

Knee Osteoarthritis Classification

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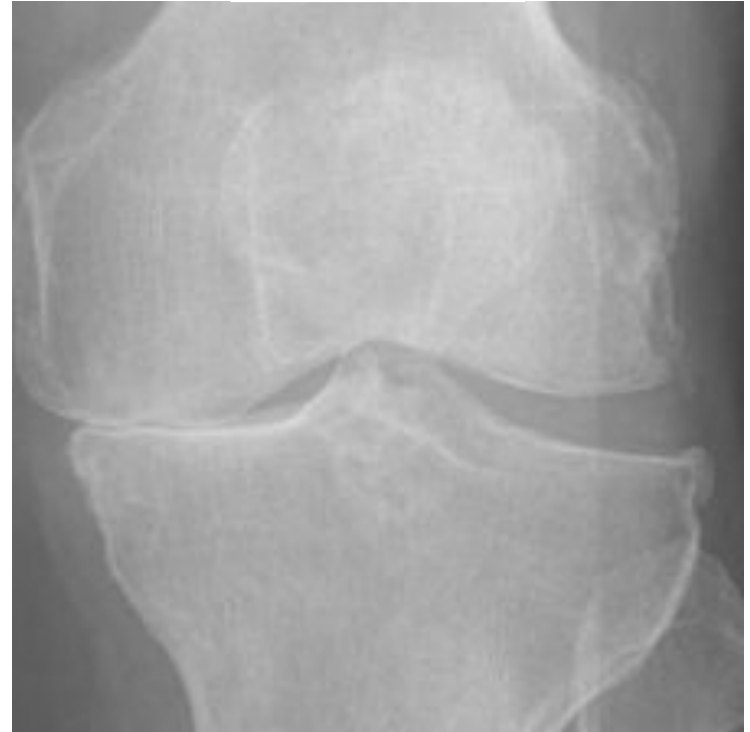
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Introduction

46%

clevelandclinic.org

- Cause painful to jog, run, climb stairs or kneel
- Make knee stiff or swollen
- Change knee joint overtime
→ unstable or wobbly



Dataset

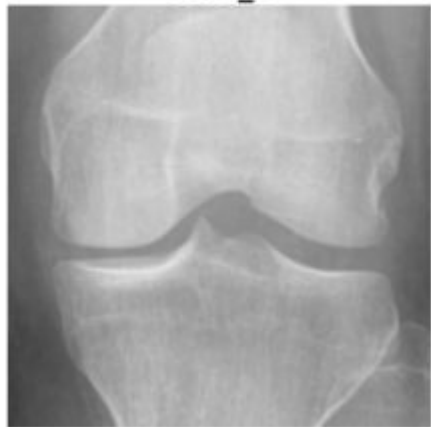
5 Classes: 5778 (training)-1656 (testing)

