Data Science Survival Skills

Homework 3

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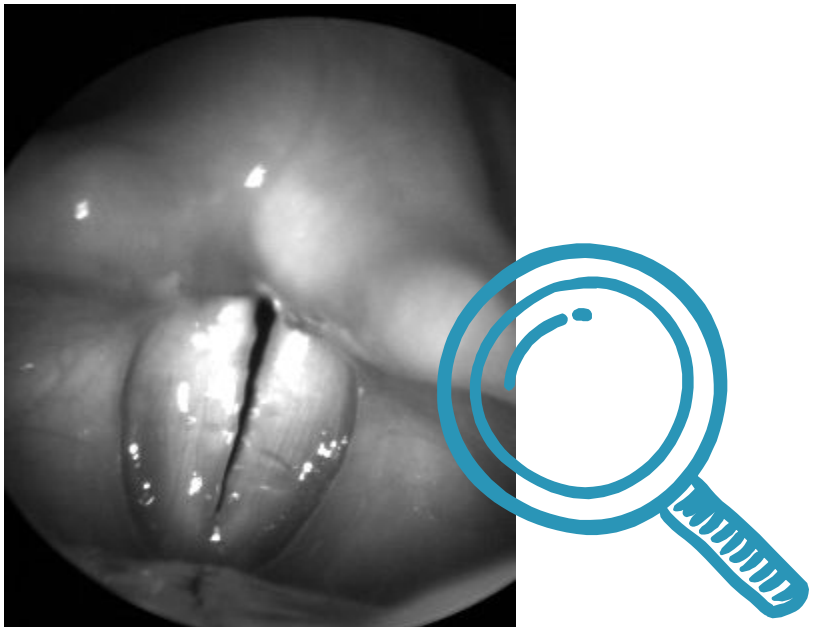
In this week's lecture, we covered some kinds of data files and talked about datasets. You will have to work now with a mini version of the Benchmark for Automatic Glottis Segmentation (BAGLS) dataset. After that, the task is to convert an image from RGB to grayscale.



Homework 3: Tasks 1/4

We provide you a folder with a **MiniBAGLS** dataset (some images and their segmentation masks) in StudOn:

- Load four arbitrary images and their corresponding segmentation masks and metadata.

  ➜ **Slide: Screenshot of the code snippet**

Homework 3: Tasks 2/4

- Plot the images with the segmentation masks overlaid in a picture. To show **all** four resulting figures, please use the **subplots**() method from matplotlib.pyplot. Each subplot should have the “Subject disorder status” as the title (contained in the .meta file).

  ➜ **Slide: Screenshot of the plotted images**

Homework 3: Tasks 3/4

- Load the “leaves.jpg” that we have provided for you as RGB image. Implement the following three variations to convert an image from RGB to Grayscale. Again, use the **subplots()** function to show all three variants side by side.

  - Lightness Method

    $$grayscale = \frac{min(R, G, B) + max(R, G, B)}{2}$$

  - Average Method

    $$grayscale = \frac{R + G + B}{3}$$

  - Luminosity Method

    $$grayscale = 0.2989 * R + 0.5870 * G + 0.1140 * B$$

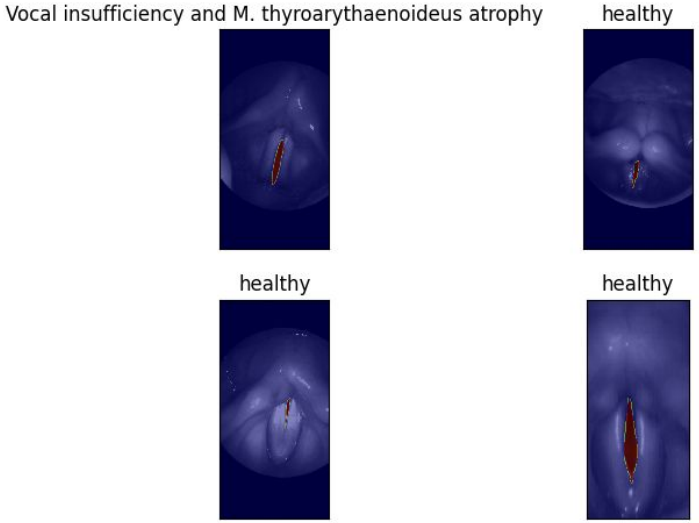
➜ **Slide: Screenshot of the plotted images**

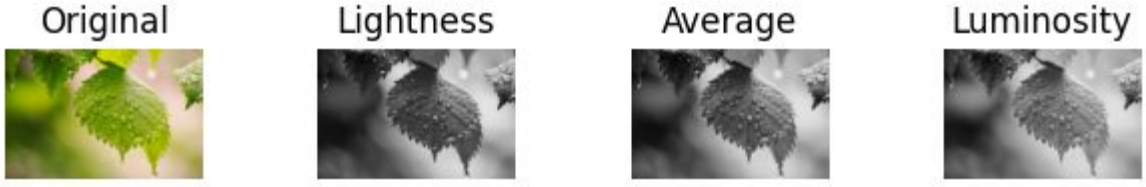
Homework 3: Tasks 4/4

- Answer the following question: which method for RGB to grayscale conversion is the preferred one? State in 1-2 sentences why you think this.

➜ **Slide:** **Your answer**

Homework 3: Example





Homework: Requirements

You must complete **all** homework assignments (**unless otherwise specified**) following these guidelines:

- **One** slide/page.
- **PDF** file format only.
- It has to contain your **name, student** (**matriculation**) **number** and **IdM** in the down-left corner.
- Font: **Arial,** Font-size: **> 10 Pt.**
- Answer **all** the questions and solve all the tasks requested.
- Be careful with **plagiarism**. Repeated solutions will not be accepted!