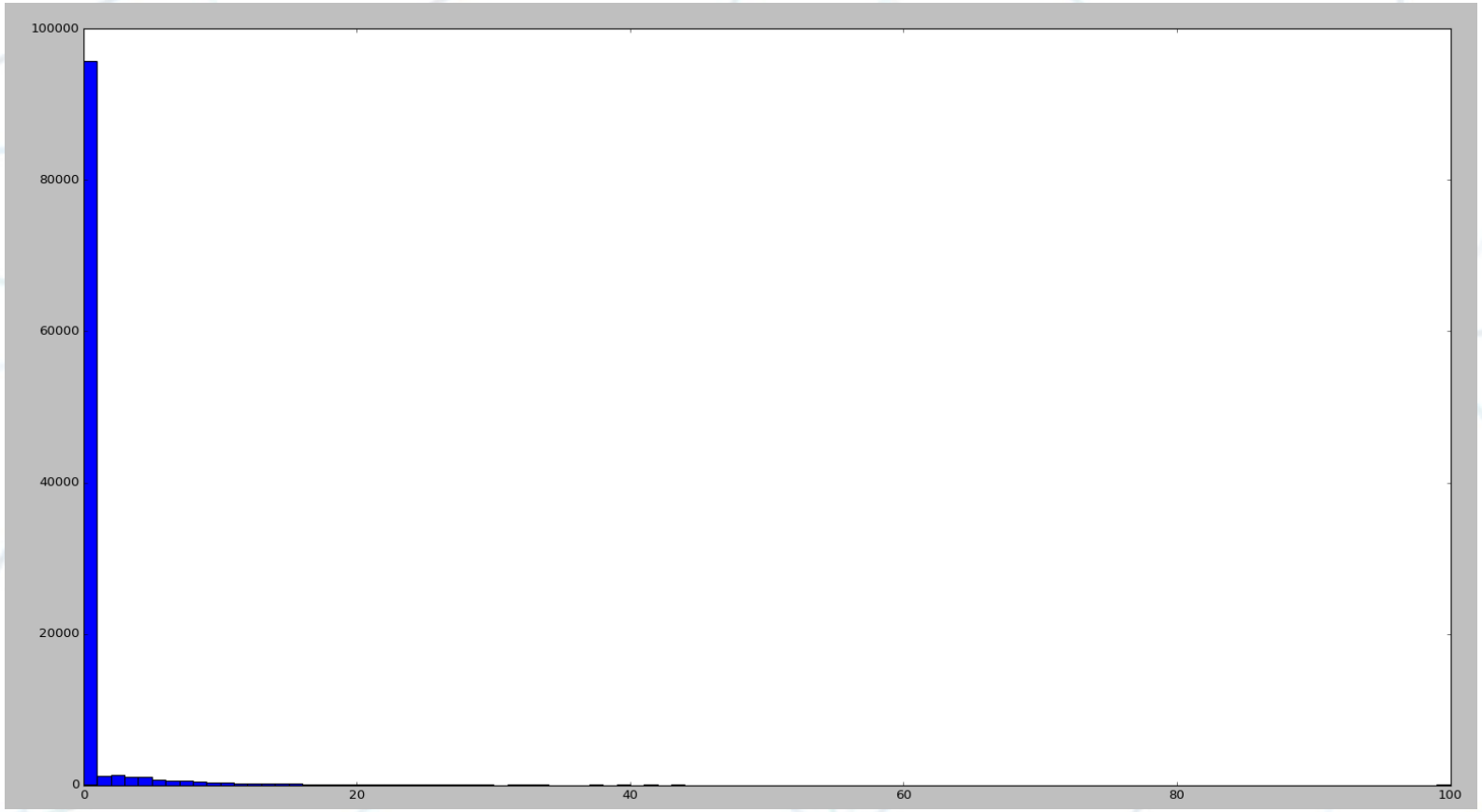
$$\mathrm{RMSE} = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}$$





