Content-Based Image Retrieval Application

Report Name	Project Outline
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Project Description

The aim of this project is to create an interactive user interface content-based image retrieval application which searches for image files of the user and categorises them. The application will group the images by categories, for example vehicles, animals and people.

Nowadays it is normal for individuals to have thousands of images stored on their devices, since most of the images contain arbitrary filename, it is time consuming for users to search for a specific image. Using this application, the user should be able to narrow down their field of search area and find the image quicker.

When the user selects a category to search in then the UI should show thumbnails of all the images that belongs in that category. When you click on that thumbnail, the application should be able to open the full image or take the user to the path of the file. To accomplish this project, the use of deep learning is required, for the application to learn which image belongs in which category. The software engineering methodology that would be used to during this project is agile methodology. This will make it easier to adopt to any changes. To test the application agile testing will be used, this will help to find errors quite early on in the project.

Proposed Tasks

The following tasks will be performed in this project:

- **User Interface –** An user interface needs to be designed and create so that the user can interact with the application.
- **Training –** The deep learning needs to be trained to a high level accuracy with data in order for the search application to be effective.
- **Testing –** The application needs to be tested to fix any errors. Unit testing will be the first stage of testing before integration testing and system testing. Then the usability of the application will be tested to get the user-end perspective.
- **Library and Language** – research and decide which deep learning libraries and programming language I will be using in this project. The popular library choice is either tensorflow [1] or pytorch [2]. Both of these libraries support most of the popular languages (python, Java, C++). Each libraries and languages have their pros and cons.
- **Meeting and Blog** – During this project I will be having a weekly discord meeting with my supervisor to keep him up to date with my progress. I will also be writing a blog on wordpress [3] which keeps track of what I am doing every week.

- **Set up a repository** – Github [4] will be used as a version control for my work. This will be a place where my supervisor can see my progress and provide any help if needed.

- **Select a methodology** – I need to choose the most suitable methodology for this project to help me manage building the application.

Project Deliverables

The following items will be delivered:

- **Final Report –** By the end of the project there should be a document which has an in-depth information of how the project works and what tools were used to accomplish this project.

- **A GUI Application –** This is the application the use will use to search for images by categories.

- **Final Demonstration –** This is a day at the end of the project where I demonstrate what have I achieved and show how well the application works.

- **Mid-Project Demonstration –** This will take place in March. During this meeting I will demonstrate what I have achieved so far and what I have yet to achieve.

- **UI Design -** Submit an UI design to my supervisor so he can see how the application will look once its finished. Also, will be able suggest any improvements.

- **Ethics Form –** This form will needs to be submitted to evaluate if this project is ethically sound and what ethical issues this project can cause.

Initial Annotated Bibliography

[1] TensorFlow. Tensorflow homepage. https://www.tensorflow.org/. Accessed February 2021.

[2] PyTorch. Pytorch homepage. https://pytorch.org/ . Accessed February 2021.

[3] WordPress. Wordpress homepage. https://wordpress.com/ . Accessed February 2021.

[4] GitHub. The homepage of Github. https://github.com/. Accessed February 2021.