Safe-Scroll

Hands-Free Help for Battlefield Surgeons

PRESENTED BY

Sara and Aayush

The Challenge in Battlefield Surgery

PATIENT INFLUX

Battlefield surgeons often face an **overwhelming number** of patients, leading to chaotic environments where quick decisions and triage are essential for life–saving care.

MAINTAINING STERILITY

Surgeons must keep their hands clean during procedures, making it **challenging to access** vital patient information quickly while upholding strict sterility standards.

TIME EFFICIENCY

Every second counts, and surgeons are treating patients whose medical history they don't now. So, getting patient info ASAP maximizes patient outcomes.

Introducing Safe-Scroll

HANDS–FREE INTERFACE

Safe–Scroll offers a **hand gesture** interface, allowing surgeons to operate without needing to touch their devices. They can:

- **Browse** patient files and MRI volumes using hand gestures (webcam)
- **Summarise** files with AI — key findings, abnormal vitals, core metrics
- **Listen** to summaries read aloud (closed fist = play audio)
- **Ask** questions by voice — hold L–shape to record, get answers from Gemini about the current patient

With **AI-generated audio summaries** and a **voice** assistant, Safe–Scroll enables surgeons to receive **instant patient information**, enabling them to make informed decisions in high–pressure situations.

Safe-Scroll
Touchless Patient Hub

Uses camera and mic. Speakers for audio.

← → files
☝ 1 finger = scroll up
✌ 2 fingers = scroll down
🤟 3 fingers = confirm patient (2s cooldown)

While scrolling patients, gestures are faster than swiping. If you want to pause patient scrolling, use this symbol to confirm.

✋ open palm = stop
✊ closed fist = play audio
🤙 hold L-shape 1s = rec
👍 ... = sen...

Stop camera

👋 Hand detected

Focus: 100%

Engagement: 100%

Patient Files

Peri-Operative Record - Chris Yip

PERI-OPERATIVE RECORD - Page 1 of 3

Patient: Chris Yip | MR#: MR923104
Date: 2026-02-14 | Suite #: 7

TIMING:
Patient in Room: 09:00
Anesthesia Start: 09:15
Time Out: 09:25
Procedure Start: 09:40

WOUND CLASS: 2 (clean / contaminated)
ANESTHESIA: Spinal
LEVEL OF CONSCIOUSNESS: Oriented
EMOTIONAL STATUS: Cooperative

ALLERGIES: Latex
NPO AFTER MIDNIGHT: Yes
SKIN CONDITION: Warm, Pink

PRE-OPERATIVE DIAGNOSIS:
Knee arthroplasty

OPERATIVE PROCEDURES:

Patient Summary
Chris Yip

- **Pre-operative diagnosis**: **Knee arthroplasty**.
- **Planned procedure**: **Total knee arthroplasty**.
- **Allergy**: **Latex**.
- Patient is **oriented** and **cooperative** under **Spinal anesthesia**.

Abnormal vitals:
- No **abnormal vitals** or **lab values** reported.

Core metrics:
HeartRate
N/A
BloodPressure
N/A

Chris Yip is scheduled for a **Total knee arthroplasty**. The patient has a **Latex** allergy and will be receiving **Spinal anesthesia**. Pre-operatively, patient is **oriented** and **cooperative**.

Patient data
3 fingers = switch (cooldown)

Care

"Safe-Scroll empowers surgeons to care deeply"

— SAFE–SCROLL TEAM

What Safe-Scroll can do

Gemini

Patient summarization (JSON) + voice QA answers

IIElevenLabs

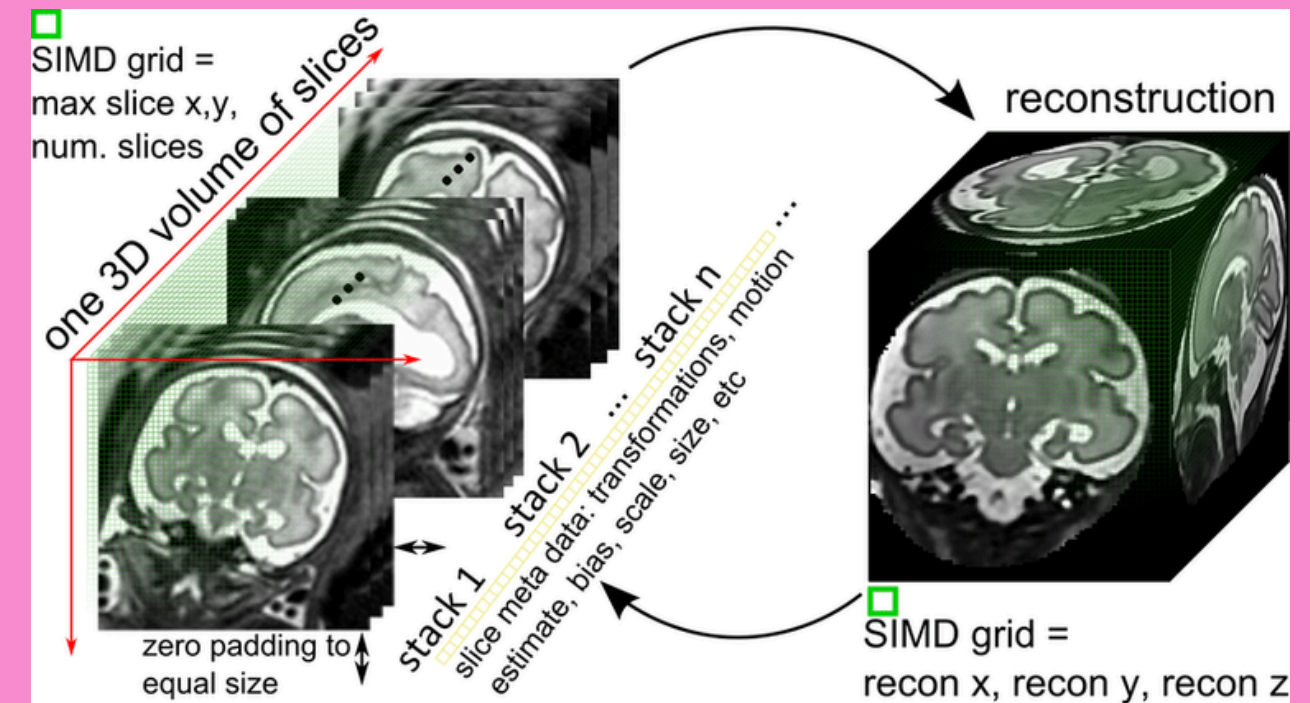*TTS for summaries, STT for voice questions*

