PulsEye
BY XZENT SOLUTIONS

The room is the monitor. Nothing to wear. Nothing to charge.

PulsEye senses heart rate through ordinary Wi-Fi signals — continuously, contactlessly, and without cameras. Ambient wellness monitoring for elderly care, built to disappear into the background.

TRL 6 working prototype | Patent filed **202521106451** | **DPIIT**-recognized startup | IIT Bhubaneswar Health Hackathon **Winner**

01 · VISION

"Make contactless physiological monitoring as commonplace as Wi-Fi itself."

02 · THE PROBLEM

Between two nurse rounds, anything can happen.

Elderly care homes and home-healthcare providers still depend on periodic manual checks or wearable devices. Both fail exactly where it matters.

Blind spots for hours

Manual rounds happen every few hours. Physiological deterioration in the gaps goes unnoticed until the next check — often too late for early intervention.

Wearables get taken off

Elderly residents forget to charge them, find them uncomfortable, or simply remove them. Compliance collapses — and with it, the data.

Cameras cross the line

Video monitoring is unacceptable in bedrooms and care settings. Privacy concerns rule out the one technology that could watch continuously.

347M

Indians aged 60+ by 2050 — up from 149M today

UNFPA India Ageing Report 2023

2.1B

people aged 60+ worldwide by 2050

World Health Organization

10M

projected global shortfall of health workers by 2030

World Health Organization

03 · THE SOLUTION

Monitoring that asks nothing of the person being monitored.

PulsEye is an ambient physiological sensing platform. Two palm-sized nodes turn any room into a continuous heart-rate monitor — using nothing but Wi-Fi signals.

- ✓ **Contactless heart-rate monitoring** — no device on the body, ever.
- ✓ **Continuous by default** — day and night, awake or asleep.
- ✓ **Real-time alerts** when readings drift outside safe ranges.
- ✓ **Sleep and long-term trend analysis** for early pattern detection.
- ✓ **Caregiver dashboard** for whole-facility visibility.

The PulsEye kit: compact transmitter and receiver nodes with live BPM display.

04 · THE TECHNOLOGY

Wi-Fi Channel State Information.

Every Wi-Fi transmission carries fine-grained data about how the signal traveled — how it reflected, scattered, and shifted on the way. When a heart beats, the chest moves fractions of a millimetre, and those micro-motions leave a measurable imprint on the channel. PulsEye reads that imprint.

Radio, not optics

Wi-Fi CSI works through blankets, clothing and darkness. No line of sight, no lens, no image of anyone — physically incapable of capturing a picture.

Signal processing + AI

Adaptive filtering and machine-learning models separate the cardiac signature from ambient motion — fans, curtains, people walking and talking.

Edge computing

Processing runs at the edge on commodity radio hardware. Raw signal data stays local; only heart-rate readings, trends and alerts leave the room.

Core stack: Wi-Fi CSI · embedded systems · signal processing · AI · edge computing

05 · SYSTEM ARCHITECTURE

From radio waves to a caregiver's phone.

TRANSMIT
TX Node
ESP32-C3 fills the room with standard Wi-Fi signals

→

SENSE
2× RX Nodes
ESP32-S3 receivers capture channel state information

→

EXTRACT
Edge Processing
Filtering + AI isolate heart rate from ambient noise

→

ACT
Cloud Platform
Dashboard, alerts, sleep & long-term trend analytics

One transmitter + two receivers per room · installs in minutes · no resident interaction required

06 · THE HARDWARE

Deliberately simple hardware.

PulsEye runs on commodity ESP32-class radios — the same chips inside millions of smart-home devices. That is a strategic choice, not a compromise.

Inside PulsEye: display, sensing radio, battery and enclosure — engineered for low cost at scale.

- **Low unit cost** keeps per-room economics attractive at fleet scale.
- **Proven supply chain** — no exotic radar silicon, no custom RF front-ends.
- **The moat is the software:** patented sensing method, signal-processing pipeline and AI models ride on inexpensive hardware.
- **Field-updatable:** new capabilities ship over the air to hardware already on walls.