0: Healthy
1: Doubtful
2: Minimal
3: Moderate
4: Severe

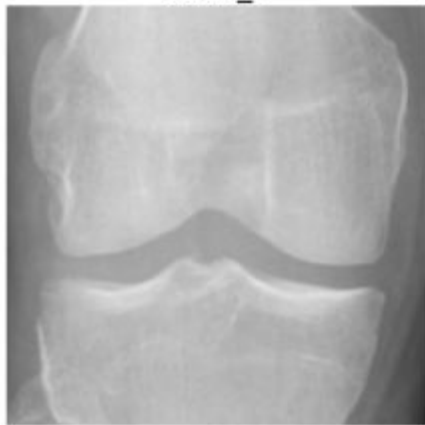
Class-Data distribution



class_0



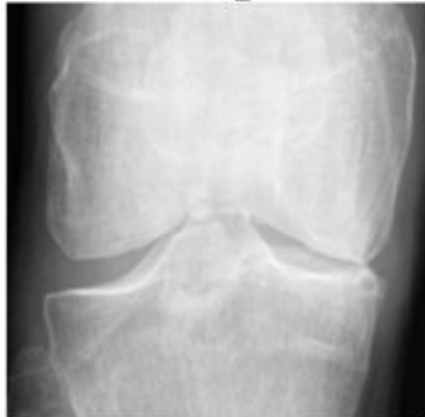
class_1



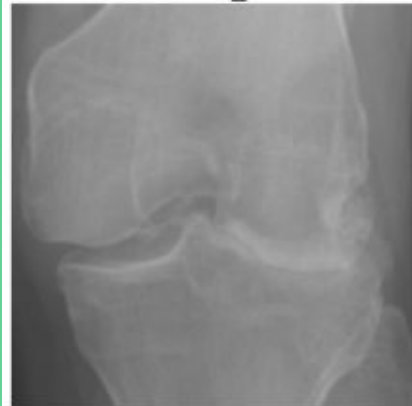
class_2



class_3



class_4



Methodology

Augment data: Flip, shift, rotation and random erasing

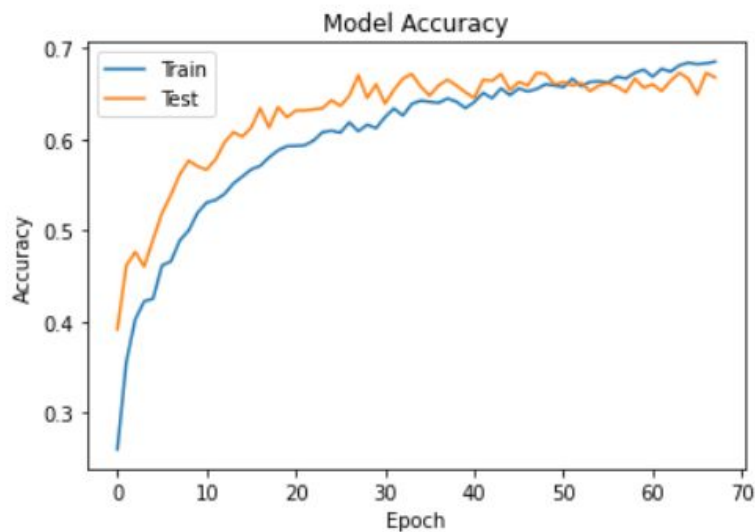
Applied transfer learning model using DenseNet201



