Knee osteoarthritis detection and classificatin using X ray

Requirements:

- MLops implementation in project
- Chabot
- Change the frontend design and make it somewhat 3d animation
- Investigate the following in project:
  1. Imbalanced data. Which approach and why was it better
  2. Data leakage. How to solve and handle it
  3. Hallucinations
  4. Novelty.
  5. Responsibility: Why must I trust your work
  6. Explainability(beyond GradCAM,SHAP & Lime)
  7. Evaluation matrix's(beyond kappa,accuracy,precision,recall,etc)
  8. Expert Opinion(by domain expert)
  9. Reproducibility
  10. Mathematical modelling on relevant algorithm
- Also implement using below images

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TABLE 4. Results- confusion matrices and ROC curves.

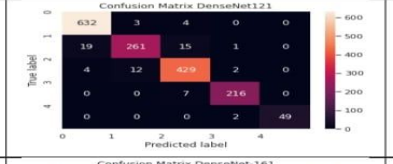
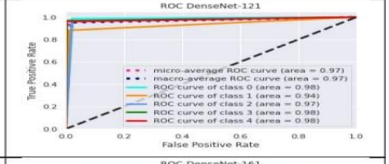
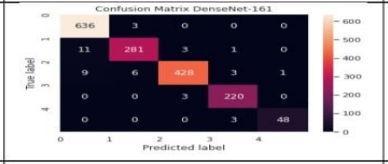
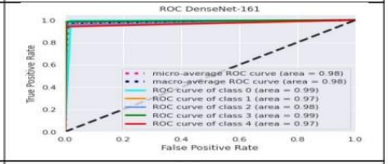
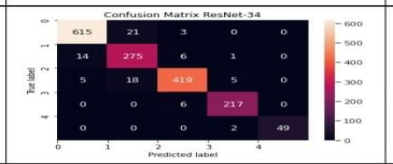
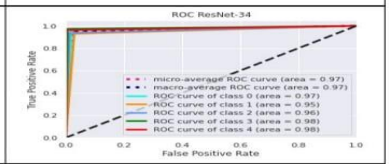
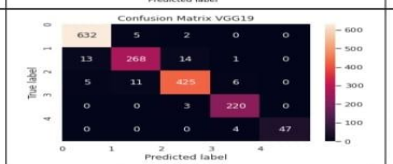
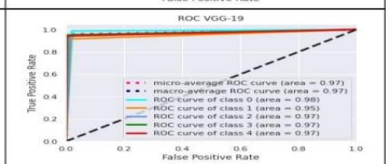
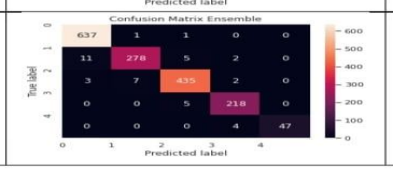
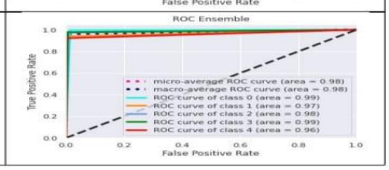
Model	Confusion Matrix	ROC-AUC
DenseNet-121		
DenseNet-161		
ResNet-34		
VGG-19		
Ensemble		

TABLE 5. Eigen-CAM visualization all models.

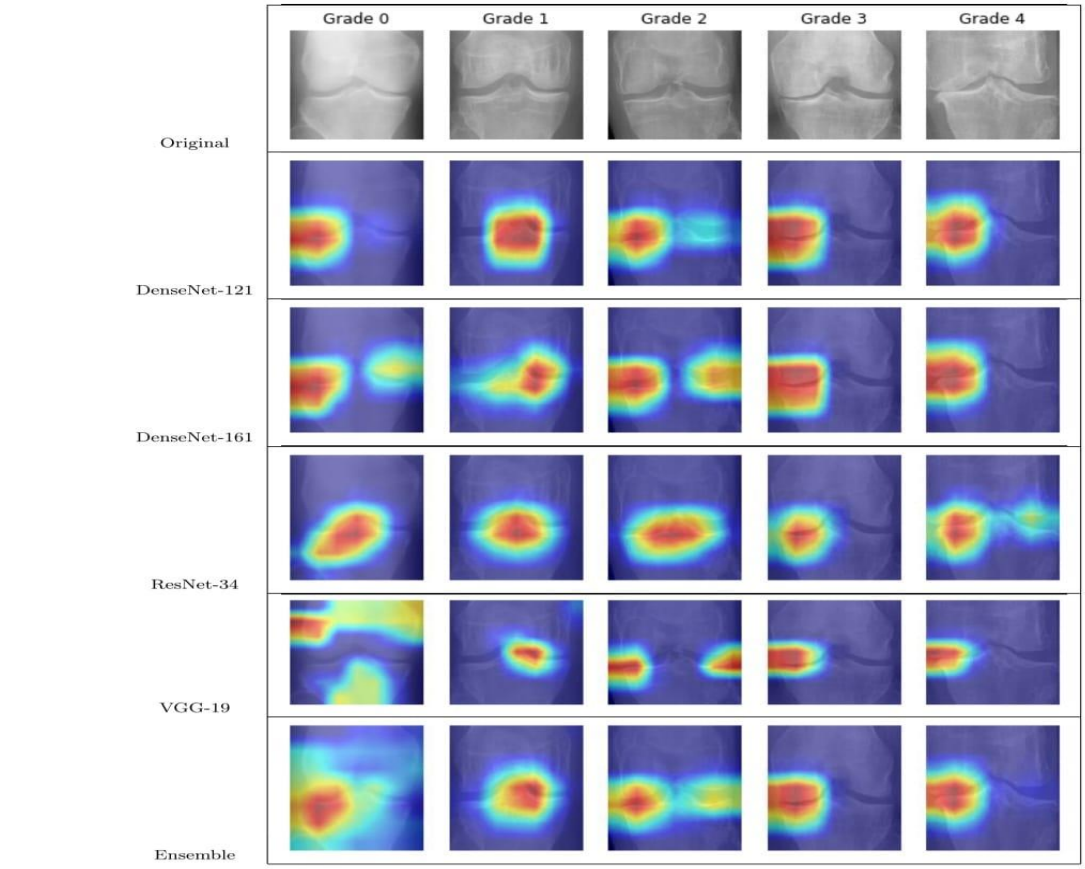


TABLE 1. Kellgren and Lawrence's grading (KL) grading scheme.

Image	Grade Description
	Grade 0 (Normal) is assigned to normal bones and no symptoms on X-rays.
	Grade 1 (Doubtful) depicts doubtful JSN and the possibility of osteophytes.
	Grade 2 (Mild) specifies definite osteophytes and possible JSN.
	Grade 3 (Moderate) indicates multiple osteophytes with possible bone deformity.
	Grade 4 (Severe) shows large osteophytes, definite JSN, and severe sclerosis.