

TEAM NAME : **SAV04 IBM_MAESTROS**

Team Members	Roles
Sanjay S	Data Preprocessing and Augmentation
BarathKumar J	Feature Extraction and Analysis
Naveen Kumar S	Architecture Design and Model Creation
Manoj M	Model Training and Evaluation
Anto Richard S	Deployment and Integration
Guru Prased D	Documentation and Reporting

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
LinuxOne

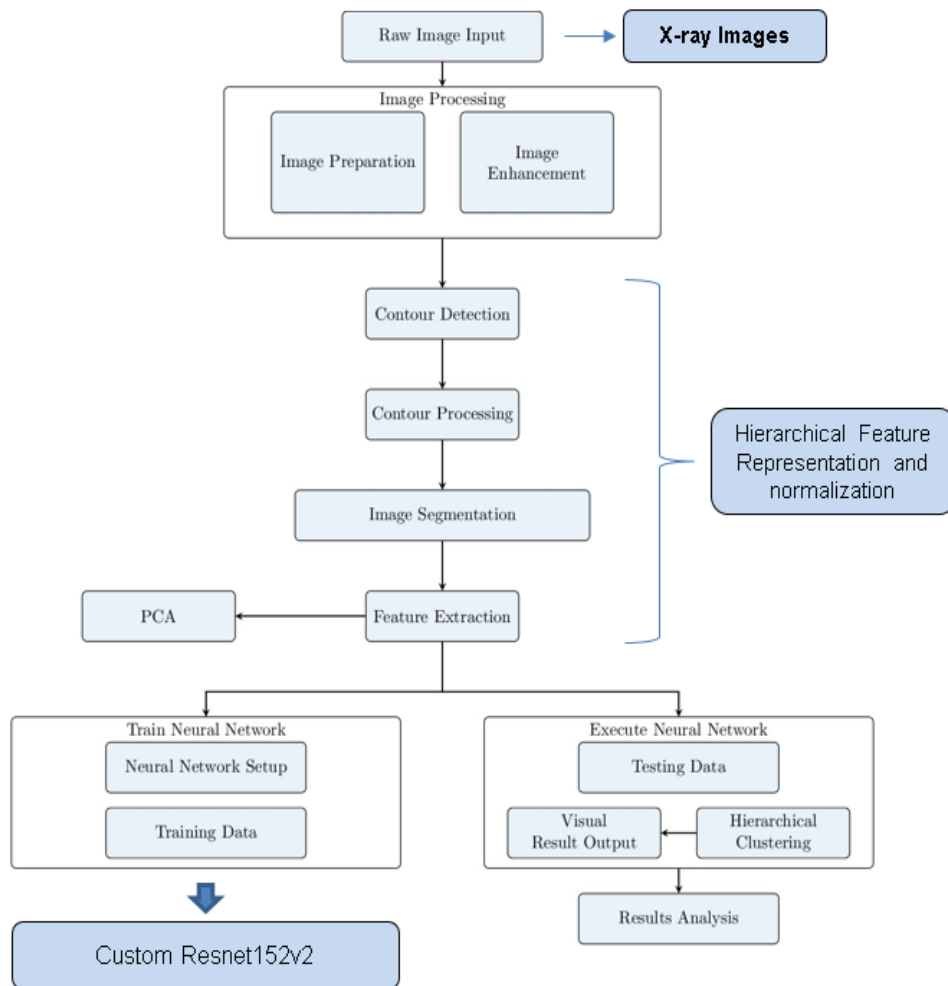


Solution

- 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.
- Deployment on IBM LinuxOne for scalable performance.
- Real-time diagnostics improving patient care and treatment.

Data Pre-processing

Model Dev.



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 **IBM LinuxOne 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.