Group Number: T06

- App Name: RayVita
- Team Members:

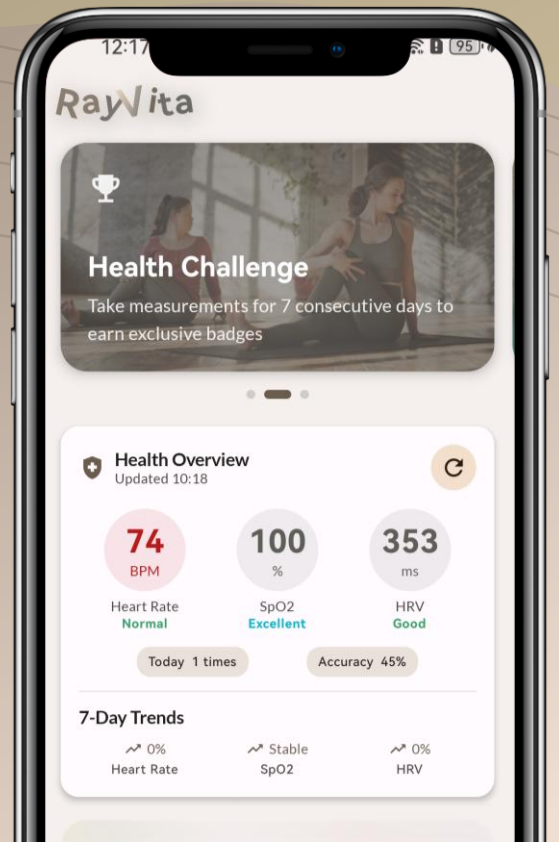
Ziheng Wang, Dongxu Xia, Di Wu, Renzhe Zhao

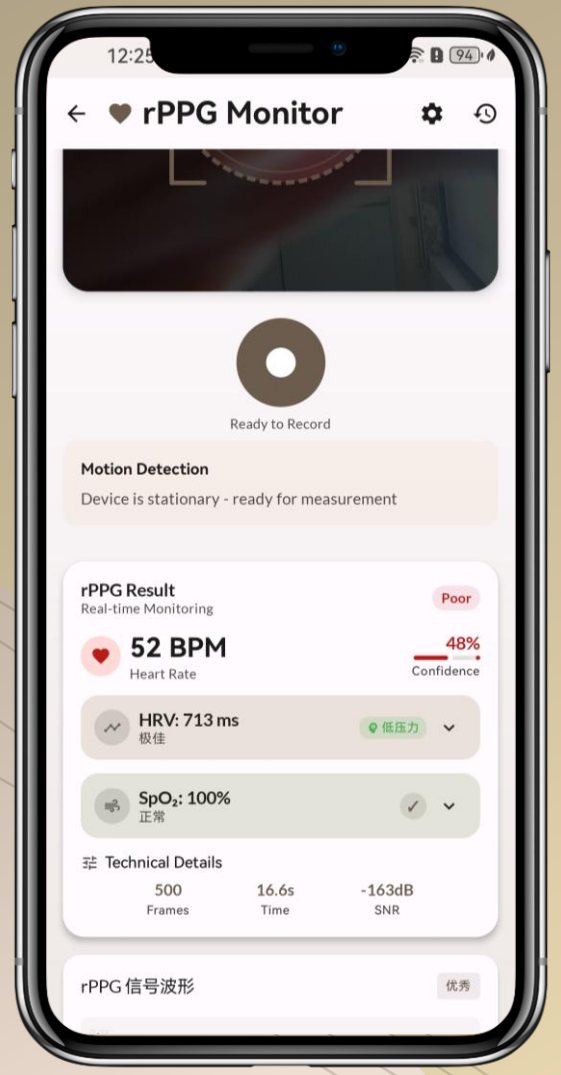
- Instructor: Associate Professor Weiwei Jiang

RayVita

Your rPPG Health Companion

Start Now





Welcome To RayVita Application

Introduction

RayVita is a smart health monitoring and lifestyle app powered by remote photoplethysmography (rPPG) technology. It provides non-contact physiological measurement, AI-driven insights, and personalized visual experiences.

