

Deep Learning Project: ACL Tear Classification using Axial MRI Slices

Project Overview

This project focuses on classifying ACL tears from axial MRI slices using deep learning techniques. By leveraging pre-trained models and custom architectures, the goal is to accurately identify ACL tears for medical diagnosis.

Dataset

- **Input:** Axial MRI slices of the knee.
- **Classes:** Normal, ACL Tear.
- **Training/Validation/Test Split:** Stratified split ensuring balanced representation of ACL tears across splits.

Model Architecture

- Utilizes advanced convolutional neural networks such as InceptionV3, InceptionResNetV2, and EfficientNetB0 for feature extraction.
- Custom layers including GlobalMaxPooling2D and Dense layers are added for fine-tuning and classification.

Training

- The models are trained using a binary classification setup with Adam optimizer and learning rate scheduling.
- Custom callbacks track performance metrics such as F1 score and confusion matrices.