MedEdge

Local Privacy-First Distributed Patient Monitoring System 🏥

"AI agents that watch vitals without compromising privacy."

Who are we?

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Problem & Who's Affected

Problem: ICUs require constant visual & vital monitoring, but regulations like HIPAA/GDPR prohibit sending raw patient data to the cloud.

Who's Affected:

- Nurses → Need quick, hands-free insights
- Doctors → Require timely anomaly alerts
- Hospitals → Must ensure HIPAA-compliant patient monitoring

Current Gap: ECG data exists but is locked inside machines; manual interpretation and delayed escalation increase risks. Cameras are installed in rooms but data is private which can be deployed on cloud

Our Insight (Why Now / Why Us)

Why Now:

- Rising ICU admissions and patient monitoring needs
- Growing data privacy regulations globally (HIPAA, GDPR)
- Edge AI and lightweight LLMs make on-device inference practical today
- Current AI assistants are cloud-based, unsuitable for sensitive patient data.

Why Us:

- We're combining distributed agentic frameworks + local LLMs to provide secure, offline intelligence.
- Expertise in distributed AI agents for real-time and edge systems
- Unique architecture enabling zero-data-leakage patient care

Solution Demo (Screens/UI/Flow)

Scenario:

- Nurse says: "What's the patient's heart rhythm today?"
- Nurse Owned Agent requests Camera Feed from Hospital Agent via protocol communication over internet
- Insights returned:
- Normal sinus rhythm ✅
- Adds findings to patient's daily monitoring chart automatically.
- If anomaly detected → Distributed Agent sends alert to the concerned doctor instantly.

Key Components: Multimodal Input, ECG (with local LLM) and Edge AI, Distributed communication protocol for agent collaboration
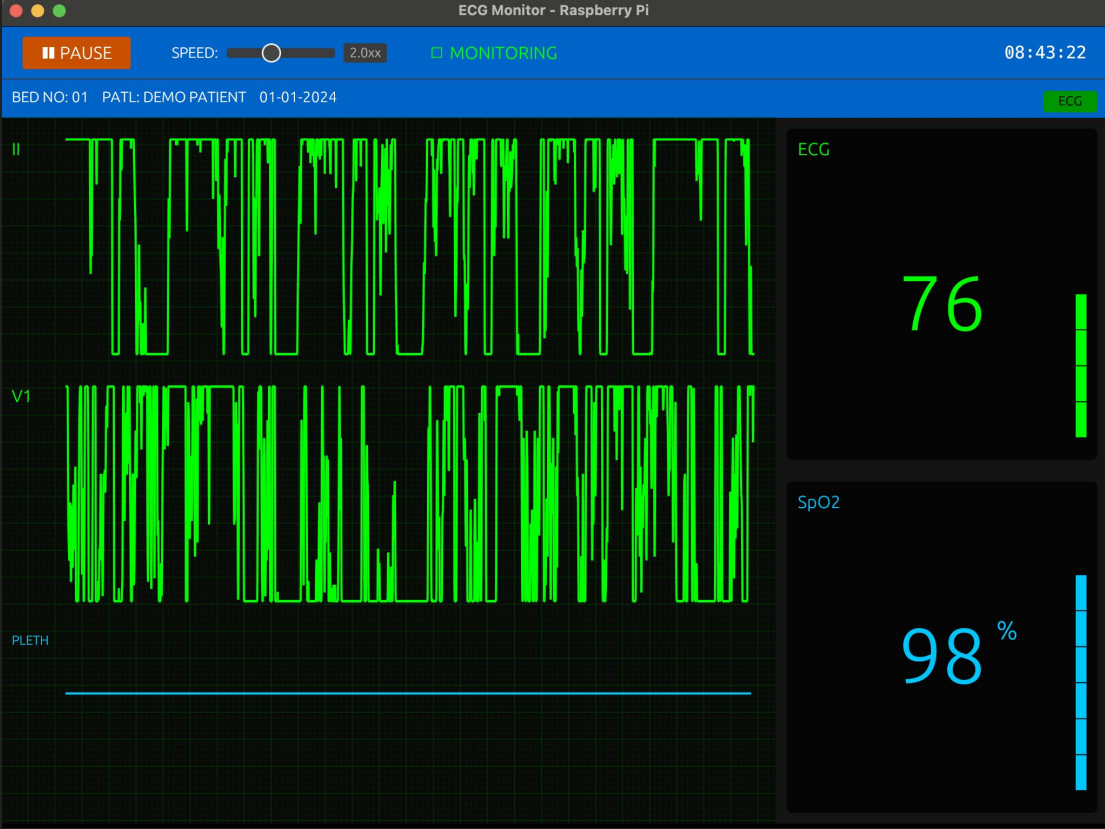
Tech Approach (Models, Data, Architecture)

Models: OpenAI and Experiments with TinyLLama 1.1B

Data: Local ECG machine data (raw waveform + readings)

No cloud storage — data stays on device

Architecture: Distributed AI Agent Framework

ECG Machine: Edge AI deployment on ECG

Doctor Notification Agent: Sends insights securely within the hospital network

Privacy Layer: Can be completely local when privacy is needed or can be be hybrid if intelligence is at most, Flexible enough to handle anything.

Value & GTM (Go-To-Market)

Who Pays: Hospitals, ICUs, elderly care homes, health-tech providers

Value to Customers:

- Faster emergency detection → reduced patient risk
- Cost savings via cloud-free infrastructure
- Enhanced compliance and reduced liability risks

Go-to-Market Strategy:

- Initial pilots in partner hospitals
- Subscription model for distributed monitoring agents
- Integration with ECG device manufacturers and hospital EMR systems

Next Steps (Roadmap & Risks)

Roadmap:

- MVP (1 month): Complete the AI Distributed Framework to support A2A protocol
- Pilot (3 months): Deploy in a small hospital ward/ICU cluster (5–10 beds)
- Scale (6 months): Extend to multiple departments & integrate with EMR. Integrate with full HIS & alert systems

Risks:

- Model hallucinations → Rule-based guardrails & doctor confirmations
- Data privacy breaches → Edge-only inference + encrypted storage
- Regulatory hurdles → Built-in HIPAA/GDPR compliance