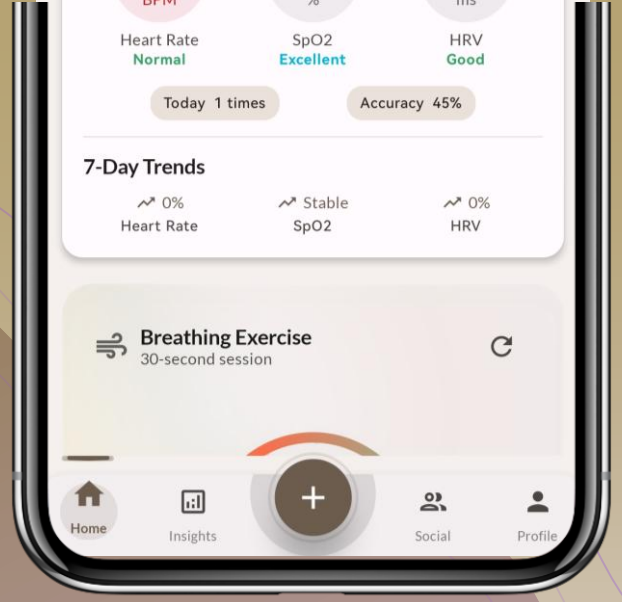
Purpose & Audience

01

People caring about health without wearable devices

02

Students, developers, and healthcare explorers



Motivation

03

Bringing rPPG to Daily Life

04

AI-powered Personalized Wellness

Novelty

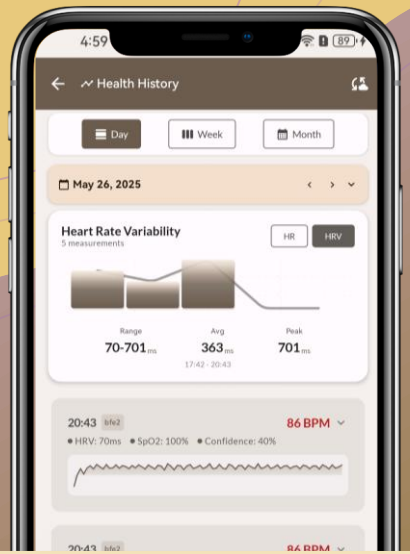
05

Seamless fusion of AI, health, and aesthetics

06

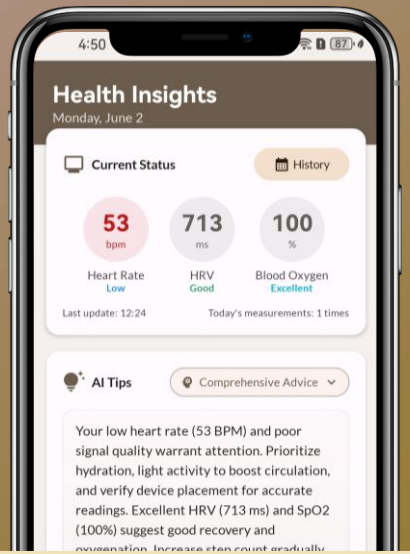
AI-generated personalized theme

Types Of Features In Apps