mongoDB

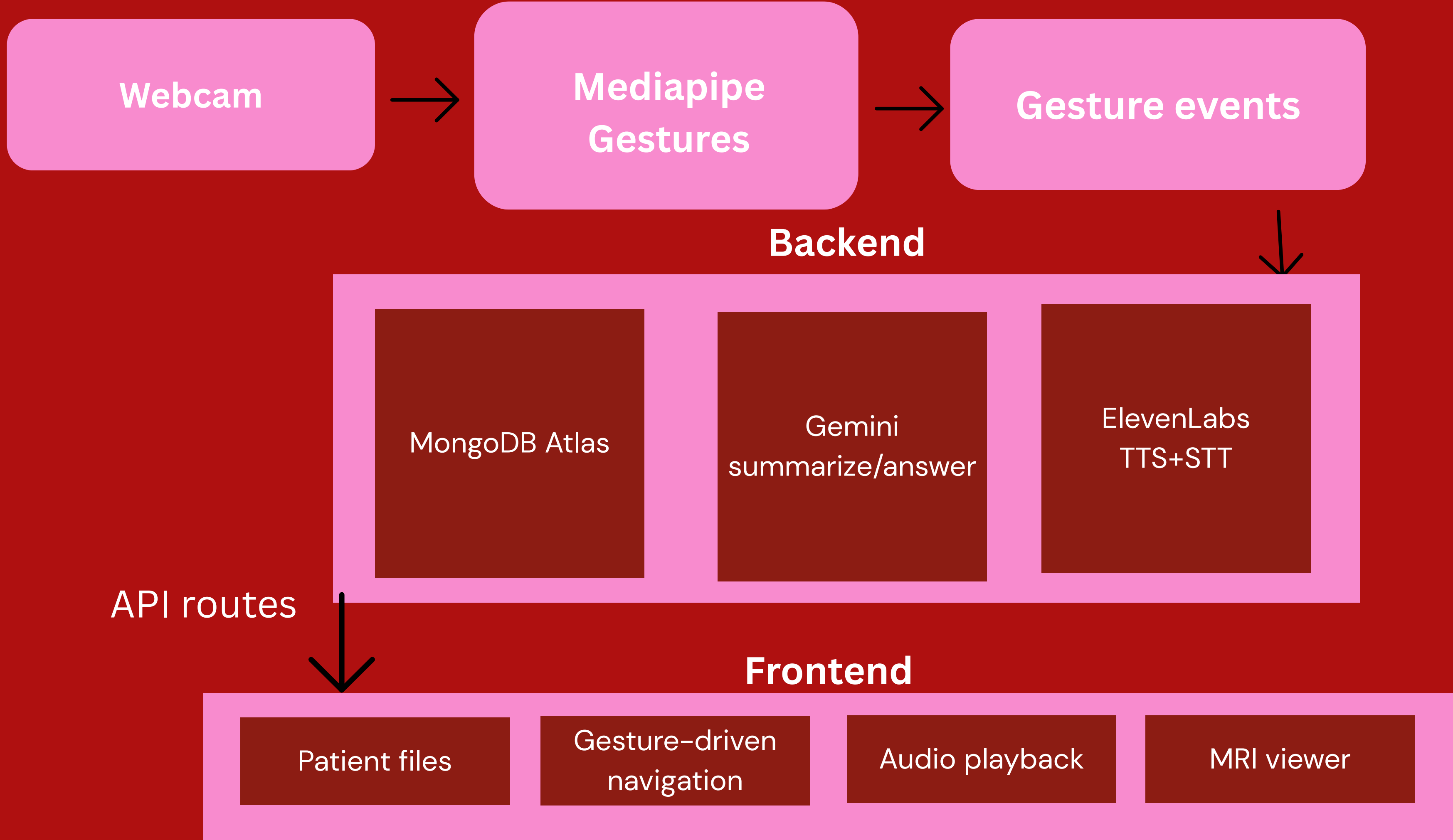*Patient medical records and imaging storage*

MediaPipe

Vision and movement detection

MEDICAL IMAGING

` *Surgeons can go through 2D slices of 3D MRIs/CTs with high precision using high precision scrolling interface to find the right image in hundreds.*

Webcam → Mediapipe Gestures → Gesture events

Backend

MongoDB Atlas | Gemini summarize/answer | ElevenLabs TTS+STT

API routes

Frontend

Patient files | Gesture-driven navigation | Audio playback | MRI viewer

Next Steps

PROTOTYPE TESTING

We will conduct thorough **prototype testing** in realistic medical scenarios to refine user experience and ensure Safe–Scroll meets the needs of battlefield surgeons effectively.

PARTNERSHIPS

We are seeking collaborations with medical and military organizations to enhance Safe–Scroll's capabilities and further its development for real-world applications in crisis situations.