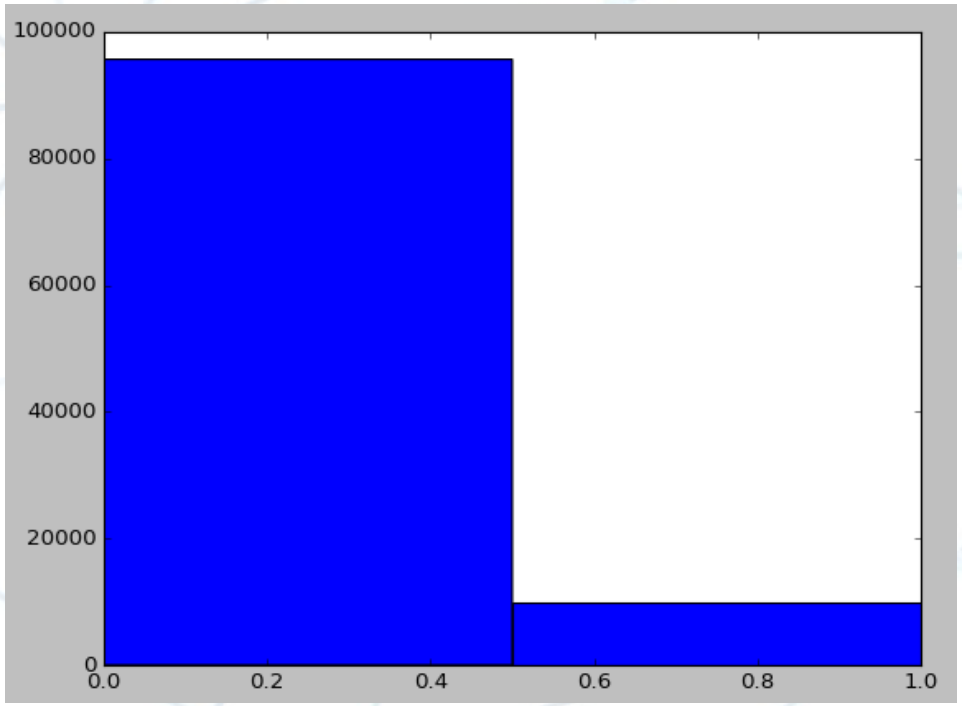
Think out of the box

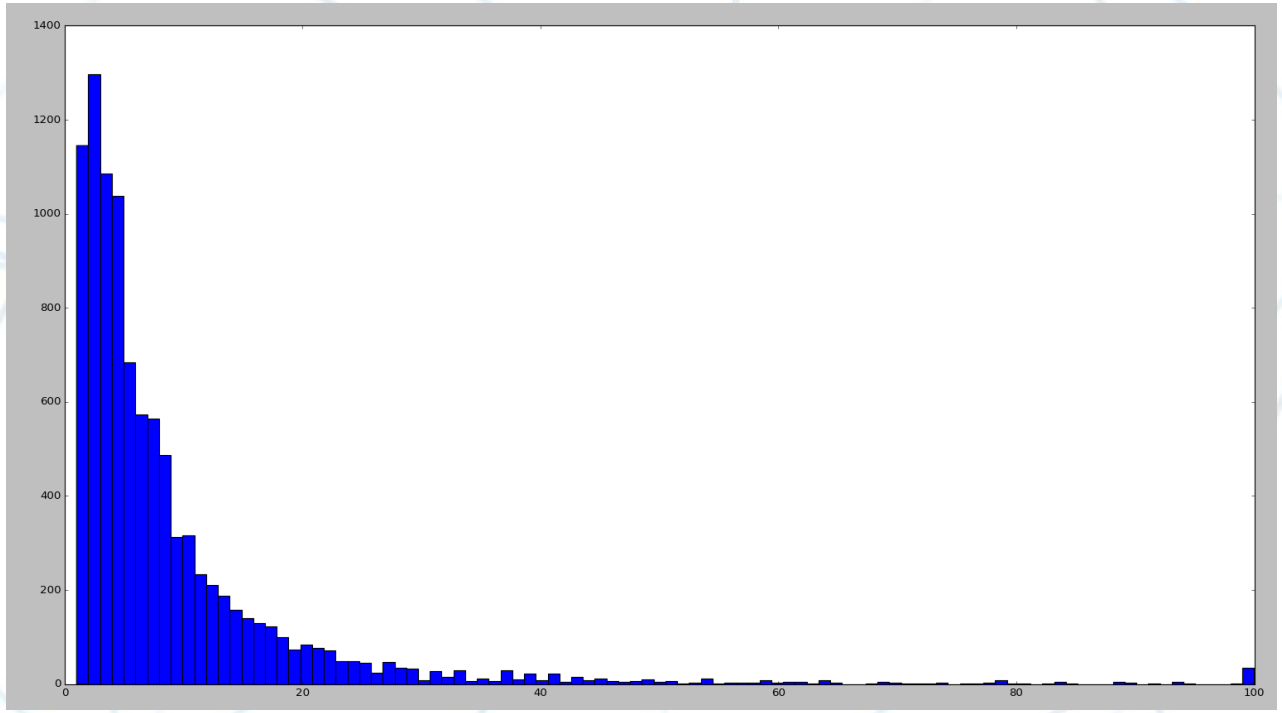
Loan default prediction



Think out of the box

Loan default prediction





