Bone Fracture Classification based on X-ray images using Machine Learning

Shahad Alhassani   Nuran Alharbi   Shahad Baharthi   Walaa Alslimani
Supervised by : Dr. Hind Hazaa Alsharif

College of Computers, Department of Computer Science and Artificial Intelligence
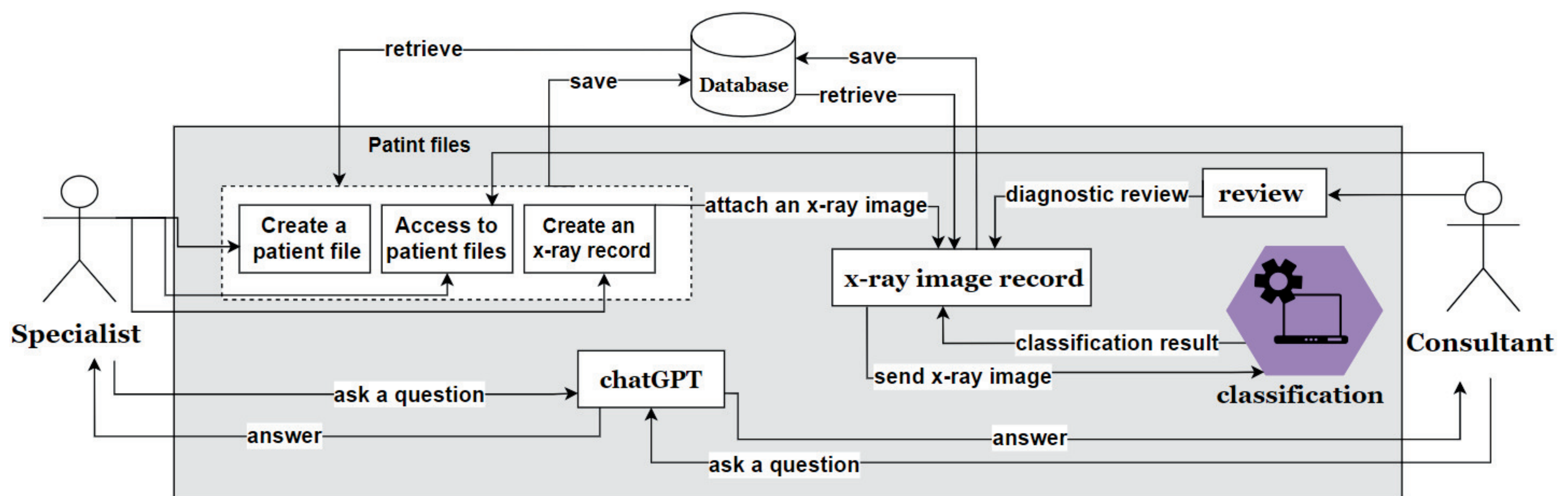
جامعة أم القرى
UMM AL-QURA UNIVERSITY

