Notes 10-03

# B-spline

Raquel and Funmilayo

* Gradient descent and **adaptive gradient descent** are tried
* The weight penalty (for the bending energy term) didn’t change much, therefore they decided to not include a penalty
* 16 is the optimal spacing (is performing well overall)
* Localized mutual information was used

# Affine

Lotte uploaded the parameters on GitHub and wrote a piece about it in the report

## Report

🡪 look at the introduction and methods as a whole

Explain common information in the affine part and later specify what is different / special about the B-spline

# Fusion of the labels

Method gives probabilities to the pixels. Less inputs means a less accurate fused mask. We also have to set a threshold in this methods.

First optimize the number of masks that will be merged and later optimize the threshold for this function

# Measure similarity between two images

Christos looked into different methods

Qualitatitve similarity: however that is not able to include details into the comparison

Sewar (library): we will try 3 different similarity metrics and see what comes out

* Mean squared error
* Root mean squared error: might be more accurate.

# Next steps

Leave one out cross validation 🡪 write code

* Affine transformation
* Select most similar images
  + Normalized MI
* B-spline transformation
* Image fusion (threshold)
* Dice score

Number of images we want to fuse: [4, 6, 8 ,10, 12]

# Machine learning part

Noortje ran the segmentation code, tried to fill in all #TODO for the GAN however that doesn’t work yet.

Proposed to create a Categorical GAN, as we can insert our labels (ground truth) and get an image based on that.

Optimalization of a GAN is hard as it is already optimizing itself. It is highly dependent on the initialization, so we have to run this multiple times

Questions to Cian:

* How to make sure the GAN doesn’t take too long?
* Ask about #TODO in GAN if we didn’t make it work

# Tasks

## Report

🡪 look at the introduction and methods as a whole

Explain common information in the affine part and later specify what is different / special about the B-spline

Lotte: look at report

## Registration

Leave one out cross validation 🡪 write code

* Affine transformation
* *Select most similar images* 
  + *Normalized MI*
* B-spline transformation
* Image fusion (threshold)
* Dice score

Number of images we want to fuse: [4, 6, 8 ,10, 12]

Create this code for Monday, on Monday we will try to generate some results

Funmilayo: leave one out cross validation

Raquel: similarity metric

Together make sure there is one code that includes everything

## Machine learning

Look at the GAN, think about a project approach

Christos, Milan & Noortje

We will meet at 11:30

We have at 13:30 meeting with Cian