Project 2

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Most Classified Class

The class "no pain" was the most classified in both testing scenarios, with 128x128 and 64x64. With the 64x64 test, the classification of pain and no pain were similar, but on the 128x128 there were a lot of miss-classification. The accuracy of the 64x64 test, 0.68, is higher than the accuracy of the 128x128, which is 0.54. This could be because training the neural network with less range on a face analysis could make the model concentrate on more important features and would not get confused as much. Also, even though there were the same amount of pain and no pain input pictures, the face identification in pain images is more difficult and, in consequence, there were less training cases for pain classification.

Metrics

The test with 64x64 has better accuracy and therefore it also has better precision, recall and f1-score. Even though we get a general idea of how well our recognition system is doing with the accuracy, with multiple metrics like precision, recall and f1-score we can identify where our system can be improved. For instance, if the recall is low, we know our system is failing to recognize pain. We could have a high accuracy with low recall or precision. So we need multiple measurements to have a better understanding of the prediction model.

Classify Pain Based On Images

Based on the accuracy values from both tests, using only images to identify pain is not recommended. The highest accuracy that we got, 0.68, is low. We could add more types of information to improve the system. Using more types of inputs will help the prediction model recognize pain better.

Compared Results With Project 1

Using several types of physiological data in project 1 resulted in a higher accuracy, of 0.9, compared to the result of using only images. This makes sense because in project 1 we used multiple signals to train the model to identify pain, which is better than training a model using only one type of input like, in this case, images.

High Recall vs High Precision

In our case, where we want to recognize pain in order to treat it quickly, I think recall is more important. This is because we would want to identify most, if not all, of the subjects that are in pain, even if we miss-treat some subject with no pain.

Appendices

Appendix 1: Script Output 128x128

	No Pain	Pain
Precision	0.55	0.53
Recall	0.79	0.26
F1-Score	0.65	0.35

Loss	3.444
Accuracy	0.54

Confusion	1001	263
Matrix	821	293

Appendix 2: Script Output 64x64

	No Pain	Pain
Precision	0.71	0.66
Recall	0.69	0.67
F1-Score	0.7	0.67

Loss	4.125
Accuracy	0.68

Confusion	877	387
Matrix	366	748