Omdena

Projects / AI Innovation Project

# Building VisionVitals: AI-Powered Biometric and Vital Signs Monitoring Through Camera

Project Kickoff: May 12, 2025

AI-Powered Biometric and Vital Signs Monitoring Through Camera, enhancing healthcare accessibility and improving diagnostic accuracy in rural and semi-urban areas. In this 8-week challenge, you will join a collaborative team of 50 AI engineers from all around the world.

**The problem**

Access to essential healthcare diagnostics is severely limited for individuals in rural and semi-urban areas, primarily due to the high costs associated with medical diagnostic equipment and the need for specialized technology. The majority of current diagnostic tools require substantial infrastructure and technical expertise, making them inaccessible to large segments of the global population. This lack of access is particularly acute in less developed regions, where healthcare facilities may be under-resourced and unable to afford advanced diagnostic technologies.

### Impact of the Problem:

- **Healthcare Disparities:** The inability to access basic diagnostic services exacerbates health disparities between urban and rural populations. People in remote areas often receive lower standards of healthcare, if they receive any at all, leading to worse health outcomes compared to their urban counterparts.
- **Delayed Interventions:** The absence of timely and accurate diagnostics means that many medical conditions go undetected until they become severe, complicating treatment and reducing the chances of recovery. Early detection of health issues, which is crucial for effective intervention, is thus not possible in these settings.
- **Increased Healthcare Costs:** When diseases are not diagnosed early due to the unavailability of diagnostic tools, the eventual treatment becomes more complex and costly. This not only strains the financial resources of individuals and families but also puts additional pressure on the healthcare systems of these regions.
- **Economic Impact:** Poor health significantly hampers productivity. Communities with inadequate access to healthcare diagnostics suffer from reduced workforce efficiency, which can stifle economic development and perpetuate cycles of poverty.
- **Public Health Risks:** The lack of widespread diagnostic capabilities can lead to undetected and uncontrolled outbreaks of infectious diseases. This is particularly dangerous in densely populated rural areas, where contagious diseases can spread rapidly without detection and timely intervention.

This project aims to bridge the diagnostic divide by leveraging artificial intelligence to develop affordable, camera-based solutions for monitoring vital signs. By utilizing common technology such as smartphones and digital cameras, the project will enable non-invasive, low-cost health monitoring accessible to populations in rural and semi-urban areas. This innovative approach seeks to democratize health diagnostics, ensuring that timely healthcare interventions are possible and improving overall public health outcomes. The use of AI in this context promises not only to enhance the availability of health services but also to revolutionize the way healthcare is delivered in under-resourced settings, ultimately leading to better health equity and improved lives.

## The goals

transform the AI-driven camera-based vital sign monitoring system from a validated concept into a market-ready product with a compelling demo application. This phase will focus on product refinement, clinical validation, user experience optimization, and creating the necessary infrastructure for deployment.



**Product Architecture & UX Development**

- Design a scalable cloud architecture for the AI monitoring system

- Develop an intuitive user interface for healthcare professionals and patients
- Create visualization dashboards for real-time vital sign monitoring and historical data analysis
- Establish security protocols for HIPAA compliance and patient data protection

**Demo Application Development**

- Build a fully functional demo application showcasing core capabilities
- Implement real-time vital sign detection using standard webcams/smartphone cameras
- Create comparison visualizations against traditional vital sign measurement methods
- Develop API documentation for potential integration with existing healthcare systems

**Clinical Validation & Certification Planning**

- Conduct small-scale clinical trials with healthcare partners
- Collect comparative data against gold-standard medical devices
- Document accuracy metrics across diverse patient demographics
- Prepare regulatory pathway documentation for FDA/CE certification

**Market Positioning**

- Create professional marketing materials including website, case studies, and demo videos
- Develop pricing models for different market segments (hospitals, clinics, telehealth)
- Design implementation roadmap templates for different healthcare settings

**Deployment Infrastructure & Support Systems**

- Establish cloud infrastructure for secure data processing and storage
- Create automated deployment pipelines for continuous integration/delivery
- Develop training materials for healthcare staff implementation
- Build customer success protocols and technical support framework

## Why join? The uniqueness of Omdena AI Innovation Challenges

A collaborative experience you never had in your working life! For the next eight weeks, you will build AI solutions to make a real-world impact and go through an entire data science project lifecycle. This covers problem scoping, data collection, and preparation, as well as modeling for deployment.

And the best part is that you will join a global and collaborative team of changemakers. Omdena AI Challenges are not a competition or hackathon but a real-world project that will take your experience of what is possible through collaboration to a new level.

Find more information on how an Omdena project works

Ready to enhance your operations with AI?

### First Omdena Project?

- Join the Omdena community to make a real-world impact and develop your career
- Build a global network and get mentoring support
- Earn money through paid gigs and access many more opportunities

## Your Benefits

- Address a significant real-world problem with your skills
- Get hired at top companies by building your Omdena project portfolio (via certificates, references, etc.)
- Access paid projects, speaking gigs, and writing opportunities

## Requirements

- Good English
- A very good grasp in computer science and/or mathematics
- (Senior) ML engineer, data engineer, or domain expert (no need for AI expertise)
- Understanding of Machine Learning, and/or Data Analysis

## This challenge is hosted by

Omdena

## Application Form

Complete your application today and join us on an exciting journey.

Click "Apply now" to get started!

Product Manager for Building VisionVitals: AI-Powered Biometric and Vital Signs Monitoring Through Camera — Application Closed.

Collaborator for Building VisionVitals: AI-Powered Biometric and Vital Signs Monitoring Through Camera — Application Closed.

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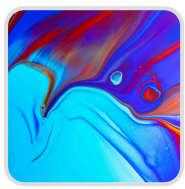

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