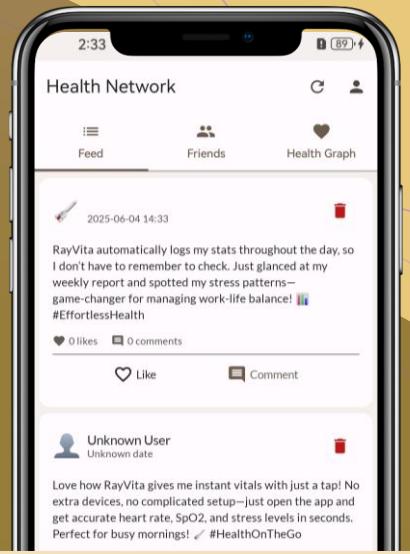
Feature 01

rPPG-based heart rate & HRV



Feature 02

Daily AI health tips



Feature 03

Social System

Home Page

Welcome to RayVita

All-in-One AI Health Companion

Quick access to health data

Breathing training,
daily tips
, achievements

Dynamic banners and
theme-based layout

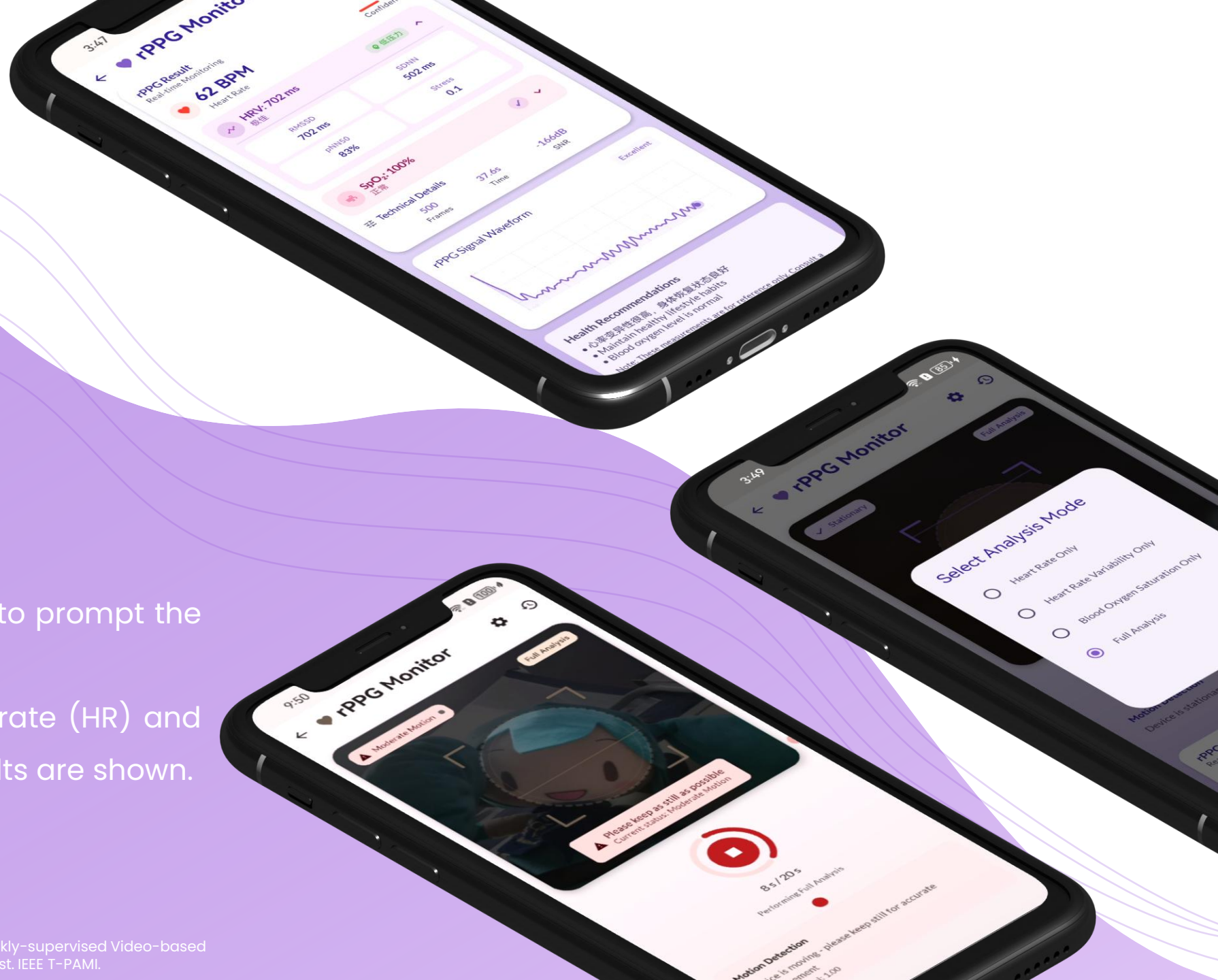
Contactless rPPG Scan

<5%[1]

MAR

Activates the accelerometer to prompt the user to remain still.

