2-INF-150: Strojové učenie / Machine Learning

Tue 11:30-13:00 C

Wed 13:10-14:40 C / H6

(tutorials approx. every two weeks instead of Wed lecture)

Tomáš Vinař, M-163 (lectures)

Marek Šuppa, M-25 (tutorials)

Vladimír Macko, M-25 (tutorials)

(office hours / consultations by e-mail appointment)

web: http://compbio.fmph.uniba.sk/vyuka/ml

(will switch to English in near future)

your responsibility to watch for announcements:

classroom.google.com code 0m43wz9

Recommended Literature

(pointers to selected chapters will appear on the course web site)

- **Goodfellow, Bengio, Courville: Deep Learning, MIT Press 2016** | www.deeplearningbook.org (full text available)
- Hastie, Tibshirani, Friedman: The Elements of Statistical Learning, 2nd ed. Springer 2009
  (I-INF-H-10)
- Bishop: Pattern Recognition and Machine Learning, Springer 2006
  (I-INF-B-38)

Other materials will appear in "handouts" section of the website
http://compbio.fmph.uniba.sk/vyuka/ml

Course Grades

30% - homework assignments (3x)
30% - project
40% - final exam (written + oral)

bonus points:

- Tutorials (5% per tutorial)
- In-class activity, lecture notes, ...

A: 90+, B: 80+, C: 70+, D: 60+, E: 50+, FX
You must pass the final exam with at least 50%

Project

1. Choose any machine learning application / Write up a short project proposal (deadline mid-semester)
2. You will receive feedback on your proposal
3. Implement several methods
4. Evaluate them on real data
5. Write up a report: 5-15 pages

Deadline: one week before the final exam

Good project must contain something interesting: more information will appear on the web site

Alternative: 10th place or better at a "serious" Kaggle competition (serious = there is money involved, no mention of Santa)

Academic Integrity

Copying from classmates, the internet, literature, ...

Grade of -100% (both parties)

Cheating on exams: **automatic Fx, no recourse**

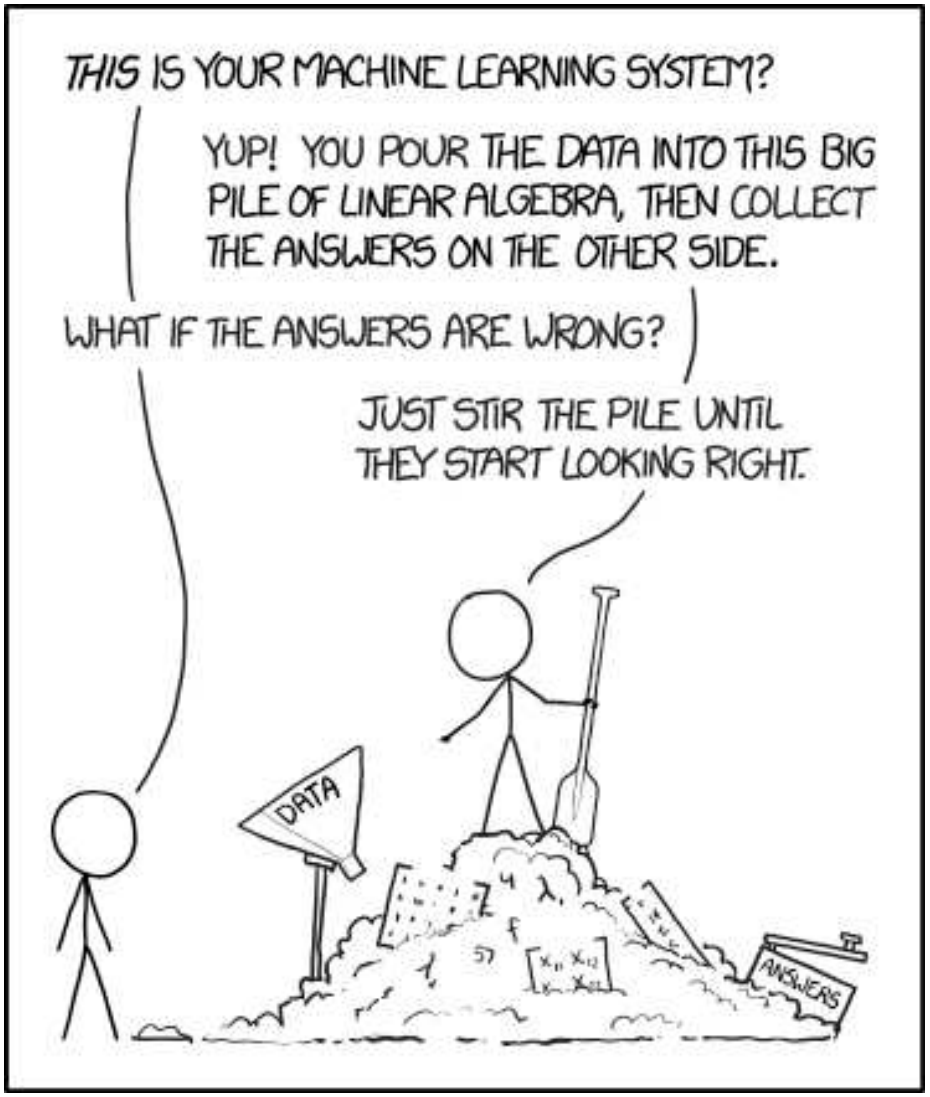
We support group discussions, however:

- Do not keep any notes
- Wait for several hours before writing up a solution
- Solutions handed in must be your own work

More detailed rules on the web site.

Machine Learning: Field of study that gives computers the ability to learn without being explicitly programmed.

Arthur Samuel, 1959


THIS IS YOUR MACHINE LEARNING SYSTEM?
YUP! YOU POUR THE DATA INTO THIS BIG PILE OF LINEAR ALGEBRA, THEN COLLECT THE ANSWERS ON THE OTHER SIDE.
WHAT IF THE ANSWERS ARE WRONG?
JUST STIR THE PILE UNTIL THEY START LOOKING RIGHT.
DATA
ANSWERS

xkcd.com

Preliminary Outline of the Course

- **Supervised learning:** linear regression, logistic regression, neural networks, SVM, decision trees
- **Unsupervised learning:** clustering, dimensionality reduction
- **Basics of machine learning theory:** bias-variance trade-off, regularization, PAC learning and VC dimension
- **Other topics:** on-line learning, bagging and boosting, reinforcement learning