شعاع

Abstract

Through our observation, we have found that some hospitals are facing a shortage in the field of medical imaging, particularly in providing rapid diagnoses. This led to our idea of assisting consultants in swiftly diagnosing cases using deep learning algorithms to process and classify X-ray images. Additionally, we have incorporated ChatGPT to aid consultants and specialists in responding to their inquiries.
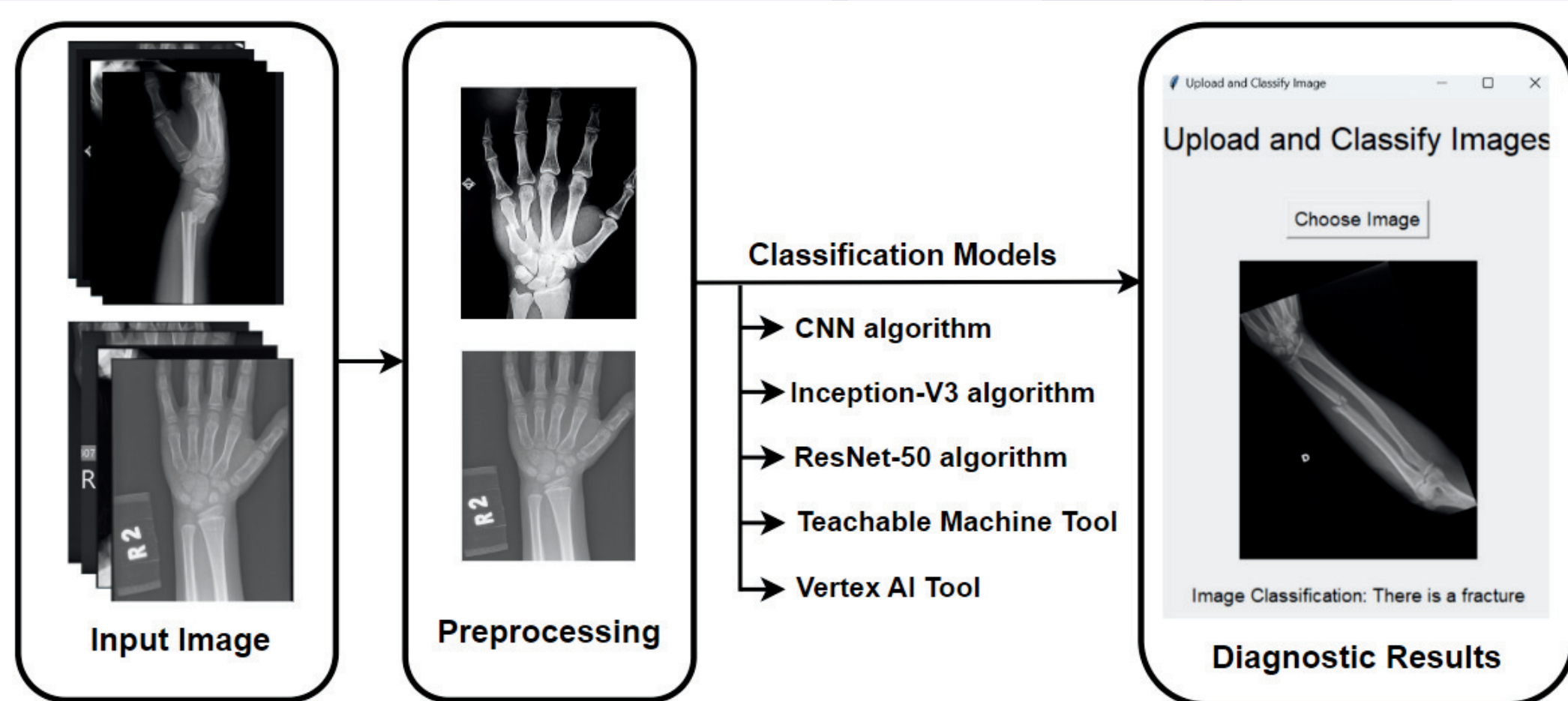
Objective

- Improving the quality of healthcare by assisting specialists and consultants in the diagnostic process.

- Utilizing deep learning algorithms to analyze and classify medical X-ray images.

- Adding ChatGPT technology to answer queries from specialists and consultants.
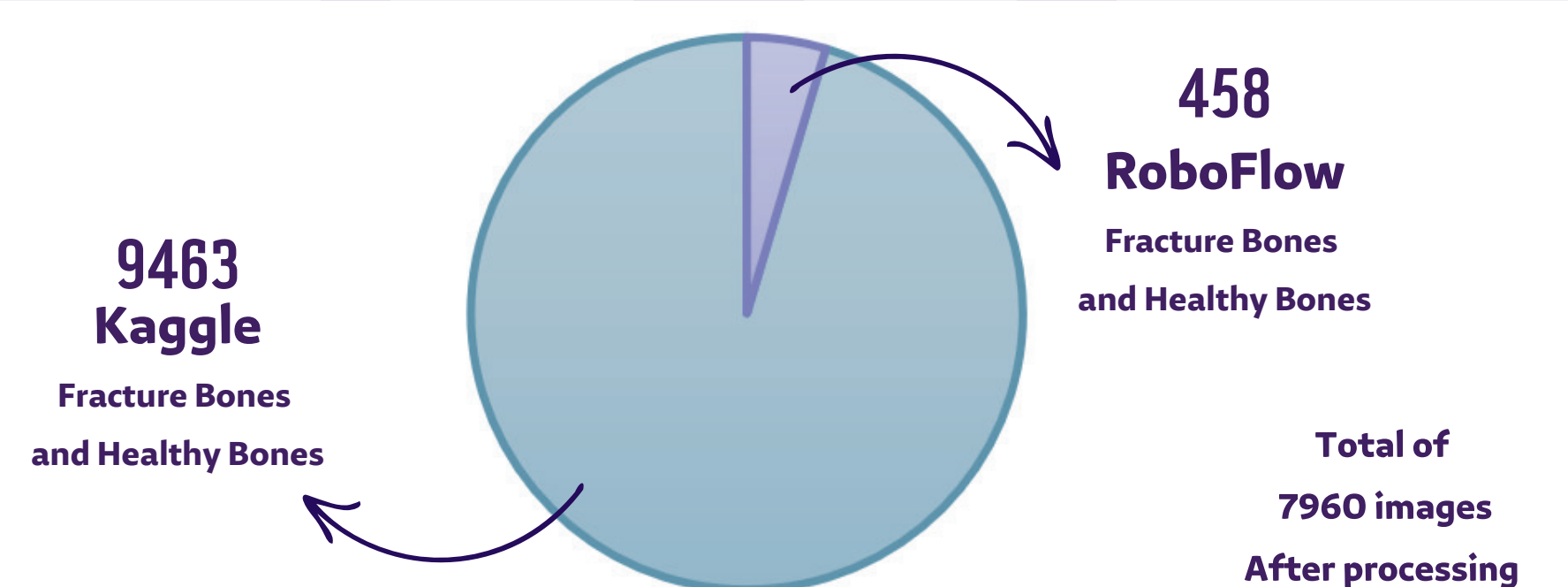
General Architecture