Think out of the box

Allstate purchase prediction

Visit 1: A1, B2, C1

Visit 2: A2, B2, C1

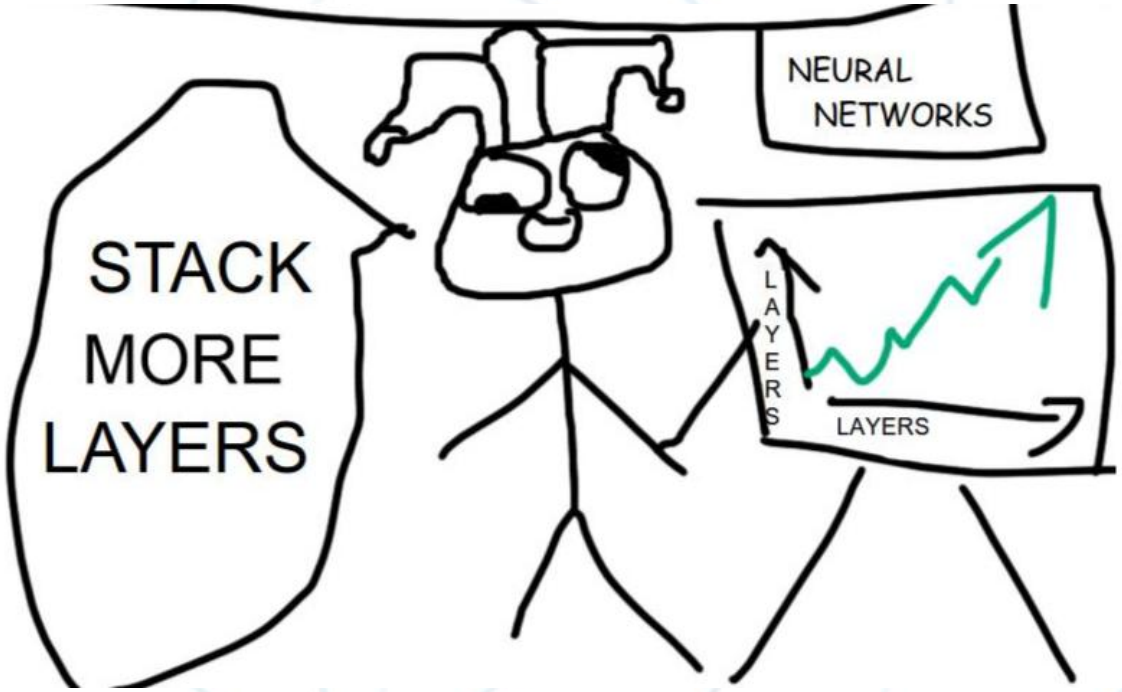
....

Visit 4: A2, B2, C1 (purchase)