Results

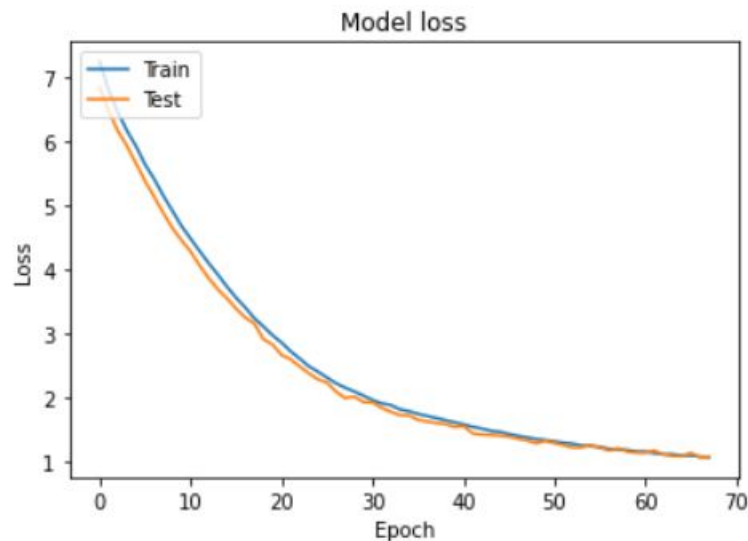
train_accuracy: 0.6848

val_accuracy: 0.6675

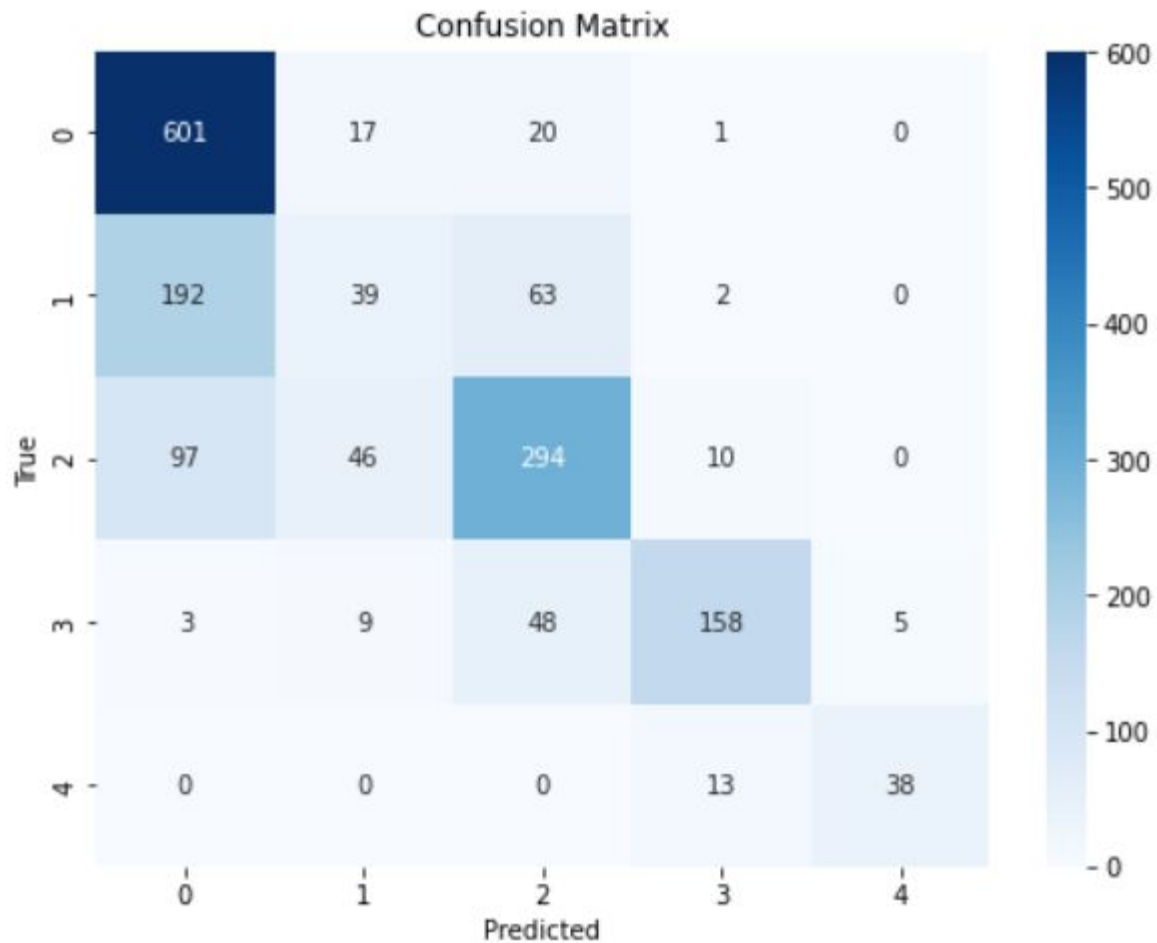


train_loss: 1.0832

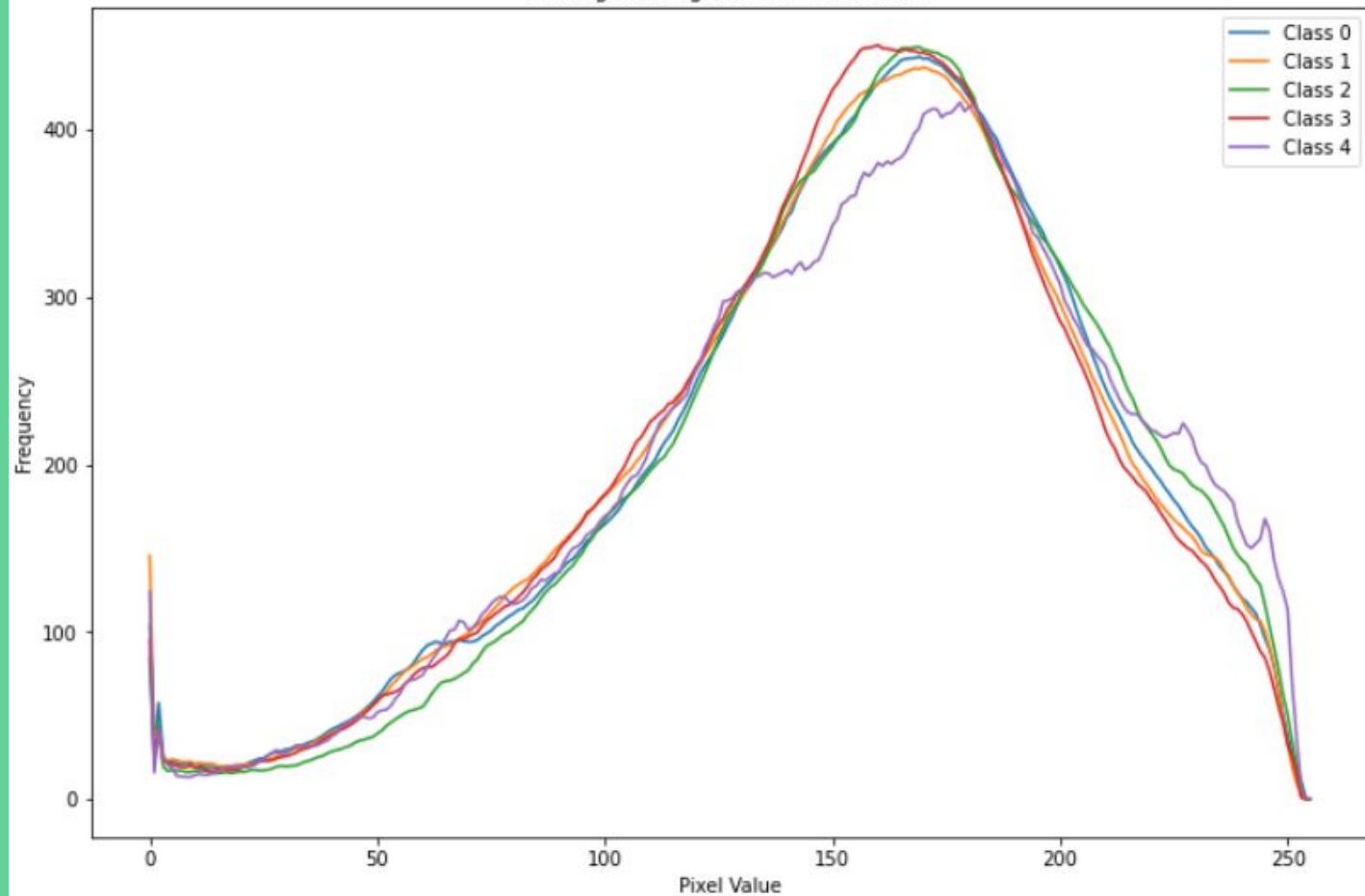
val_loss: 1.0903



Results



Average Histograms for Each Class



Conclusion

Still confused among class 0, 1, 2

→ need more input data

Future Work

Find more data for all classes

Applied new techniques such
as: combining object detection
with classification



References

<https://my.clevelandclinic.org/health/diseases/21750-osteoarthritis-knee>

<https://www.kaggle.com/datasets/shashwatwork/knee-osteoarthritis-dataset-with-severity>

Thank you for your listening!

Do you have any questions?

