

Kyphosis Detection System

This project introduces a web-based Kyphosis Detection System that uses machine learning algorithms and Streamlit. The system predicts whether a patient has kyphosis based on their medical characteristics. The application provides a user-friendly interface where users can input their details and receive an instant prediction of their kyphosis status.

The system enhances accessibility for users without technical expertise and aids in early detection and intervention for kyphosis management. The model achieved high accuracy, demonstrating strong predictive capability.

 by Peace Adamu



Project Objective and Significance

Objective

Develop a machine learning-based web application that predicts kyphosis based on spinal characteristics.

Significance

- Provides quick and reliable kyphosis prediction.
- Enhances accessibility for users without technical expertise.
- Uses machine learning to improve prediction accuracy.
- Aids in early detection and intervention for kyphosis management.

Key Features for Prediction



Age

Age of the patient in months.



Number

Number of vertebrae involved in the curvature.



Start

The starting vertebra of the curvature.



Project Methodology

1

Data Collection

Dataset containing kyphosis patient records.

2

Data Preprocessing

Cleaning, normalization, and feature selection.

3

Model Training

Machine learning model trained on labeled data.

4

Model Evaluation

Performance assessed using precision, recall, F1-score, and confusion matrix.

5

Web Application Deployment

Model integrated into a Streamlit web app for easy accessibility.

Prerequisites and Web Application Usage

Prerequisites

- Python 3.13.0
- Streamlit 1.42.2
- Scikit-learn 1.6.1
- Joblib 1.4.2

Web Application Usage

1. Install required packages: `pip install streamlit scikit-learn joblib`
2. Run the app: `streamlit run app.py`
3. Input patient data and click the Predict button to get the prediction result.

Discussion of Results

High Accuracy

The model achieved high accuracy, demonstrating strong predictive capability.

Exceptional Performance

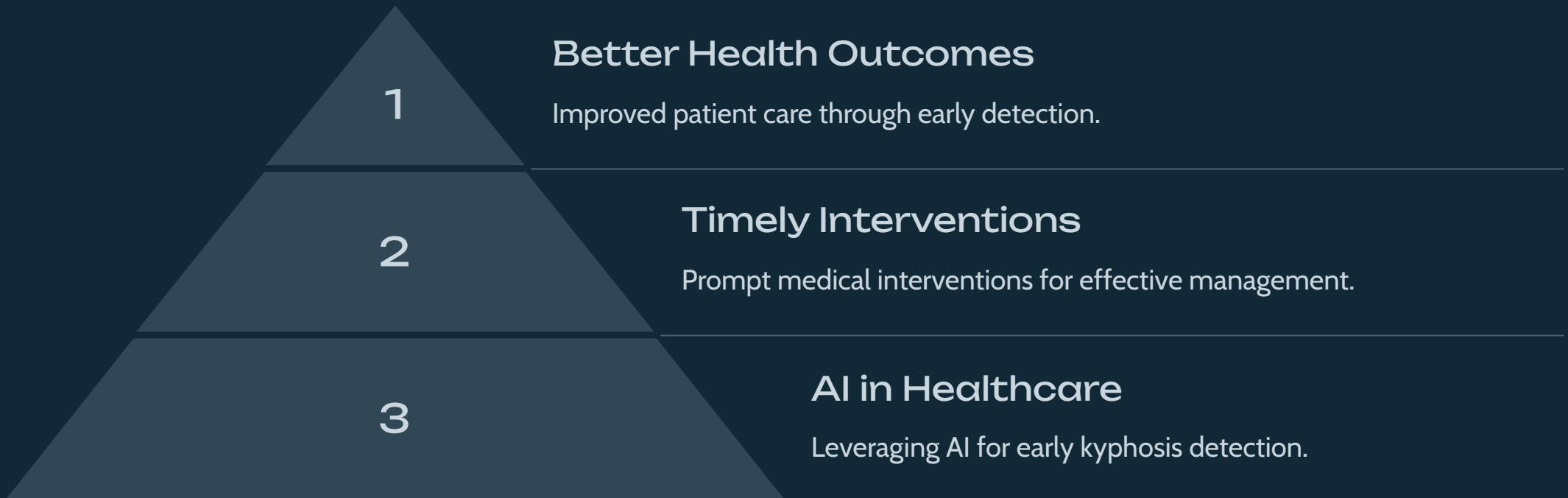
The model shows exceptional performance with an accuracy of 100% on the test set.

Effective Distinction

The classification report and confusion matrix confirm that the model effectively distinguishes between kyphosis presence and absence.



Impact of the Kyphosis Detection System



Deployment and Accessibility

This app has been deployed with Streamlit, making it easily accessible to users. The system is an important step towards leveraging AI in healthcare for early kyphosis detection, which can lead to timely medical interventions and better health outcomes for individuals.

You can access it here: <https://kyphosis-prediction-app-pwgrqpzbyzcmhyi3ah2w6d.streamlit.app/>