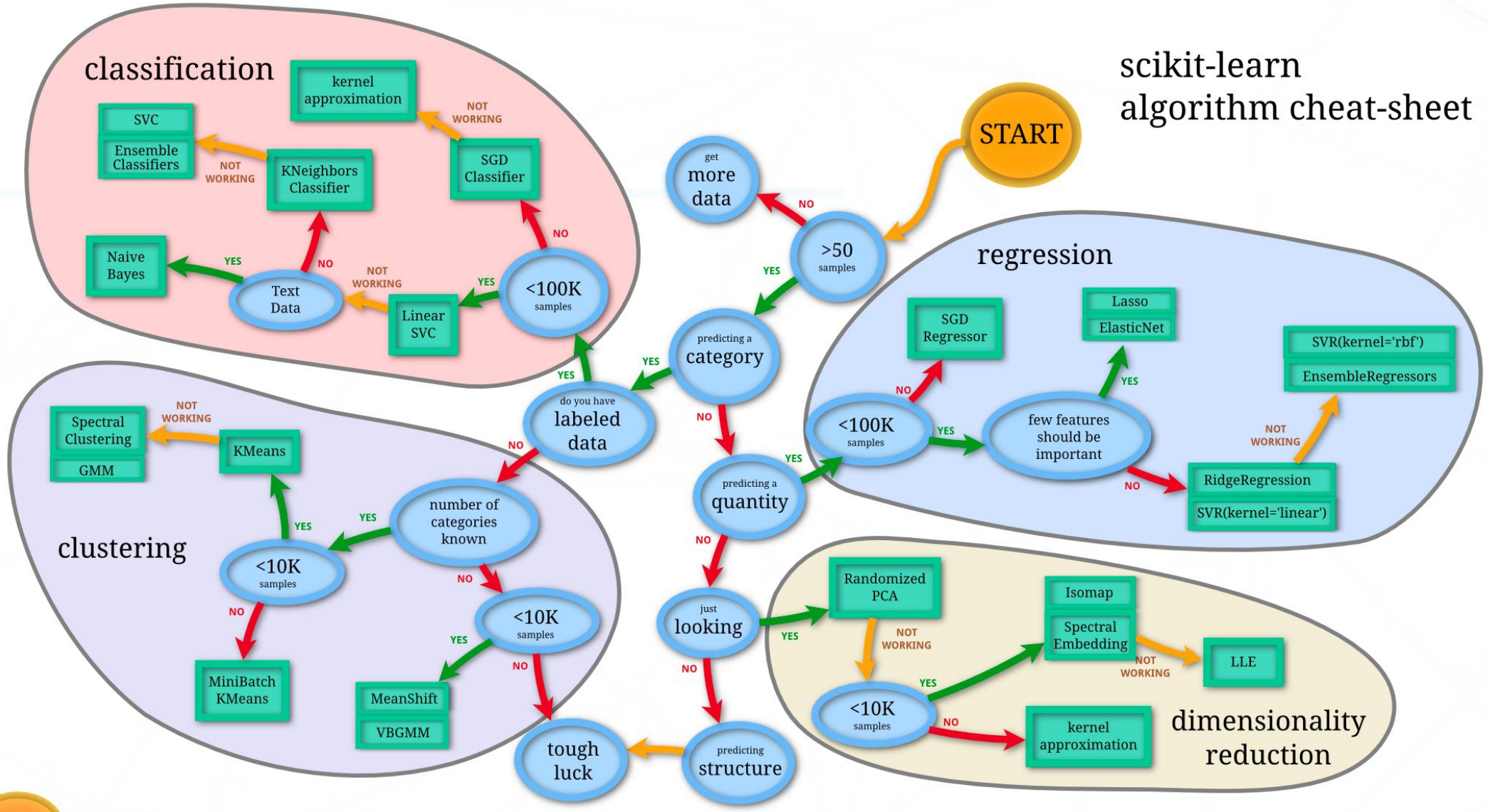
Which algorithm to use?

Deep learning!

Or else...



scikit-learn algorithm cheat-sheet



Back

Which algorithm to use?

Images, signals, text: deep learning

Otherwise:

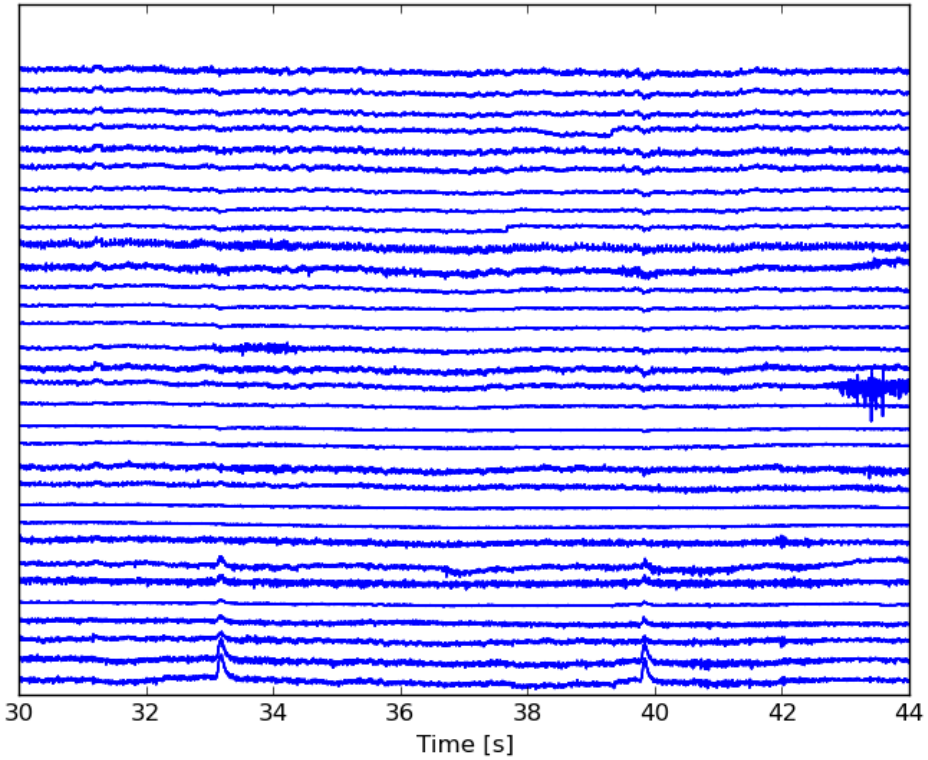
- linear/logistic regression
- tree-based methods (gradient boosting)
- (surprise surprise) deep learning
- and whatever else works

Start with the simplest things, then move to more complex algorithms.

