PROJECT WORKFLOW DOCUMENT

Multimodal Lung Diagnosis AI System

Separate Working Flow — Patient Interface & Doctor Interface

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1. PATIENT INTERFACE — SYSTEM WORKFLOW

1.1 System Entry

The patient accesses the web application and is presented with the following options:

- Symptom Checker
- Upload Medical Report (Chest X-ray + Clinical Text)
- View Diagnosis Result

1.2 Symptom Checker Flow (Quick Screening)

This feature allows patients to receive preliminary guidance without uploading medical images.

Workflow:

1. Patient enters symptoms into the system.
2. The frontend sends the symptom data to the backend API.
3. The Symptom Checker Module analyzes the input using rule-based logic or lightweight NLP.
4. The system generates a recommendation:
   - o   Low Risk → Monitor symptoms.
   - o   Medium/High Risk → Visit a doctor.
5. The result is displayed in simple, non-technical language.

1.3 Multimodal Diagnosis Flow (Full AI Processing)

Step 1 — Data Input

The patient uploads:

- Chest X-ray image.
- Clinical text report.

Step 2 — Preprocessing

- Image preprocessing: resizing, normalization.
- Text preprocessing: cleaning, tokenization, embedding.

Step 3 — Feature Extraction

Two AI models operate independently:

- Image Model extracts visual features from X-rays.
- Text Model extracts contextual features from clinical reports.

Step 4 — Multimodal Fusion

The system combines image features and text features into a unified representation for improved understanding.

Step 5 — Prediction Engine

The AI model predicts:

- Lung disease category.
- Severity level.

Step 6 — Explainability Module

The system generates:

- Heatmaps highlighting affected lung regions.
- Textual explanations describing the prediction.

1.4 Database Storage

After prediction, the backend stores the following information:

- Patient details.
- Uploaded reports.
- Prediction results.
- Timestamp information.

This enables future doctor access and report tracking.

1.5 Patient Mode Output

The patient interface displays:

- Simplified diagnosis summary.
- Easy-to-understand explanation.
- Guidance on whether to visit a doctor.

The information is intentionally non-technical for accessibility.

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2. DOCTOR INTERFACE — SYSTEM WORKFLOW

3. OVERALL SYSTEM UNDERSTANDING