After model inference, heart rate (HR) and heart rate variability (HRV) results are shown.



Reference:
[1]Sun, Z., & Li, X. (2023). Contrast-Phys+: Unsupervised and Weakly-supervised Video-based Remote Physiological Measurement via Spatiotemporal Contrast. IEEE T-PAMI.

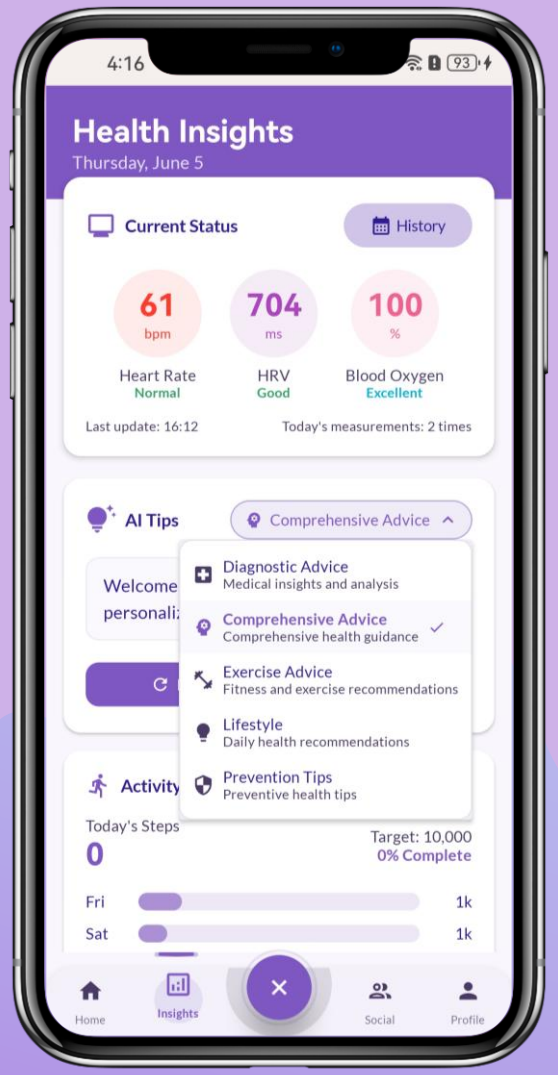
Health History Trends & Sync

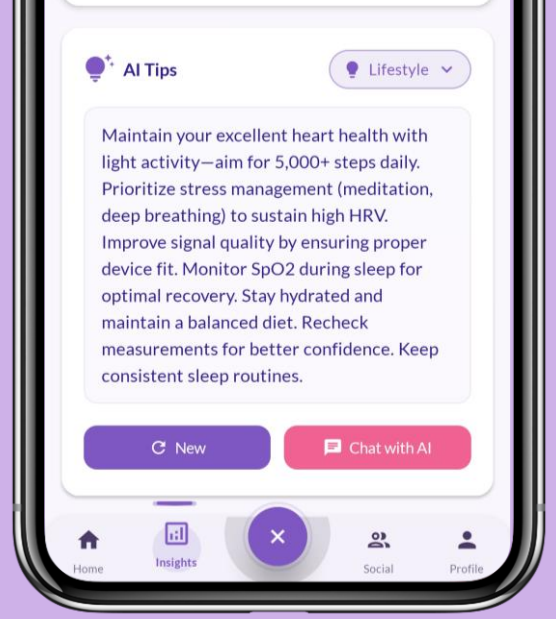
Your Data, Your Timeline

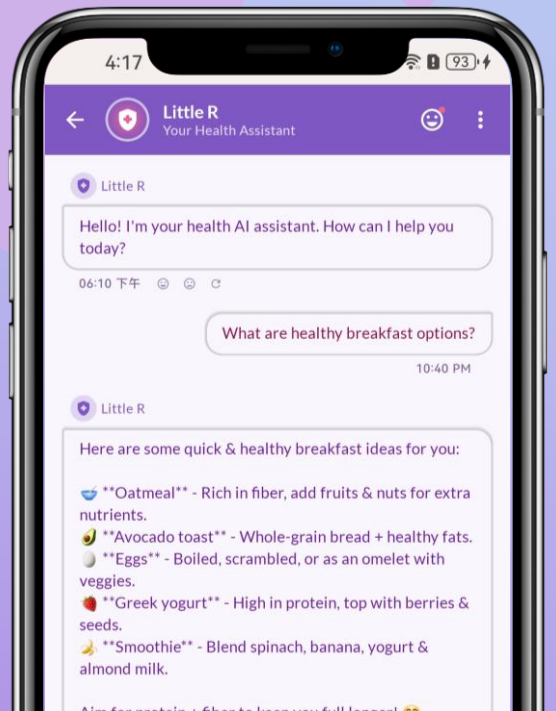
Visualize health changes over time with smooth charts

Cloud sync via secure token; all records stored locally by default

Responsive layout with weekly and monthly summaries and quick access







AI Health Assistant

Minimalist Guidance, Max Value

Daily tip card powered by health AI model

Focused and personalized for user habits

Chat and ask for help with our AI Agent little R

TTW

5+

Tips mode

Login RayVita Account

01

Account

RayVita implenment login and register with MySQL db in our cloud server

2025

10+ Users

2027

101+ Users ?

02

Perference

You can change language, theme , notification setting here

2026

100+ Users ?

2028

102+ Users ?

Need Multilingual Experience ?

RayVita enables seamless language switching for users, with English as the default option.

01

Currently, users can also select Simplified Chinese for a tailored experience.

02

Future updates will introduce additional languages to enhance global accessibility.

Currently, only Simplified Chinese and English are implemented. Other languages will be added in subsequent versions.