07 · THE PRODUCT TODAY

Working now, at TRL 6.

PulsEye is a functioning system validated in relevant environments — not a concept render.

Contactless heart rate

Continuous BPM readings extracted from Wi-Fi channel state — no contact, no wearable.

Alerts

Configurable notifications when heart-rate readings move outside expected ranges.

Sleep trends

Night-time analysis of resting heart-rate patterns — when residents are most at risk and least observed.

Long-term trends

Weeks and months of heart-rate history reveal slow drifts that single readings never show.

Dashboard

Facility-wide view for caregivers and administrators: every monitored room, at a glance.

24 / 7 by design

Ambient sensing never needs charging, never gets taken off, never looks away.

08 · ROBUSTNESS

Built for real rooms, not lab conditions.

Real care environments are full of motion and interference. PulsEye keeps reading heart rate despite:

People walking

Motion-tolerant processing separates gait energy from cardiac micro-motion.

Conversation

Talking and vocal vibration are filtered out of the sensing band.

Ceiling & table fans

Periodic mechanical interference is identified and cancelled.

Curtains moving

Slow, large-surface drift is rejected by adaptive filtering.

Furniture movement

Transient environmental changes do not corrupt trend data.

Best when it matters

Peak accuracy while resting, sitting and sleeping — precisely the hours when no one else is watching. Current systems are optimized for single-occupant rooms.

09 · DEPLOYMENT

Install in minutes. Monitor for years.

- ✓ **1 — Mount.** Place one transmitter and two receivers in the room. No wiring beyond a power socket, no construction, no calibration ritual.
- ✓ **2 — Connect.** Nodes join the facility network and register to the PulsEye cloud automatically.
- ✓ **3 — Monitor.** Heart-rate data, alerts and trends start flowing to the dashboard. Residents change nothing about how they live.

Designed for B2B fleets: a single elderly-care customer deploys across dozens to hundreds of rooms under one dashboard.

TX and RX nodes pair wirelessly — the room becomes the sensor.

10 · CUSTOMER VALIDATION

We built the roadmap inside care homes, not a boardroom.

Field discovery across multiple elderly care homes in Pune shaped what we build next.
What operators told us:

What they asked for

- ✓ **Bed-exit alerts** — the single most requested capability.
- ✓ **Alerts where staff already are:** the nursing station and WhatsApp.
- ✓ **More vitals over time:** blood pressure, SpO_2, respiration, temperature, sugar.

What we learned

- ✓ **Alerts beat dashboards.** Operators want the system to interrupt them at the right moment, not another screen to watch.
- ✓ **Heart rate is the entry point,** not the destination — the platform vision is multi-vital ambient sensing.
- ✓ **Every finding maps to our roadmap** — bed-exit and alert routing are next to ship.

11 · ROADMAP

One install. A compounding platform.

Every new capability ships as software to hardware already deployed — expanding revenue per room without another site visit.

NOW · SHIPPING

- Contactless heart-rate monitoring
- Continuous 24/7 sensing
- Threshold alerts
- Sleep & long-term trends
- Caregiver dashboard

NEXT · IN DEVELOPMENT

- Bed-exit detection
- Nursing-station alerting
- WhatsApp alerts for staff & family

FUTURE · PLATFORM

- AI-assisted ambient physiological sensing
- Multi-vital expansion guided by customer demand
- Multi-occupant room support

12 · MARKET & GO-TO-MARKET

Start where aging is fastest. Scale where care is priciest.

India

Beachhead: elderly care homes & home-healthcare agencies. 60+ population growing from 149M to 347M by 2050; organized senior living expanding rapidly.

US & UK

Follow-on: ~30,000 US assisted-living communities and ~17,000 UK care homes, under chronic staffing pressure and rising monitoring budgets.

$100B+

Remote & ambient patient monitoring projected to exceed US$100B globally by the early 2030s.

