

Group 29
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COMP3106
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Project Proposal

Introduction of problem

All images fall on an accessibility spectrum, ranging from inaccessible to accessible. Image accessibility in this case being the measure of how groups of people with differing vision health and vision disabilities can see and interpret the content of an image. This type of accessibility is becoming of increased importance, and having a program that can grade the accessibility of an image could enable communities to increase accessibility and inclusivity.

Proposed objectives

Our objective is to create an artificial intelligence system that can rank the accessibility of an image, telling the user if the image could be hard to interpret for people with visual disabilities. Examples of this could be text that is either too small or blurry, or sets of colors that are difficult to see on different colorblind spectrums. With this A.I. tool, users can validate that their graphical works are suitable for all that might see them, or know that certain things should be tweaked before confirming their design.

Proposed methods

As our proposed idea requires both image classification and optical character recognition, we foresee the methods mentioned in the project ideas fitting this task. That involves a recognition pipeline involving feature extraction and Bayes theorem to classify any text characters in the image, as well as a convolution neural network to evaluate the colors chosen in the image.

Dataset to be used

We plan to get our set of accessible and inaccessible images from a public dataset. We have not determined the size of the dataset at this time, but we intend to have equal quantities of accessible and inaccessible images. We do not foresee doing any pre-processing of the image such as resizing or cropping, as we will want to have the full scope of the original image. Images will receive a label, this label being the accessibility score. As recommended in class, the training set will contain 60% of the image dataset, the validation set will contain ~20%, and the testing set will contain ~20%.

Proposed validation/analysis strategy

Our proposed validation strategy would involve training/validation/test sets, where we would take a portion of our dataset and rank them based on their accessibility. The ranking could be as follows: 1 - The image is suitable both in colors and text used. 2 - The image has suitable usage of text, but could have better contrast in colors. 3 - The image has suitable usage of colors, but could have clearer text. 4 - The image is not suitable in both color and text.

Description of project novelty

While this project deals with image classification, a very common task, our proposed idea is novel due to its ability to help a marginalized group.

Weekly schedule

We have about 8 weeks remaining in the semester:

Week 8:

- Await feedback, Project planning

Week 9:

- Find dataset, create training set

Week 10:

- Reading week

Week 11:

- Research methods

Week 12:

- Begin implementation

Week 13:

- Continue implementation, Model training and optimization

Week 14:

- Polish implementation, Project report

Week 15:

- Project report

Week 16:

- Polish, Demonstration, Project due

Demonstration availability

Our best availability for project demonstration are Monday and Wednesday after 12pm, and Tuesday and Thursday after 2pm.

Required GPU access

We do not foresee requiring any access to GPU resources through the School of Computer Science.