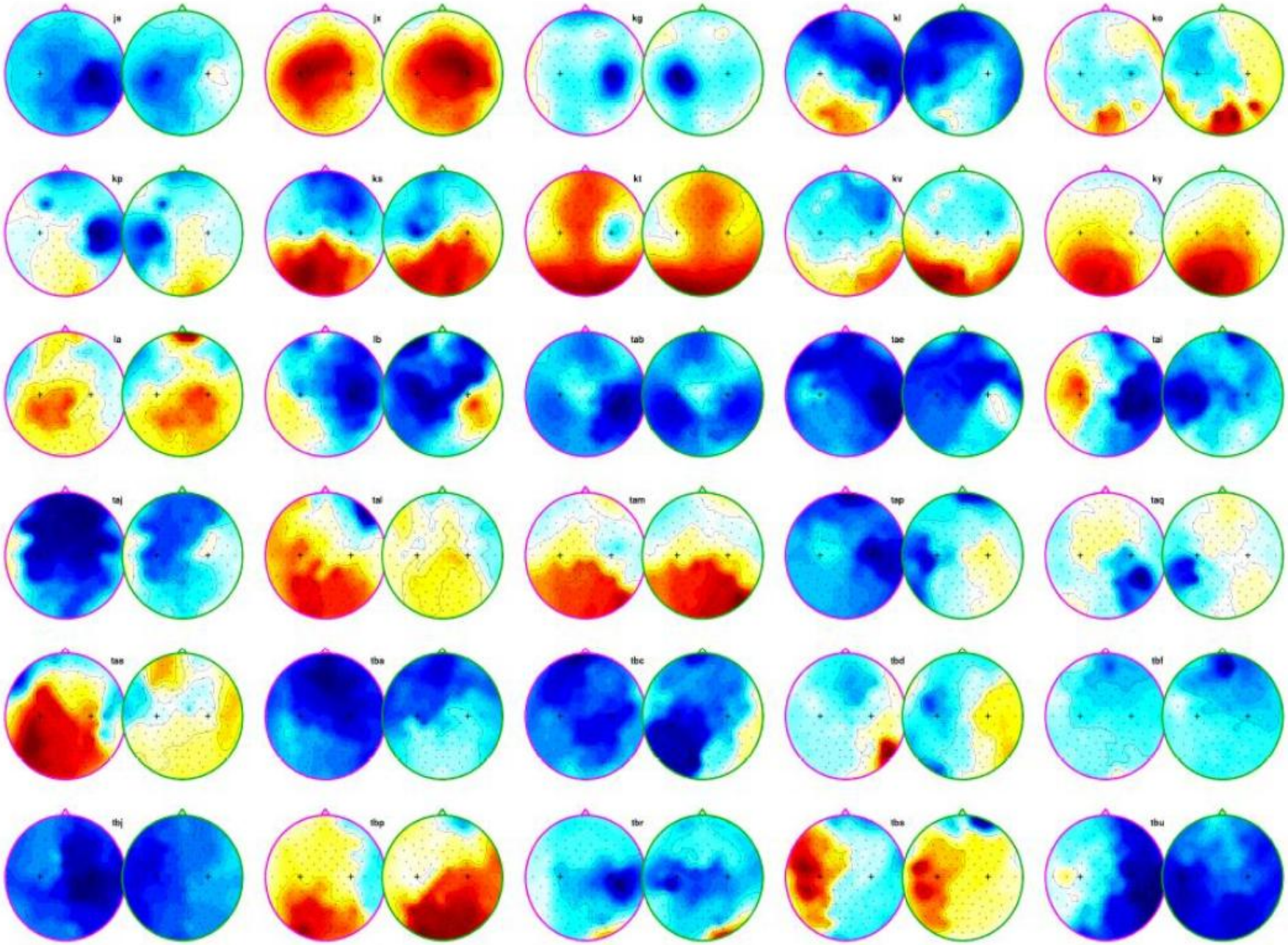
Data > algorithm

- Create new features
- Deep learning: data augmentation

EEG



EEG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tbj
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tbs
tbu

EEG

+ Clever features
+ Linear model (regularized)

#	△pub	Team Name ✱ in the money	Kernel	Team Members	Score
1	—	✱ the overfitting avengers			0.87224
2	—	✱ Devin			0.85669
3	—	✱ H2O.ai			0.81850
4	—	barrack_d(NER)			0.76921
5	—	Jose M.			0.74790

Ensembling

- Averaging
- Weighted averaging
- Stacking

Netflix prize

$1mln prize for improving recommendations by 10%

Solution: ensemble all the things!

- >500 models
- Unusable in production
- Ended up implementing a worse, but an elegant and practical solution

Seizure prediction

#	—	Team Name ✱ in the money	Kernel	Team Members	Score	Entries	Last
1	—	✱ Medrr			0.90316	264	3y
2	—	✱ cgp & Alexandre & blaine			0.86350	393	3y

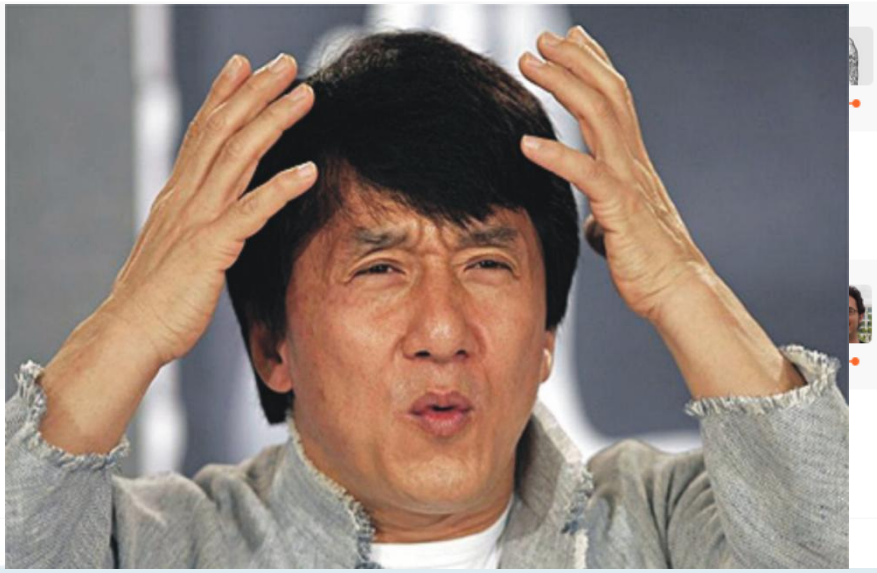
Your Best Entry ↑

Your submission scored 0.80582, which is not an improvement of your best score. Keep trying!