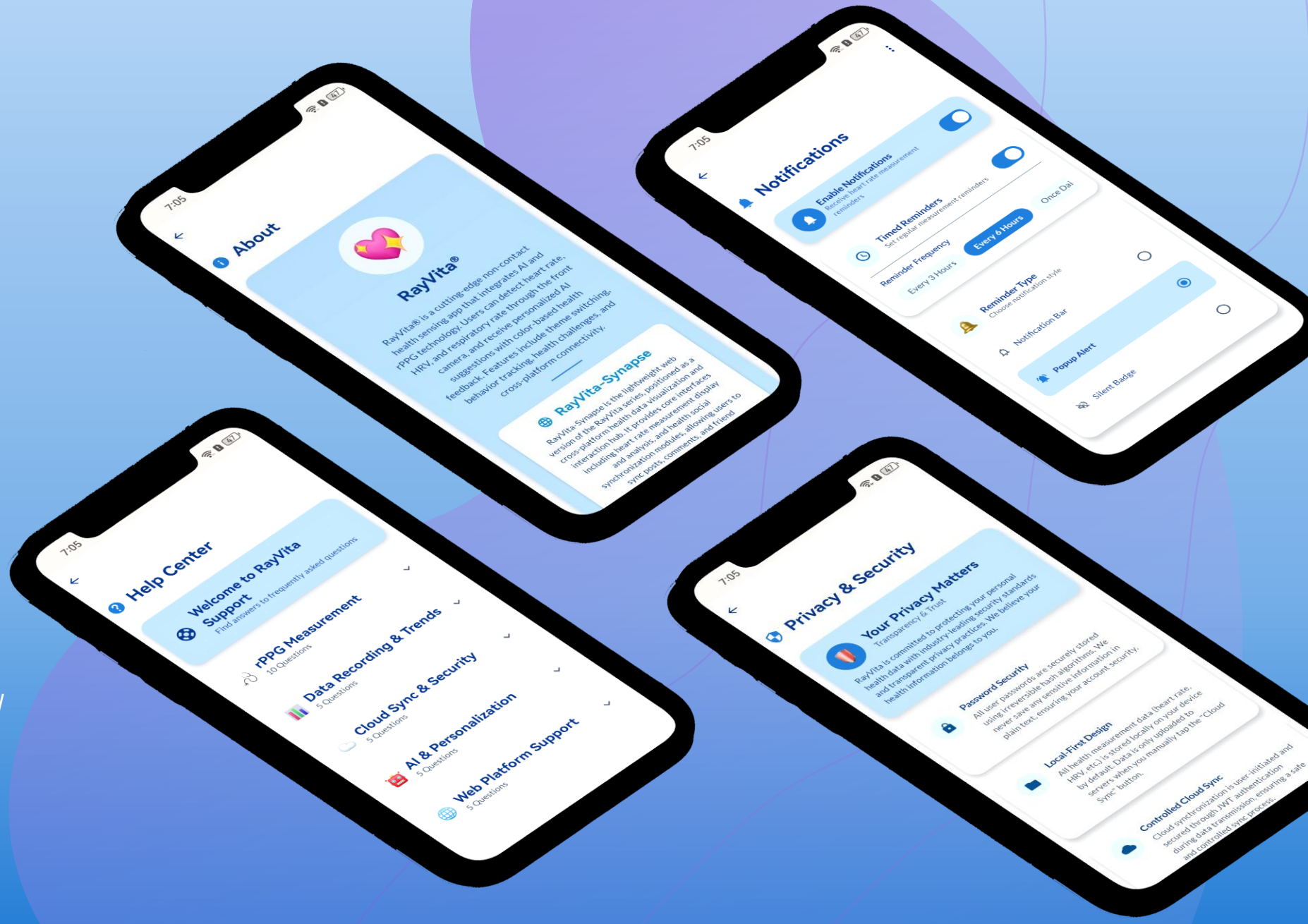
More Options

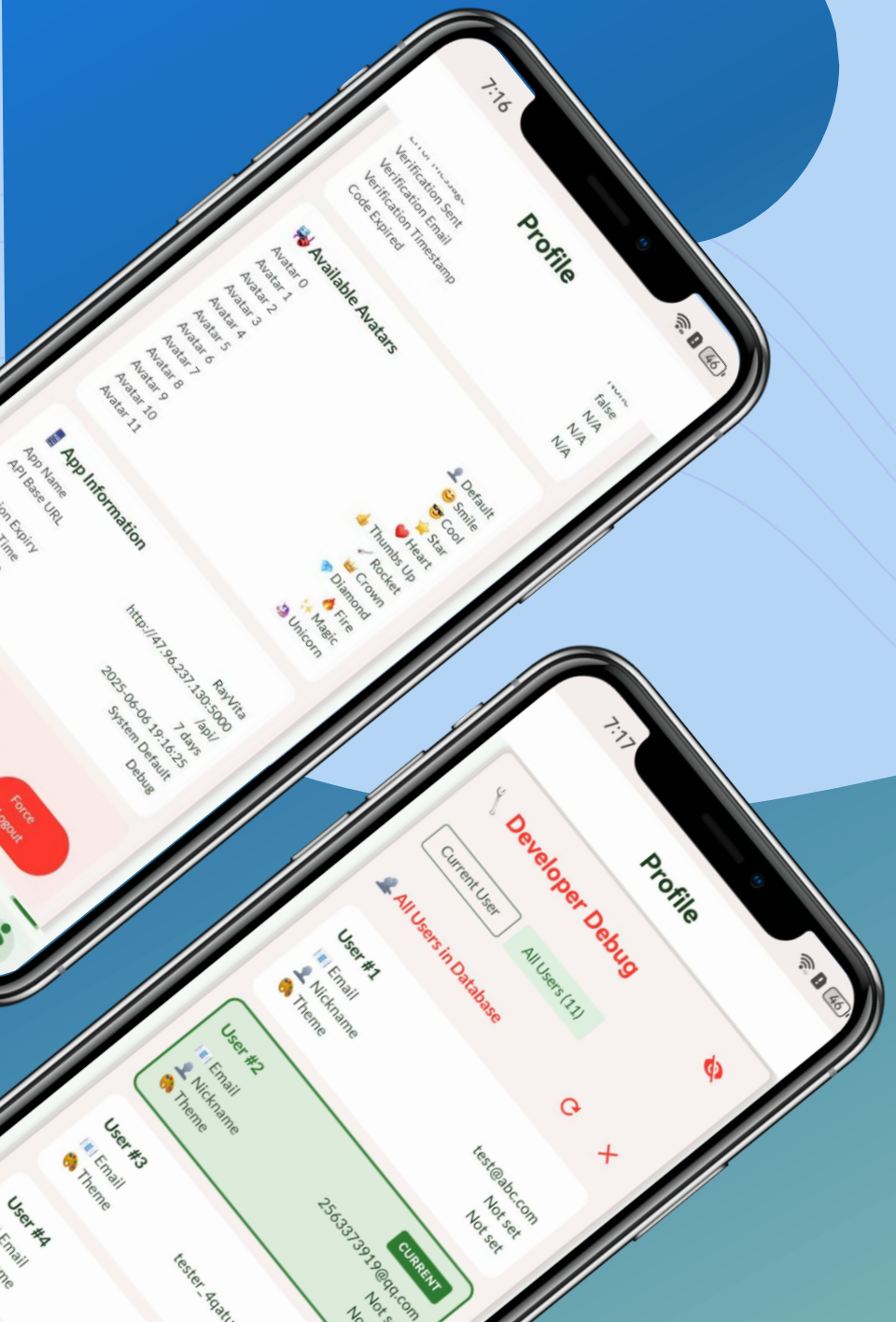
Informed & In Control

Notification frequency, auto measure toggle

About: Team, funding, thanks (w/ easter egg)

Help Center: 30+ FAQs on data, syncing, and privacy





Developer Playground

Test and Inspect Internally

01

Current Status

