Case 2. Diabetic Retinopathy Analysis

Cognitive Systems for Health Technology Applications, Spring 2019

Type

Pair (2 persons) or individual work, 25-40 hours

Aim

The aim of this assignment is to learn to use convolutional neural networks to classify medical images.

Task

Your task is to use convolutional neural networks to create a classifier for diabetic retinopathy images.

Download and extract the dataset from: https://github.com/Nomikxyz/retinopathy-dataset.

You may study and reuse parts of the codes provided in: https://www.kaggle.com/c/diabetic-retinopathy-detection/kernels, but make your own experiments and write your own Notebook applying keras functionality. Remember to give credits to those authors from you have gained inspiration.

Return

Save your results to your GitHub folder and provide a link to your Notebook(s) in OMA.
Use OMA's hyperlink tool for providing the link.

Evaluation

The following categories are used for evaluation:

- Organisation
  - The code is sequential and the code cells (parts of scripts) are in right order
  - The document follows a clear structure
- Clarity
  - The document (and embedded code) is clear, polished, and easy to understand
  - The code follows good coding practices and contains sufficient comments
  - The document parts support the code
- Contents
  - The background and data preprocessing are well explained
  - The models are validated
  - The results are reasonable
  - The conclusions are clearly stated and in a line with the results

max. 20 points. Late submission reduces the maximum achievable points.

Materials

- Loading from external datasets
- Imageio usage examples
- Introduction to convnets
- Using convnets with small datasets
- Guide to sequential model
- Convolutional layers
- https://www.kaggle.com/c/diabetic-retinopathy-detection/kernels