



COMS4036A & COMS7050A

Computer Vision

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Lab 5: Understanding Your Data

Due: 13 October 2021 @ 14:00

Overview

Last year Quarantino asked all the Computer Vision students to help label the data. Everyone in the class created masks for 3 images of puzzle pieces and submitted them back to him. The puzzle only has 48 pieces, but Tino wanted to be sure that we could trust the masks before we train our models with them. This way, each puzzle piece has been labelled by a few different people.

He has renamed the images to be `./images/image-ImageNumber.jpg` and all of the masks to be `./masks/mask-ImageNumber-MaskNumber.png`. The `ImageNumber` and `MaskNumber` are arbitrary, but consistent.

Tino is unsure how we should combine all these different masks into a final mask that we can use for training and validation. He needs your help understanding and cleaning the data that we have gathered.

1 Task

You can download a zip file with all the images and masks from https://courses.ms.wits.ac.za/~richard/cv/puzzle_data.zip.¹ Your task is to:

- Investigate the training data, comment on how to clean, resize and preprocess the data for training, and comment on various issues that might emerge during training or as a result of this preprocessing.
- Investigate and comment on the quality of the labels. Look up how you might quantify inter-rater reliability and how you would usually assess the agreement between different sources of labels.²
- Motivate why you choose the agreement metrics that you did, and analyse what they tell you about the dataset and labels.
- Suggest to Tino, based on your results, how you think he should construct the ground truth dataset.

¹Note that the file is 200MB, but Moodle is still zero-rated.

²How would you usually compare models?

2 Submission

Write a short report using the IEEE \LaTeX conference format.³ It may be no longer than 2 pages, although you may have an appendix with figures and tables. You will be graded based on your quantitative and qualitative analysis of the data, as well as your writing style and document presentation. Ensure that you separate your work into coherent sections and that the structure of the document makes sense. Marks are awarded for showing insight into why we are cleaning the labels and how this fits into the broader context of making a puzzle solver. In addition please comment on problems that may arise during your described process and as well as any assumptions you make about the data. It is more important to be precise about your process, rather than proposing an elaborate or complicated process. Lastly, you do not need to implement your proposed process, however, examples and demonstrations can help with clarity and this is what the appendix can be used for.

³<https://www.ieee.org/conferences/publishing/templates.html>