Machine Learning

- Exercise 1, 29.04.2015
- Introduction

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Roadmap

- Organisational matters
- Hints
- Motivation
- Exercise
Organisational matters
Organisational Matters

- First exercise (14:00 – 16:00) in **English**
- Second exercise (16:00 – 18:00) in **German**
Hints

Learning in general
Hints

- Background: Train the trainer

Source: National Training Laboratories, Bethel, Maine
Hints

Higher Elaboration = Higher Benefit = Less long time effort

Bloom’s taxonomy, which describes cognitive tasks in ascending orders of complexity, appears to be supported by neuroscience research. Recruiting volitional control, memory, and emotions through active learning techniques increases performance.

Neocortex volitional control
Hippocampus memory
Amygdala emotions

Brain image by Looie496 [Public domain], via Wikimedia Commons.

Source: http://gsi.berkeley.edu/gsi-guide-contents/learning-theory-research/neuroscience/
Motivation

• Learning in your brain

Motivation

Applications:

Opinion Mining: Max Zimmermann (PhD): Understanding and Monitoring Attitudes of Product Properties over Time

Source: http://dmir.inesc-id.pt/project/POPSTAR
Exercises

Exercise 1-1 Linear Algebra

Matrix multiplication

Source: http://de.wikipedia.org/wiki/Matrizenmultiplikation
Exercises

Exercise 1-1 **Linear Algebra**

- Matrix determinant

![Matrix determinant diagram](http://www.tf.uni-kiel.de/matwis/amat/def_en/kap_7/basics/b7_3_1.html)
Exercises

Exercise 1-2 Vector Calculus

Standard scalar product

Source: wikipedia.org
Exercises

- Exercise 1-3 **Perceptron**
- Heaviside function

Source: wikipedia.org
Exercises

Exercise 1-3 Perceptron

Activation function

Source: lecture
Thank you ...