

## 2-INF-150: Strojové učenie / Machine Learning

Uto 09:50-11:20 B

Str 14:50-16:20 B / H6

(cvičenia zhruba každé dva týždne)

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(konzultačné hodiny - dohodneme sa e-mailom)

**web:** <http://compbio.fmph.uniba.sk/vyuka/ml>

**oznamy, odovzdávanie úloh, Q&A:**

classroom.google.com kód zn5lgw7

## Odporúčaná literatúra

- **Goodfellow, Bengio, Courville: Deep Learning, MIT Press 2016** | [www.deeplearningbook.org](http://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)
- Ďalšie materiály budú zalinkované na stránke v sekcii “handouts”

## Hodnotenie

15% - domáce úlohy (3x)

5% za cvičenie - cvičenia

30% - projekt

40% - záverečná skúška (písomka)

A: 90+, B: 80+, C: 70+, D: 60+, E: 50+, FX

Záverečnú skúšku musíte napísať aspoň na 50%

## Projekt

1. Vyberte si aplikáciu strojového učenia
2. Spíšte krátky návrh projektu (18.11.)
3. Dostanete spätnú väzbu
4. Naimplementovať niekoľko metód / variantov
5. Vyhodnotiť na reálnych dátach
6. Spísať report – 5-15 strán

**Deadline:** 7.1.2025

**Dobry projekt by mal obsahovať niečo zaujímavé:** viac informácií na stránke

## Akademická integrita

Opisovanie od kolegov, z internetu, z literatúry, ...

**Známka** –100% (obaja)

Opisovanie na skúškach: **automatické Fx, žiadna možnosť opravy**

Diskutujte s kolegami, ale:

- Nepíšte si poznámky
- Počkajte zopár hodín pred tým, ako začnete písať riešenie
- Výsledné riešenie musí byť vašou vlastnou prácou

(ChatGPT si zaslúži vašu úctu, správajte sa k nemu ako ku kolegovi)



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

*Arthur Samuel, 1959*

*Two machine-learning procedures have been investigated in some detail using the game of checkers. Enough work has been done to verify the fact that a computer can be programmed so that it will learn to play a better game of checkers than can be played by the person who wrote the program. Furthermore, it can learn to do this in a remarkably short period of time (8 or 10 hours of machine-playing time) when given only the rules of the game, a sense of direction, and a redundant and incomplete list of parameters which are thought to have something to do with the game, but whose correct signs and relative weights are unknown and unspecified. The principles of machine learning verified by these experiments are, of course, applicable to many other situations.*

# nature

THE INTERNATIONAL WEEKLY JOURNAL OF SCIENCE

At last — a computer program that  
can beat a champion Go player **PAGE 484**

## ALL SYSTEMS GO

CONSERVATION

### SONGBIRDS À LA CARTE

*Illegal harvest of millions  
of Mediterranean birds*

PAGE 452

RESEARCH ETHICS

### SAFEGUARD TRANSPARENCY

*Don't let openness backfire  
on individuals*

PAGE 450

POPULAR SCIENCE

### WHEN GENES GOT 'SELFISH'

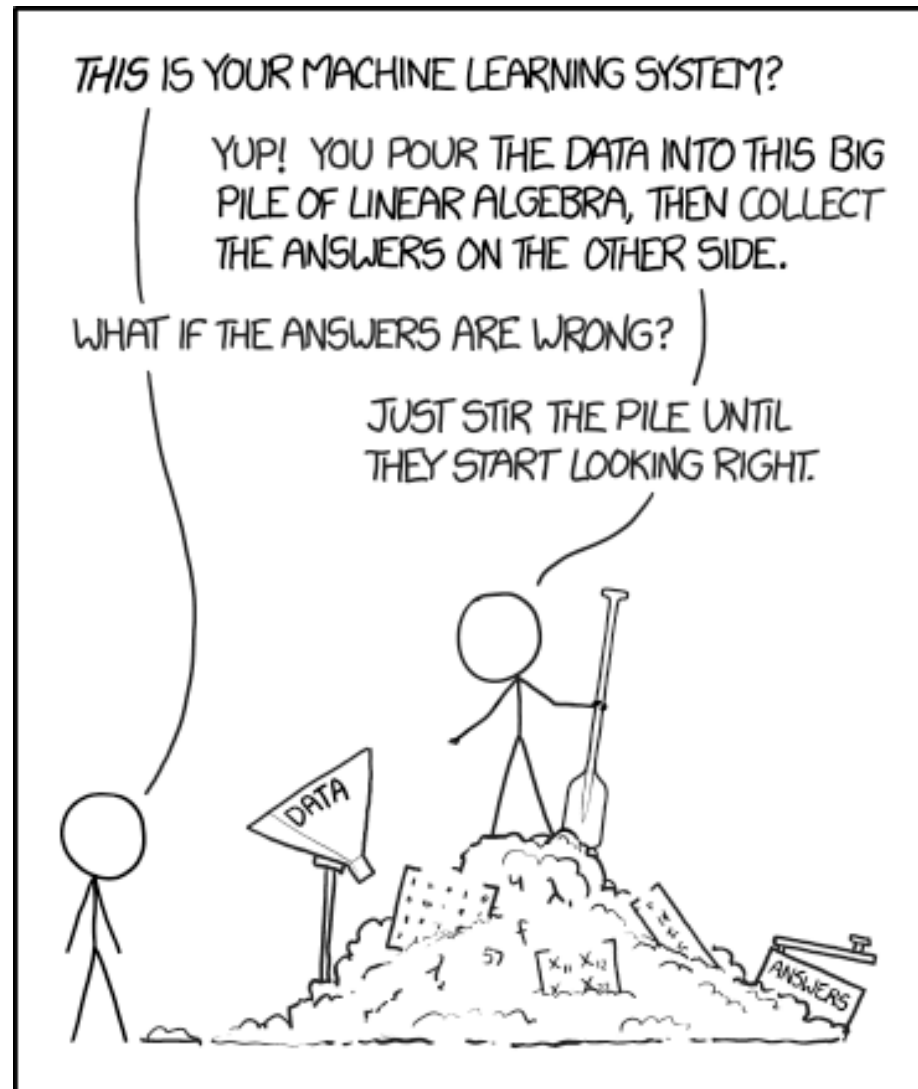
*Dawkins's calling  
card 40 years on*

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## 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