Industry estimates

Motion

Founder-led enterprise sales. Land with a paid pilot in a handful of rooms; prove alert value to operations staff; expand across the facility and then across the chain. B2B focus means one customer relationship covers dozens to hundreds of rooms.

Sequence

Pune first — dense senior-living market and home-turf networks. Then Mumbai, then other Indian metros. International expansion into US/UK senior living follows with partners, once fleet operations are proven at home.

CAPABILITY	PULSEYE	WEARABLES	CAMERAS	PRESSURE MATS
No user compliance needed	Yes	No	Yes	Yes
Privacy-preserving	Yes	Yes	No	Yes
Continuous heart-rate data	Yes	If worn	No	No
Whole-room coverage	Yes	No	Yes	Bed only
Nothing to charge or maintain daily	Yes	No	Yes	Yes
Commodity hardware cost	Yes	Varies	Varies	Varies

13 · BUSINESS MODEL

Hardware opens the door. Software compounds.

Per-room hardware kit

One-time sale of the three-node sensing kit for each monitored room.

Recurring SaaS

Monthly subscription per monitored room: monitoring, alerts, trends and dashboard — predictable, expandable revenue.

Expansion built in

Bed-exit, alert routing and future vitals ship as software upgrades to the installed base — raising revenue per room over time.

Customers: elderly care chains · assisted living operators · home-healthcare providers

14 · TRACTION, PATENT & STORY

Two years of building. One disciplined pivot.

TRL 6

System prototype demonstrated in relevant environment

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Patent filed: "A Contactless Vital Sign Monitoring System and a Method Thereof" · App. No. 202521106451

IIT Bhubaneswar Health Hackathon Winner · Incubated at GH Raisoni TBI · DPIIT-recognized

AUG 2023

XZent Solutions founded

First product: WeaveGuard, AI-powered textile inspection.

2024–2025

Validated — then killed — WeaveGuard

Customers confirmed the tech worked, but low labour costs undercut the ROI. We made the hard call early rather than scaling a weak business. That discipline is the point.

OCT 2025

Pivoted to PulsEye

Redirected our embedded, AI and signal-processing depth at a problem with structural tailwinds: ambient monitoring for a rapidly aging world.

NOV 2025

Patent filed

Contactless vital-sign monitoring system and method, filed with the Indian Patent Office.

DEC 2025

Incubated at GH Raisoni TBI

Prototype advanced to TRL 6; customer discovery underway across Pune care homes.

15 · TEAM

Engineers who have shipped hardware together before.

All four are engineering batchmates from SSGMCE Shegaon — a founding team with existing trust, complementary depth, and a prior venture behind them.

SC — **Saurav Chaudhari**
CO-FOUNDER & CEO

Electronics engineer. Ex-CTO of HTNP Industries (defence-tech). Published researcher in Wi-Fi CSI-based cardiorespiratory sensing — Kalman filtering, HRV extraction, federated learning. Leads product and enterprise sales.

KP — **Ketan Pise**
CO-FOUNDER & CTO

Software engineer at Mercedes-Benz R&D India; previously LTIMindtree. Full-stack systems, AI/ML, IoT and cloud. Owns the PulsEye platform: edge pipeline to dashboard.

SG — **Shantanu Gawande**
BUSINESS STRATEGY

Consultant at Deloitte; three years in digital transformation at TCS; DRDO trainee. Co-founded and led HTNP Industries, raising funds and building its R&D roadmap.

DF — **Dinesh Fukate**
EMBEDDED SYSTEMS

Embedded engineer at Bosch Global Software Technologies. Automotive-grade firmware, systems validation and high-performance embedded compute — rigor PulsEye's hardware inherits.

16 · PARTNER WITH US

The next decade of care will be ambient.

We are raising our seed round to move from validated prototype to paying fleet deployments across Pune and Mumbai — and we're looking for investors and pilot partners who see what we see.

Get in touch

PulsEye is an ambient wellness monitoring platform. It is not a medical device and is not intended to diagnose, treat, cure, or prevent any disease. Market figures are drawn from public sources (WHO, UNFPA, national care registers) and industry estimates, provided for context only.

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