Team Members	Roles
Kiran J	Data Preprocessing and Augmentation
Naveen Kumar S	Model Training and Evaluation Feature Extraction and Analysis Architecture Design and Model Creation

Problem Statement

- Manual interpretation of X-ray images by radiologists is time-consuming and prone to human error.
- Variability in radiologists' expertise may lead to inconsistencies in diagnosis, affecting treatment outcomes.
- Delays in diagnosis can impact critical treatment timelines, potentially compromising patient care.
- The rising demand for rapid and accurate fracture detection has highlighted the limitations of manual methods.

(cont..)

Problem Statement

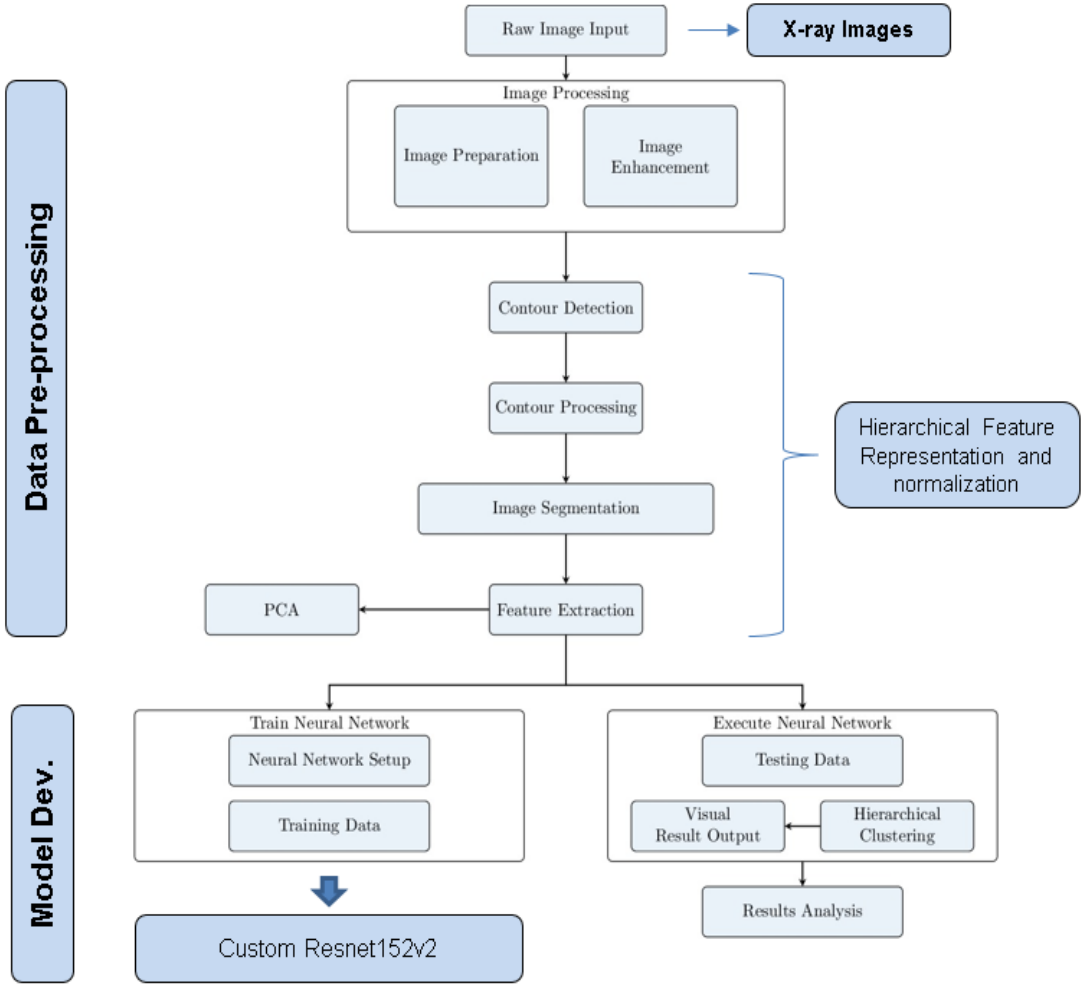
- An automated diagnostic system can significantly reduce interpretation time, improve accuracy, and standardize fracture detection across diverse medical settings.
- Automation can streamline diagnostic workflows, alleviate the burden on radiologists, and enhance patient outcomes by enabling faster intervention.
- Reducing the reliance on human expertise mitigates the risk of misinterpretation and ensures more consistent diagnostic results.

