

Image Analysis Project 8QA01

Part 5 – Assignment

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Project goals

- Should skin cancer apps use image processing?
- You will use a public skin lesion dataset to:
 - Measure features from an image (video 2)
 - Classify an image as suspicious or not (video 3)
 - Evaluate your results (video 4)



Design-Based Learning at TU/e

In DBLs, the goal is to connect theory, modeling and experiments

- What features do we want to measure and why? (Theory)
- How to measure, and how to train a classifier? (Model)
- How good is our model? (Experiment)

Project assessment

You should focus on

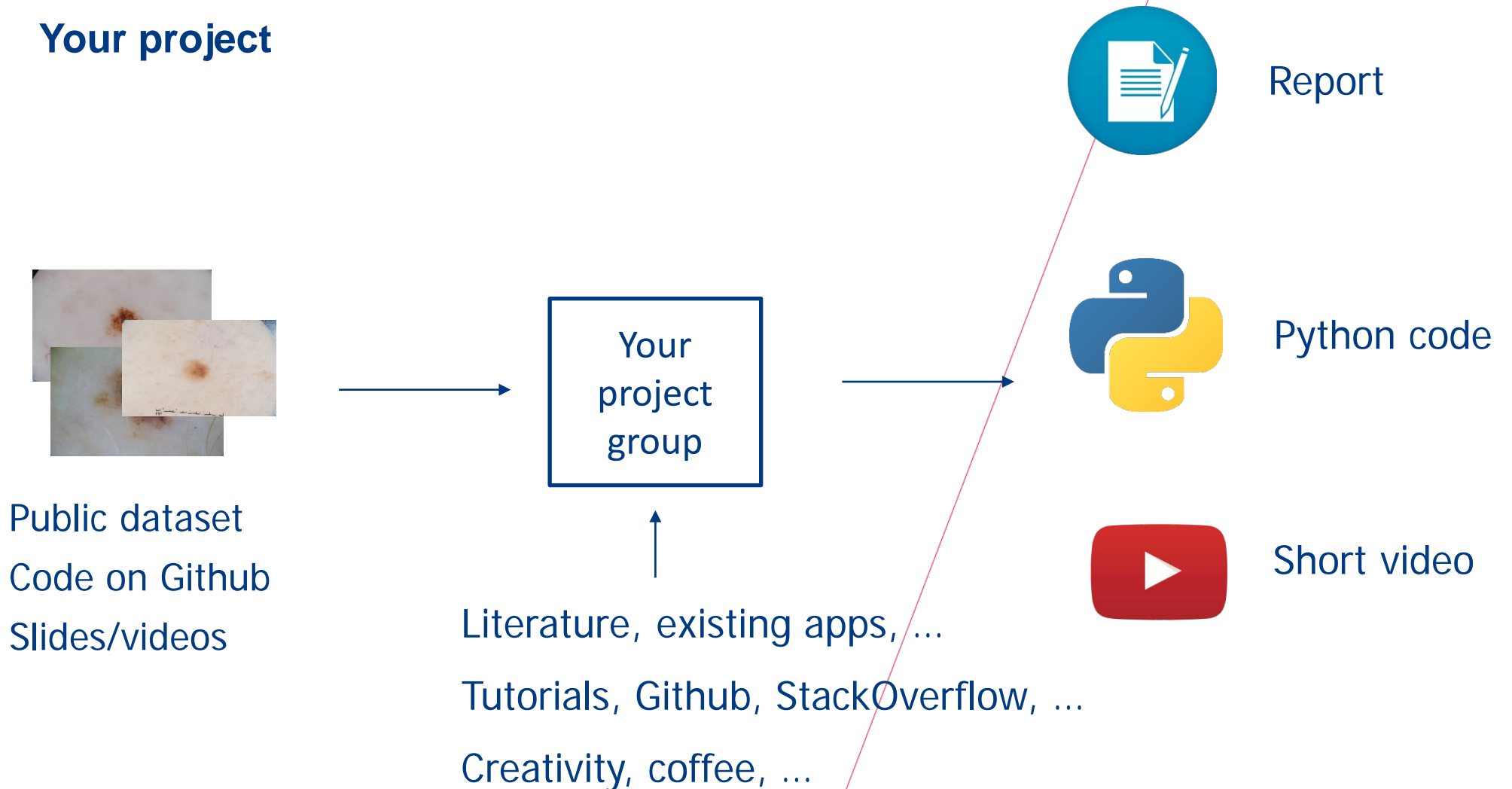
- The quality and creativity of your choices (report & code)
 - Is there a good motivation?
 - Is the implementation reasonable?
 - More than the “default” solutions already given to you
- Explaining your solution (report & presentation)

Project assessment

You probably should NOT

- Implement as many things as possible, without understanding them
- Only focus on maximizing the classification performance
- Think there is just one “correct” solution

Your project



Week 1 - Data

- Data from ISIC 2017 Challenge
 - Image
 - Mask
 - Information (image ID, age, sex)
 - You will get the labels (melanoma, keratosis, or health) in week 3/4



Weeks 1-3 – Data exploration & literature study

- For our dataset, what do we want to measure?
- How could we measure these things automatically?
- When you have an idea of the features, measure them by hand
- This will allow you to proceed with the classifier & experiment, even if your feature code is not finished yet

Weeks 1-3 – Literature study & further planning

- What do you want to test about your method?
- You could already create the (pseudo)code for an experiment, even if you do not have your final features or classifier yet.

Week 4 – Intermediate assignment

- 1-2 pages description of
 - Features you want to measure & steps needed (pseudocode)
 - Plan for 1 experiment (pseudocode)
 - You are allowed to change these for the final assignment
- Excel sheet with 2-3 features you want to measure, but measured by hand
- In a few days, you will get feedback and also the labels for your images

Week 4 - 7 – Implementation, experiments, reporting

- Use feedback to finalize choice of features & experiment
- Finish code, run experiments
- Prepare report, code, presentation

Week 7 – Deadline final assignment

- Report (see Github for details)
- Python code
- Youtube video
 - “Presentation” of maximum 3 minutes
 - For an audience of your choice

Tips from project groups of previous years

- “Don’t spend too long on literature in the beginning”
- “Make a plan, especially for time away from campus”
- **“Start coding early”**
- “Don’t be afraid to try things out”
- “You can do it even if nobody has programmed before!”

Project repository

<https://github.com/tueimage/8qa01>

README.md

Course Project: Image Analysis for cancer risk assessment (8QA01)

Getting started

In this project you will work with Python. This means you will need an to install software to run and edit Python code. We have a tutorial which guides you through this here: <https://github.com/tueimage/essential-skills/blob/master/python-essentials.md>

For this course you can use Jupyter Notebook which is covered in the tutorial, but other software (if you use it in other subjects) is also possible.

Structure

The overall project steps can be found in the notebook (project_walkthrough.ipynb), which already contains a general script to go through all the images, measure simple features, and create a plot of the measurements. You can use this