# Notes 04-04-2023

## Machine learning

Funmilayo: write discussion about the data augmentation.

VAE: way lower loss obtained by changing the learning rate optimizer. Also, mse was used in the end.

U-net was overfitting on the baseline and the final model. Therefore, we added dropout layers. With this, the loss function improved, however it is still overfitting a bit.

Raquel also looked into transfer learning, there was not enough time for anymore.

Dice score, 2D. Apply the 3D dice score calculation, the same one as we used for the registration.

Lotte 🡪 upload the code for the 3D dice score

## Registration

Is now running.

## Result presentation in report

VAE optimalization not in introduction. Do put a table with final loss values in the report 🡪 put generated image.

U-net optimalization, do put a table with final loss values in the report. 🡪 write about the changed to the u-net we did compared to the original u-net.

## Study design

Well done!

# Next steps (16:00 on Wednesday)

* Lotte: get results of new data registration
* Raquel: get results of new data ML
* Christos: Method: add scheme of the U-net
* Christos: Method: dropout layer added in U-net
* Noortje: Method: VAE, explain which optimalization steps were done
* Noortje: Method: VAE, replace the piece of text in the beginning of the VAE
* Raquel: Method: ML, add evaluation is dice
* Raquel: Method: ML, train-validation split
* Milan: Method: make sure all parts are written in the same style
* Raquel: Results: add results of ML
  + Segmentation + image of generated image
  + Loss curve train and validation
  + Baseline: add loss curves and dice on validation
* Funmilayo: Someone: read registration discussion
* Funmilayo discussion: write discussion about the data augmentation
* Milan: Discussion: someone write about improvements of U-net (prevent overfitting), explain why it is overfitting with the low diverse synthetic data (much of the same data, so the model only learns that)
* Everybody: add what you have done
* Raquel + Lotte: Results: add test results
* Add section about the performance on test images
* Lotte: start the abstract

Christos: write part about U-net. Raquel will add the code on Github with dropout layer. Do review of report on parts about U-net and VAE.

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| Friday | Milan: Results resolution + l1  Funmilayo: Results data augmentation >14:00  Noortje: look how to save images generated |
| Saturday | Noortje: run 3x  Noortje: segmentation of VAE-images with basic U-net |
| Sunday | Raquel: run u-net (5x) |
| Monday  9:00 | **Extra images provided**  Lotte: registration method extra images  Milan: U-net method extra images |
| Tuesday  **8:30 meeting** | Result analysis  Finalize report  Funmilayo: Introduction add ML part  Lotte: discussion registration  Milan: SPADE  Raquel: look at study design table + data augmentation in report  Christos: look at report, U-net part + organization of result presentation (present in table and optimizers) |
| Wednesday  13:00 | **Hand in results**  Everybody: add what you have done in the project |
| Thursday  23:59 🡪 17:00 | **Hand in report**  **9:00 meeting** |