LUT
Lappeenranta
University of Technology

LUT Computer Vision and Pattern Recognition
BM40A0801 Machine Vision and Digital Image Analysis
Spring Term 2022

Xin Liu xin.liu@lut.fi

Daniel Batrakhanov Daniel.Batrakhanov@lut.fi

Practical assignment

1. Image classification

You task is to solve the following classification problem.
The dataset contains 31 classes of plankton images captured using CytoSense during 2020 and annotated by biologists from the Finnish Environment Institute (SYKE) in February 2021.

You will be given a dataset. The dataset is divided into training and test subsets. Your goal is to achieve good accuracy on the test subset using the training subset for the creation/training of your model. According to the submitted results, the group with the best one will be awarded a bonus.

When the task is solved, you need to upload a report explaining your approach, results, and responsibilities of each team member. First, choose a group. Second, prepare a solution for the task. Finally, upload one solution per group. Your solution should contain:

- *Your code*
- *Readme file (how to execute your code)*
- *Other files necessary to run your solution (trained CNN model weights, etc)*

The dataset: MVDIA_CS_2021

2. Documentation

Write a report about your project in English. The documentation should include a cover page where you give the course number and name, project title, date, and the names and student numbers of the 2 team, and responsibilities of each team member. The LATEX template for the LUT MSc. thesis is the correct starting point

Describe the methods used in such detail that a reader would be able to implement similar functions for the same purpose just based on your documentation and the cited references. Presenting an algorithm and explaining it in words can be used to describe the principles of methods. Justify your choices, that is, present grounds for selecting the methods for your solution.

At the end of your documentation, you should list all the references used. Note that you are allowed to use any references/information you wish. It is enough if one student from a group will upload the report.

Your report should contain the following parts:

i. **Cover page**
   Including: course number and name, project title, date, and the names and student numbers of the team, and responsibilities of each team member.
ii. **Introduction**
   Introduce the topic, define a task, specify work division between project members.
iii. **Literature review**
   Present relevant methods and approaches from scientific publications.
iv. **Method description**
   Describe the method which you have chosen for solving the task and explain why you have chosen this particular method.
v. **Experiments & Results**
   Present the details of your experiments and their results.
vi. **Discussion**

vii. **References**

3. Deadline and submission

The deadline of submitting the results of your work is given in the course web pages in Moodle.

The results of the work containing the pdf document (the report) and all relevant codes must be packed into a single file using tar and gzip. The file name of the package must be STNUM.zip where STNUM is the student number of one of the students in the group. When STNUM.tar.gz is extracted, it should create a single directory STNUM. This directory should contain a file README.txt shortly describing how to execute your code, as well as your report. In the package DO NOT INCLUDE any images that can be downloaded from Moodle. I.e., the package contains only the report (in pdf format) and the codes.

If there are any problems with this assignment, please contact Daniel Batrakhanov (Daniel.Batrakhanov@lut.fi) before making your own interpretations.

Please pay attention to the deadlines.