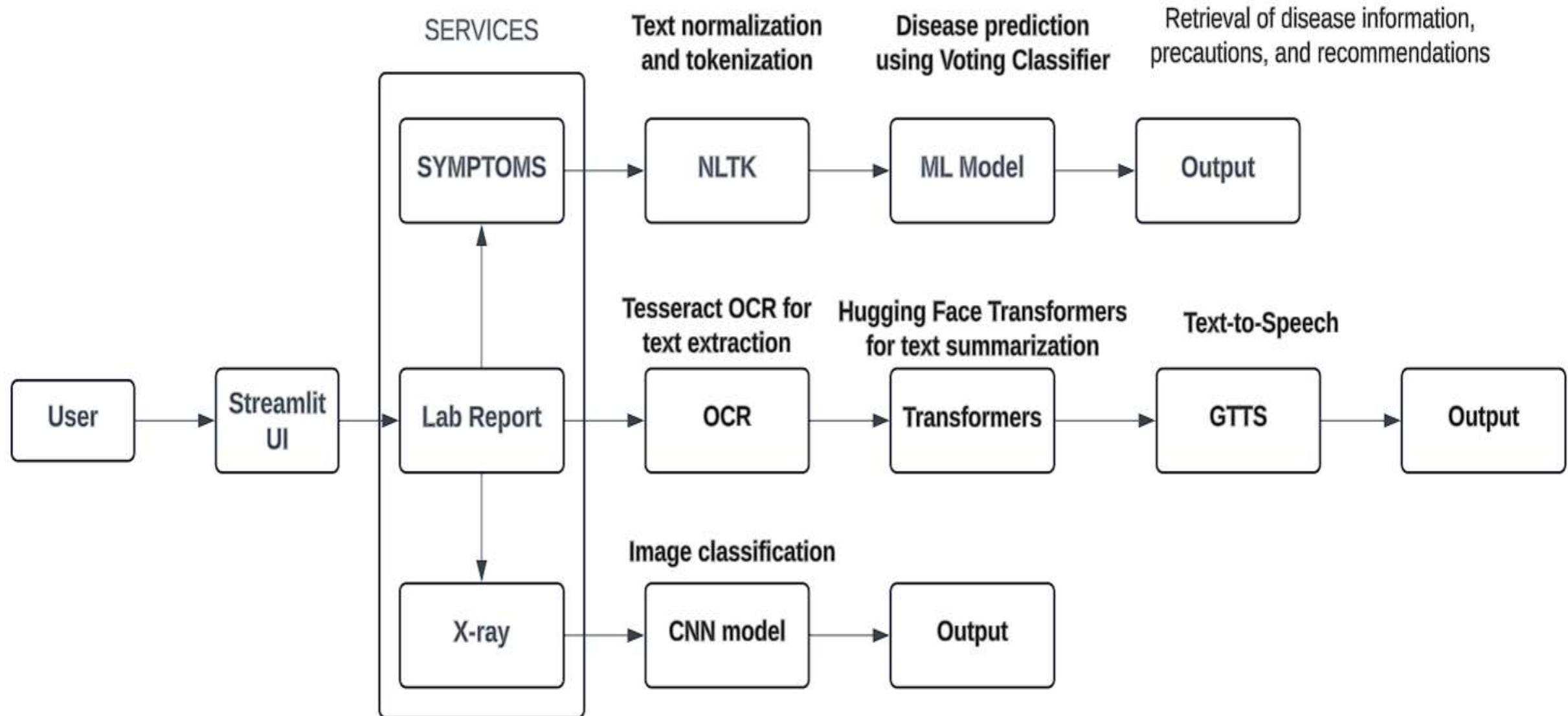# BAYMAX *: Personal Medical Assistant*

SYSTEM ARCHITECTURE

BAYMAX

- Home
- **Symptoms**
- Lab Report
- X-Ray Report

Symptom-based Medical Prediction

Enter Symptoms (comma-separated):

Predict

BAYMAX

- Home
- Symptoms
- **Lab Report**
- X-Ray Report

OCR Lab Report Analysis

Upload an image file to extract text using OCR.

Choose an image file...