Cassification

Classification Models
→ CNN algorithm
→ Inception-V3 algorithm
→ ResNet-50 algorithm
→ Teachable Machine Tool
→ Vertex AI Tool

Input Image   Preprocessing

Upload and Classify Images
Choose Image
Image Classification: There is a fracture
Diagnostic Results

Dataset collection

458
RoboFlow
Fracture Bones and Healthy Bones

9463
Kaggle
Fracture Bones and Healthy Bones

Total of 7960 images After processing

Result

84%   88%   94%   76%   97%

Accuracy ratio

- CNN algorithm
- ResNet-50 algorithm
- Inception-V3 algorithm
- Teachable Machine Tool
- Vertex AI Tool

Future work

Include all types of fractions

Specify the position of the fracture

Specify the expected duration of treatment
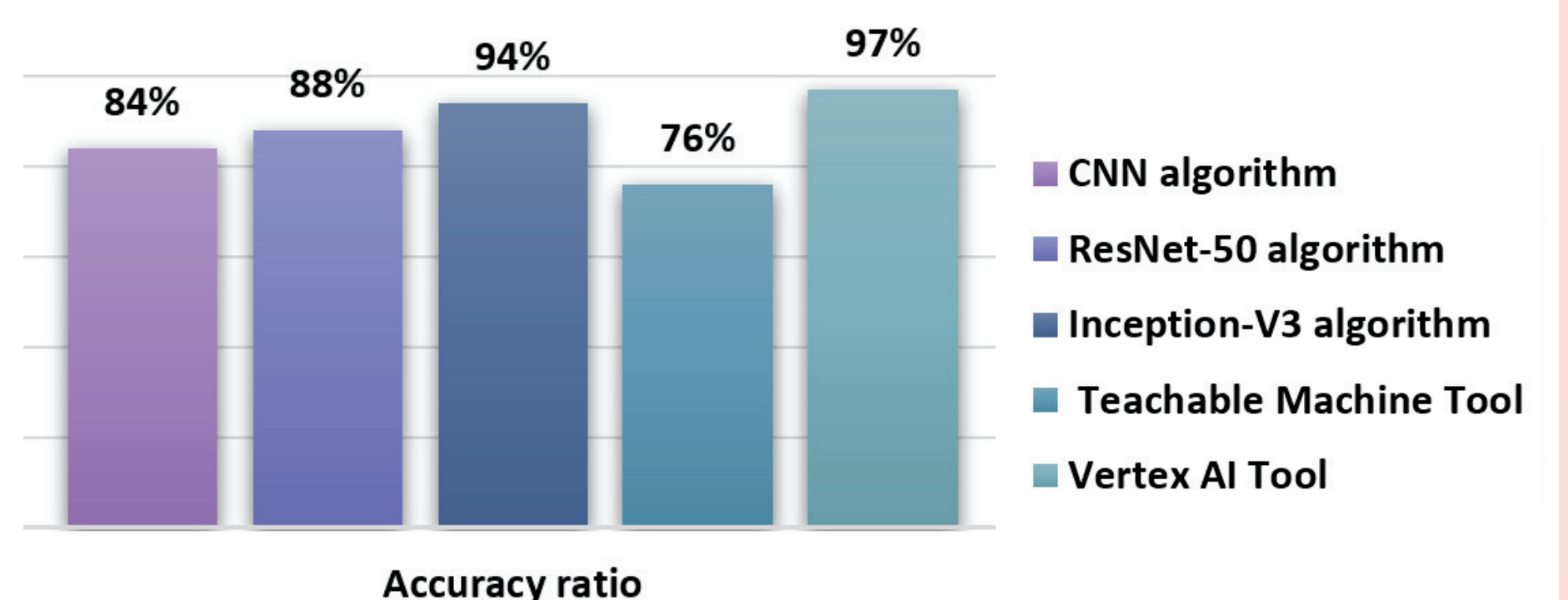
Tools

References and Contact

Contact

References