Osteo-Synergy

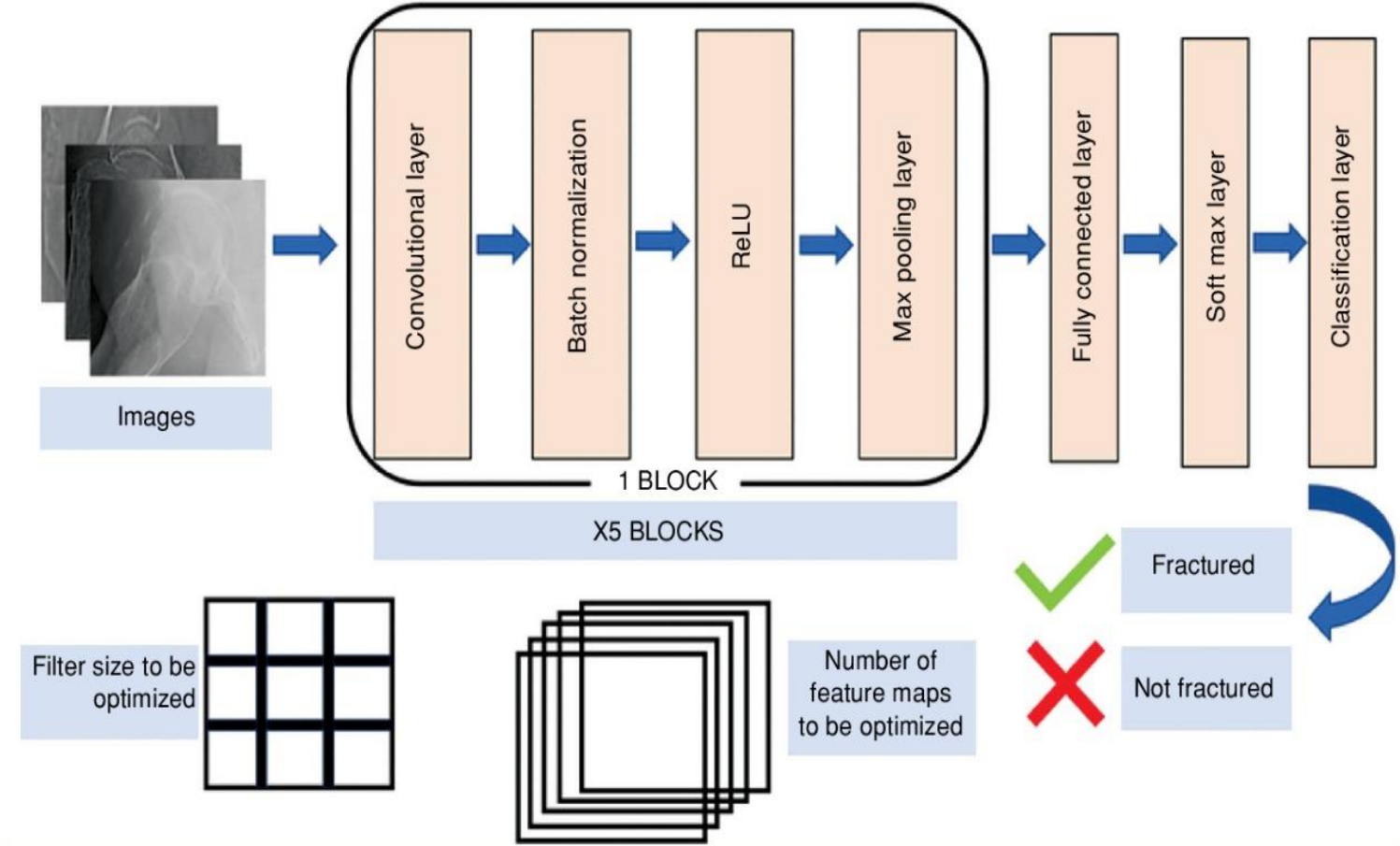
An Automated Osteo Fracture Detection System Supported by Azure ML Studio