Drag and drop file here
Limit 200MB per file • PNG, JPG, JPEG, BMP

Browse files

Screenshot 2024-09-26 172846.png 68.7KB

Yash M. Patel
Age : 21 Years
Sex : Male
PID : 555

Sample Collected At:
125, Shivam Bungalow, S G Road,
Mumbai
Ref. By: **Dr. Hiren Shah**

Registered on: 02:31 PM 02 Dec, 2X
Collected on: 03:11 PM 02 Dec, 2X
Reported on: 04:35 PM 02 Dec, 2X

PERIPHERAL BLOOD SMEAR EXAMINATION

Investigation	Result	Reference Value	Unit

Pneumonia classification

Please upload a chest X-ray image

BAYMAX

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Drag and drop file here
Limit 200MB per file • JPEG, JPG, PNG

Browse files

NORMAL2-IM-1427-0001.jpeg 247.2KB ✕

R

SYMPTOM-BASED PREDICTION

- **The symptom-based prediction feature allows users to input their symptoms to receive potential diagnoses and tailored recommendations.**

- **It leverages machine learning to analyze input data and provide accurate results.**

HOW IT WORKS :

Step 1: User inputs symptoms in a comma-separated format (e.g., fever, cough).

Step 2: The system normalizes symptoms through:
   Tokenization: Breaks symptoms into individual words.
   Stop Word Removal: Filters out common words (e.g., "and," "the") that do not   add value.
   Stemming: Reduces words to their root form (e.g., "coughing" becomes "cough").

Step 3: The normalized symptoms are matched with a predefined symptoms dictionary.
     Handling Spelling Mistakes: The system employs fuzzy matching to account   for minor spelling errors, ensuring that similar-sounding or misspelled   symptoms are correctly identified.

Step 4: The model predicts the disease based on the input vector created from the matched symptoms.

Step 5: receive a potential diagnosis and tailored recommendations

LAB REPORT ANALYSIS

The OCR Lab Report Analysis feature allows users to upload an image of their lab reports. The system processes the image to extract relevant text, summarize it, and highlight key information using advanced NLP techniques.

BAYMAX

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Hiren Shah (PERSON)

Normachrami (ORG)

Norma (PERSON)

Mumber (PERSON)

Summary of Extracted Text:

Text Summary

"Peripheral BLOOD SMEAR EXAMINATION" was the subject of a blood test . The blood sample was collected at Siuvar Bungalow, 86 Road, 86 road, in Mumber . The sample was taken from a blood sample taken from the blood sample .

Read Summary

0:01 / 0:18

- **Image Upload**: Users can upload images in various formats (PNG, JPG, etc.) of their lab reports.

- **Image Preprocessing**: The uploaded image is converted to grayscale and binarized to enhance OCR accuracy.

- **Text Extraction**: Optical Character Recognition (OCR) is performed on the processed image to extract text content.(PYTESSERACT)

- **Named Entity Recognition (NER)**: The extracted text is analyzed to identify and extract key information, such as dates, organizations, and quantities.(SPACY)

- **Text Summarization**: A summarization model, **"sshleifer/distilbart-cnn-12-6,"** condenses the extracted text into a concise summary. This model is a distilled version of the BART (Bidirectional and Auto-Regressive Transformers) architecture, specifically fine-tuned for the task of summarization.

- **Text-to-Speech Option**: Users can listen to the summary via a text-to-speech feature, enhancing accessibility and user experience.(GTTS)

X-RAY ANALYSIS

The system classifies chest X-ray images to detect the presence of pneumonia, utilizing a trained Convolutional Neural Network (CNN) model. The user uploads an X-ray image, and the model returns a prediction along with a confidence score.