3	—	✱ Michael Hills			0.86248	427	3y
4	—	QMSDP			0.85951	501	3y
5	—	Carlos Fernandez			0.84225	299	3y

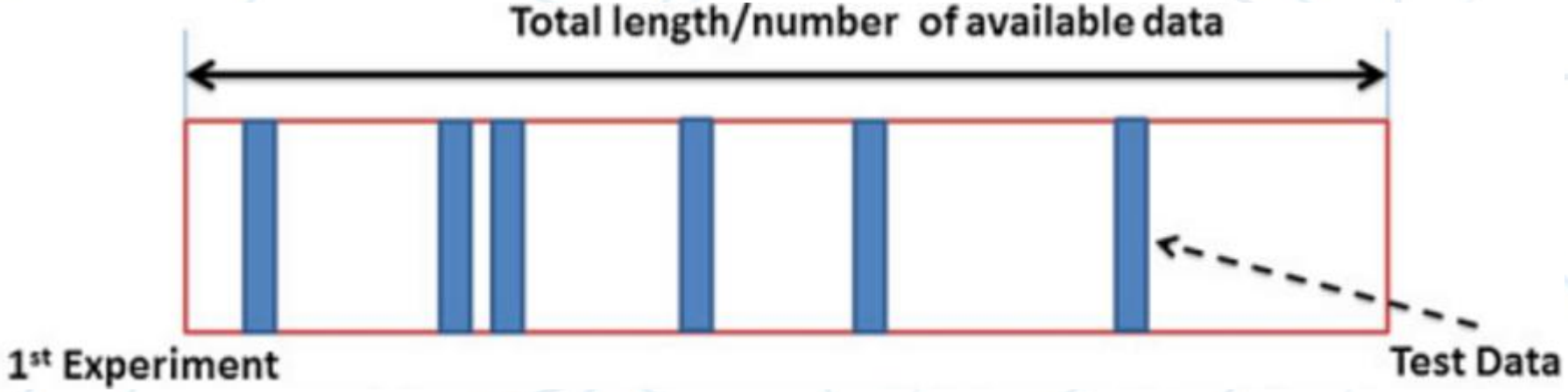
Seizure prediction

#	△pub	Team Name ✱ in the money	Kernel	Team Members	Score	Entries	Last
1	—	✱ Medrr			0.83993	264	3y
2	—	✱ QMSDP			0.81962	501	3y
3	—	✱ Birchwood			0.80079	160	3y
4	—	ESAI CEU-UCH			0.79347	182	3y
5	—	Michael Hills			0.79251	427	3y
26	—	cgp & Alexandre & blaine			0.75120	393	3y



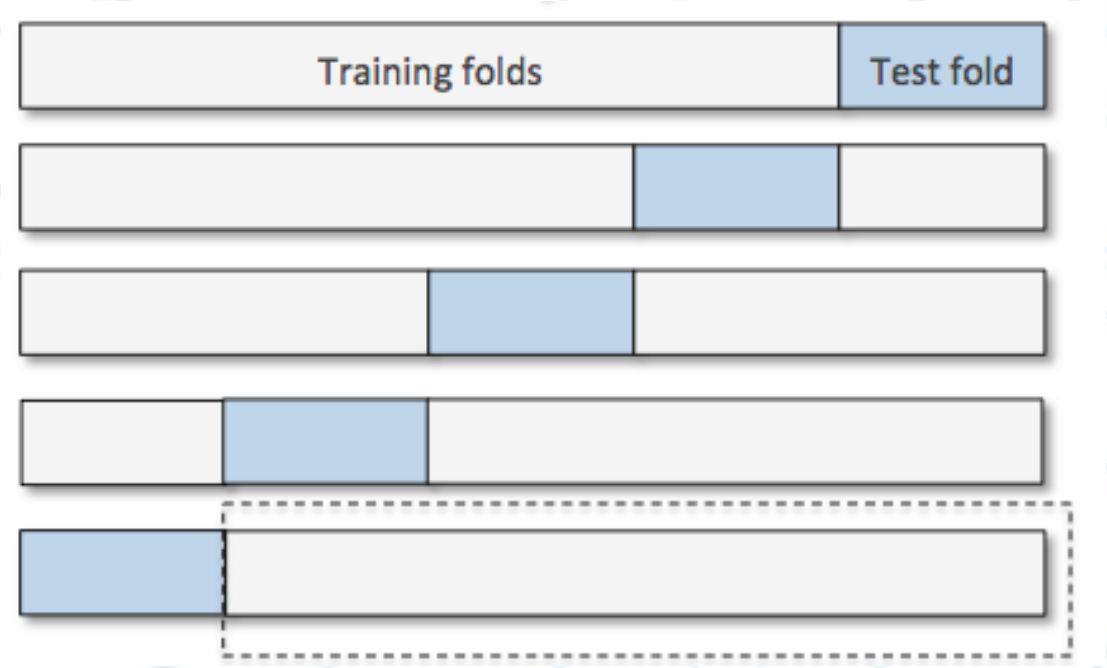
How do you know if it works?

