Introduction to Machine Learning

Image recognition in Python and Tensorflow

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Introduction

Esten H. Leonardsen
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Interests:
- Talking about esoteric theory
- Making deep learning tutorials

Martin Hovin
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Interests:
- Installing tensorflow
- Debugging Estens code

Introduction

Theory session:

- What is a statistical learning model?
- What is a loss function?
- How do we train a statistical learning model?
- How does a (deep) neural network work?
- What operations does a convolutional neural network use?
- What is transfer learning?
- What is overfitting?
- How do we combat it?

Practical session:

1. Set up a Python-environment containing Tensorflow
2. Use a pretrained convolutional neural network to predict
3. Fit a flower classifier using transfer learning
4. Improve the flower classifier

Summary

- What is a statistical learning model?
  A formula representing the relationship between inputs and outputs
- What is a loss function?
  A function quantifying how good a model is
- How do we train a statistical learning model?
  Gradual updates of parameters using gradient descent
- How does a (deep) neural network work?
  Sequentially applying (non-linear) artificial neurons to inputs
- What operations does a convolutional neural network use?
  Alternating convolutions and pooling
- What is transfer learning?
  Retraining an already trained model for a new problem
- What is overfitting?
  When a model learns patterns in the training data that does not hold generally
- How do we combat it?
  Rigorous testing, regularization and data augmentation