Test Result: NORMAL

score: 34.0%

The pneumonia test result is normal. No signs of pneumonia detected.
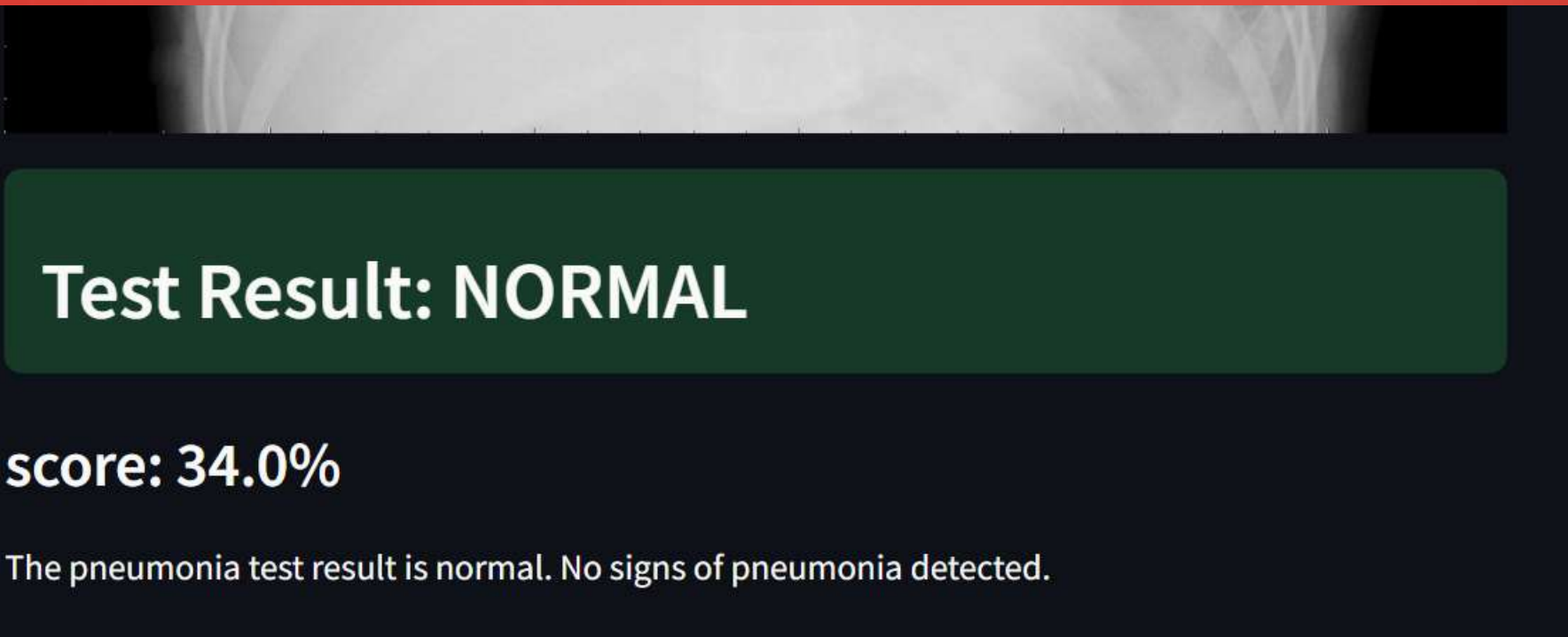
Step 1: User Uploads Chest X-ray Image
The user is prompted to upload a chest X-ray image in JPEG or PNG format.

Step 2: Model and Labels Loading
The pre-trained pneumonia classification model (xray_classifier.h5) is loaded, and class labels (e.g., "Normal", "Pneumonia") are read from a file.

Step 3: Image Preprocessing
The uploaded image is resized to (224, 224) pixels and normalized to fit the model's input requirements. This step ensures the image is in the right format for classification.

Step 4: Model Prediction
The preprocessed image is fed into the CNN model for classification. The model predicts whether the X-ray indicates "Pneumonia" or "Normal" along with a confidence score for the prediction.

Step 5: Displaying Results
The system displays the X-ray image along with the predicted class (Pneumonia or Normal) and the confidence score as a percentage

Future Enhancements for BAYMAX

Improve Accuracy of CNN model ,Better User Interface and Optimizing the System

User-Specific Monitoring:

- Tailor health insights based on individual user data and preferences.
- Implement adaptive algorithms that adjust recommendations in real-time.

Integration of Llama 3:

- Utilize Llama 3 for enhanced natural language processing capabilities.
- Improve user interactions and data interpretation through advanced AI models.

Deploy ⋮

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Symptom-based Medical Prediction

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THANK YOU

**PROJECT BY
RAJA PRASANNA M
PGA 22**