**Feature Extraction Approach for the Computational Diabetic Retinopathy Detection in Retinal Images**

Steps to be followed

## Software Requirements

• Matlab

## Hardware Requirements

• Modern CPU

## Data Resource

•Further information: <https://www.kaggle.com/c/diabetic-retinopathy-detection>

## Data Format and Structure

• 88702 JPEG Images

• Feature Extraction on CPU

⁃ Folder with Subfolders

⁃ Each Folder represents a particular Stage of DR (e.g. ../RetinalImages/0/ ../RetinalImages/1/ ../RetinalImages/2/ ../RetinalImages/3/ ../RetinalImages/4/)

⁃ Retinal Grey Scale Images (Suggested: Green Component) are within the corresponding Folder

## SVM Approach / Feature Extraction

• Matlab / CPU

⁃ Primary used for comfortable Visualization of Results and Establishment of Image Processing Pipeline

⁃ Open File ../CPU/featureExtraction.m in Matlab

⁃ Execute

function [ MAT, rowValue ] = featureExtraction(imagePath, class, destinationPath, plot)

⁃ Corresponding Explanation of Variables is stated within the m-File

## SVM Approach / Classification:

• Resulting Feature Matrix is saved in following Form

Image,Class,Bloodvessels,Haemorrhages,Exudates,Contrast,

/home/kapsecker/imagesGrey/2/30\_right.jpeg,2,0.000616252,0,0,0.255243,

/home/kapsecker/imagesGrey/2/40\_left.jpeg,2,4.10808e-05,0,0,0.273186,

/home/kapsecker/imagesGrey/2/51\_left.jpeg,2,4.98195e-06,0,0,0.116361,

/home/kapsecker/imagesGrey/2/54\_left.jpeg,2,0.00131854,0,0,0.175058,

/home/kapsecker/imagesGrey/2/78\_left.jpeg,2,0.000438692,0,0,0.114433,

/home/kapsecker/imagesGrey/2/78\_right.jpeg,2,0.000346607,0,0,0.109931,

/home/kapsecker/imagesGrey/2/79\_left.jpeg,2,4.25127e-06,0,0,0.191255,

/home/kapsecker/imagesGrey/2/79\_right.jpeg,2,8.10398e-06,0,0,0.270105,

/home/kapsecker/imagesGrey/2/82\_left.jpeg,2,0.00180359,0,0,0.650781,

/home/kapsecker/imagesGrey/2/129\_left.jpeg,2,8.80809e-05,0,0,0.135238,

/home/kapsecker/imagesGrey/2/129\_right.jpeg,2,0.000138166,0,0,0.148248,

…

## Results:

• Feature Matrices, obtained from Feature Extraction Process, are saved in ../Features/

Remark, that they are distinguished by Diabetic Retinopathy Classes