Solution

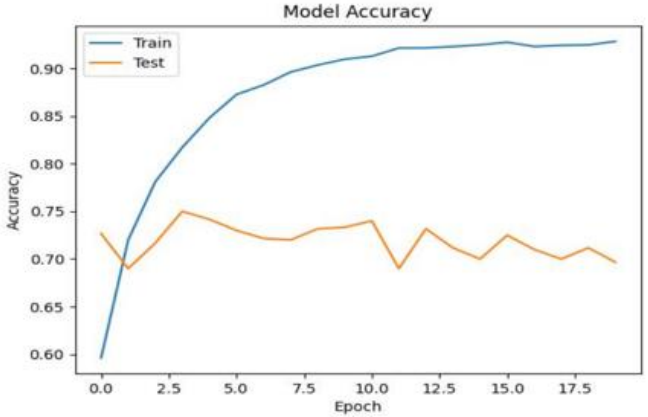
- ResNet152V2 Model for advanced fracture detection capabilities.
- Custom residual blocks enhancing fracture pattern recognition.
- Data preprocessing ensuring high quality input for model.
- Hierarchical feature extraction for precise localization analysis.
- Real-time diagnostics improving patient care and treatment.

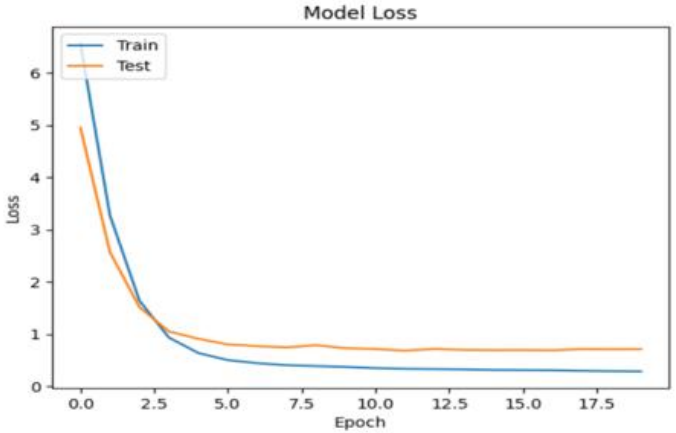


Architecture Diagram :



Final Results :





Wow factors

- ✓ **Innovative Neural Architecture**: Combines the powerful ResNet152V2 model with custom residual blocks, optimizing fracture detection capabilities.
- ✓ **Efficient Training Mechanism:** Utilizes residual learning to alleviate vanishing gradient issues, facilitating faster convergence during training.
- ✓ **Comprehensive Data Preprocessing.**
- ✓ **Hierarchical Feature Representation** and **Subtle Pattern Recognition.**
- ✓ Leverages the robust capabilities of **Azure ML Studio for seamless deployment**, ensuring scalability and high performance in real-world healthcare environments.

Learnings during the Datathon

- **Team Collaboration**: Enhanced communication and teamwork skills through diverse perspectives.
- **Data Preprocessing**: Gained expertise in normalization, augmentation, and dataset cleaning.
- **Model Selection**: Learned to choose and fine-tune machine learning models effectively.
- **Deep Learning Frameworks**: Hands-on experience with TensorFlow for model development.
- **Feature Engineering**: Developed skills in extracting and selecting relevant features.
- **Performance Metrics**: Understood evaluation metrics like accuracy, precision, and recall.
- **Time Management**: Improved ability to prioritize tasks under tight deadlines.
- **Real-World Application**: Bridged theory with practical applications in data science.