**TA duties**

15 TAs in total.

TAs are divided into 5 pairs, each pair is responsible for giving feedback on some other week's exercises and organizing one exercise session each week.

4 TAs are responsible for the project: Caglar, Sophie, Sanna, Marko

4 Coordinating TAs: Hans, Fanni, Joel, Mohammad

All TAs participate in helping students on the weekly basis.

Each week 4 TAs are familiar with the exercises. They will have the main responsibility in arranging the exercise sessions of the week. The exercise session format: answers for the previous week, hints for the next week. The TAs have flexibility in deciding how to run this, but let’s discuss the plans together. It would be good to have the possibility to have a one-on-one with the TA, but let’s think carefully how to arrange this, so that this does not get out of hands.

Weekly meeting with the TAs.

Contract: 1 day per week for the duration of the course + some weeks before/after the course (10 weeks in total).

**Lecturers:**

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**Project TAs**

Caglar Hizli

Sophie Wharrie

Tin Lun (Sanna)

Marko Ikävalko

**Coordinating TAs**

Hans Moen

Fanni

Joel

Mohammad

**TAs for the weekly exercise sessions (5 sessions in total, 2 TAs present in each, let’s try to find two more TAs)**

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**Preliminary course outline:**

1. Introduction

-Course practicalities

-Overview of ML

-Data matrix

-Exploratory data analysis (Scatter plots, histograms)

-Basic features for text, images

-Convolution

2. Regression

-Linear regression

-Regularization

-Model selection (train-validate-test)

3. Classification

-Logistic regression

-Loss functions

-SVM

-kNN

4. Feature learning and visualization

-Problems with high-dimensional data (curse of dimensionality,...)

-PCA

-t-SNE

-Visualization of high-dimensional data

-Confusion matrix, AUC

5. Non-parametric methods

-Decision trees

-Pruning

-Random forests

-Boosting

6. Deep learning

-Intro to ANNs

-Backpropagation

-CNN, pooling

7. Clustering

-K-means,

-DBSCAN

-Application examples for both.

8. Probability theory

-Parametric probability density functions

-Maximum likelihood principle using the Gaussian

-Bayes estimation

-Bayes classifier (1D)

-Multivariate Gaussian (mean, covariance, correlation)\*

9. Reinforcement learning

-Basic concepts

-Multi-armed bandit

-Online advertising

10. Reinforcement learning

-MDP briefly

-AlphaGo (incl. advanced techniques: search, planning, value function approximation)