Abstract

The AI-Based Eye Hospital Chatbot is an intelligent virtual assistant designed to streamline patient care in ophthalmology clinics. By leveraging natural language processing (NLP), optical character recognition (OCR), and machine learning (ML), the chatbot automates initial symptom assessment, appointment scheduling, prescription analysis, and teleconsultation bookings. It reduces administrative workload, minimizes patient wait times, and ensures urgent cases are prioritized. Integrated with hospital databases, the chatbot maintains digital health records, improving continuity of care. This solution enhances efficiency, accessibility, and accuracy in eye care delivery while maintaining compliance with healthcare data regulations like HIPAA/GDPR.

How the Chatbot Works

The chatbot interacts with patients via text or voice on platforms like websites, mobile apps, or WhatsApp. Using AI-driven decision trees, it asks structured questions about symptoms, analyzes responses against medical knowledge bases, and classifies urgency (e.g., "urgent," "routine"). For critical cases, it fast-tracks appointments, while stable cases are guided to self-care or scheduled visits. The system integrates with electronic medical records (EMR), scans prescriptions for drug interactions, and schedules video consultations—all while maintaining secure, encrypted patient data.

Detailed Module Breakdown

1. AI Symptom Triage & Initial Assessment

Function:

Uses NLP (e.g., BERT/LLMs) to interpret patient-reported symptoms (e.g., "blurred vision," "eye pain").

Cross-references symptoms with ophthalmology databases to suggest conditions (e.g., glaucoma, cataracts).

Output:

Urgency classification (e.g., "See a doctor within 24 hours" or "Routine check-up").

2. Smart Appointment Scheduling

Function:

Syncs with hospital calendars to show real-time doctor availability.

Prioritizes slots based on symptom urgency (e.g., urgent cases get same-day appointments).

Output:

Automated confirmations and reminders (SMS/email).

3. Prescription Analysis (OCR + Drug Interaction Checker)

Function:

Scans uploaded prescription images using OCR (e.g., Tesseract).

Extracts drug names, dosages, and checks for interactions

Suggest the timeframes for eye drops and also provides suggestions to take medicines if they are prone to some allergies

Output:

Alerts for dangerous combinations or suggests generic alternatives.

4. Teleconsultation Booking

Function:

Integrates with video platforms (e.g., Zoom, custom telehealth tools).

Assigns doctors based on specialization (e.g., retina specialist vs. general ophthalmologist).

Output:

Secure video call links sent to patients.

5. Patient Records Management

Function:

Stores consultation history, prescriptions, and test reports in a HIPAA-compliant database.

Allows doctors to access records during visits.

Output:

Unified patient profile for continuity of care.

6. AI-Based Follow-Ups & Reminders

Function:

Sends post-visit surveys and medication reminders (e.g., "Use eye drops 2x daily").

Flags missed appointments for rescheduling.