Validate on a random sample of data

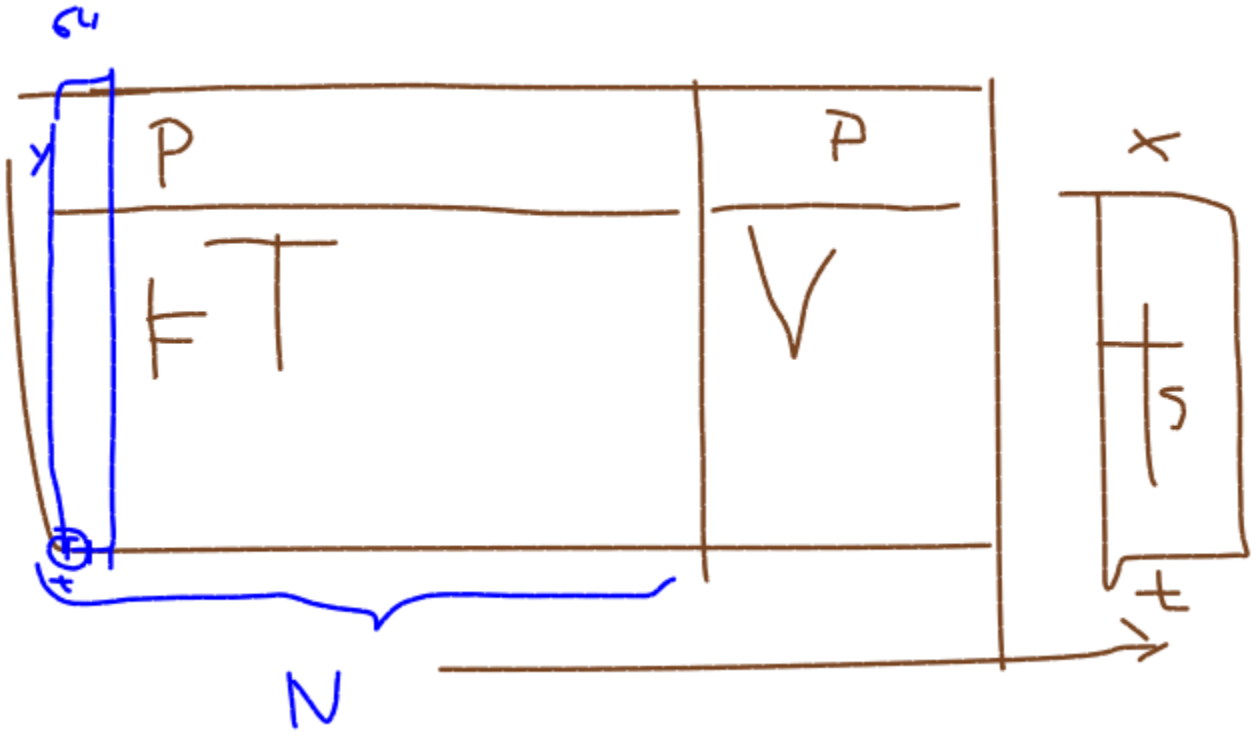


How do you know if it works?

Cross validation



Train/validation split in MEX



Final golden rules

Validate your model on a “real” scenario

this is the only valid approach of testing your model.

If it unexpectedly works REALLY great

then probably something is wrong.

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