Know about current user status and cache, force logout fuction

02

Debug

Debug theme injection & component rendering

03

Future Extension

Offer more developer functions in the future

Custom Visual Themes

10+ Themes

RayVita offers over 10 built-in themes to suit all tastes, such as **Warm Earth**, **Forest Green**, **Ocean Blue**, **Violet Dream**, and tech-focused **Bio Serenity** and **Cardio Sync**. All theme designed based on Material Design principles. More series and themes will be added in future updates for greater personalization.

Create with Words

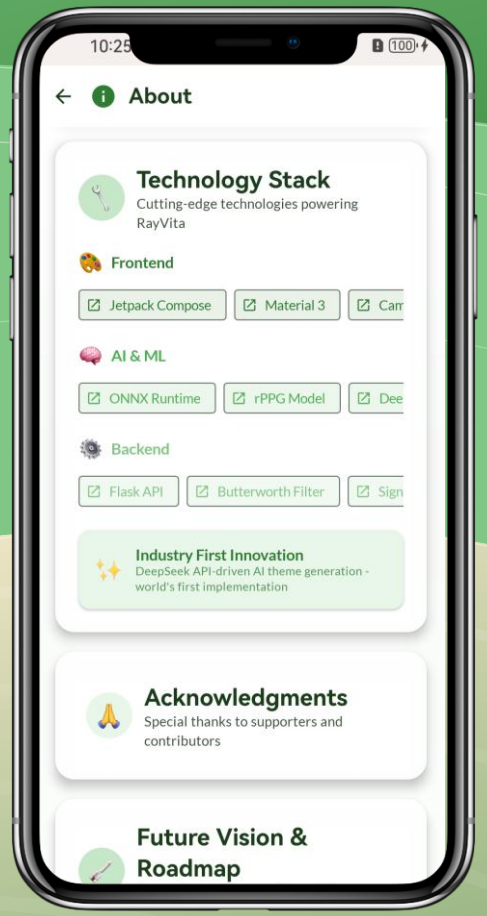
World first AI-Powered Aesthetic Personalization

Generating...

Users input a sentence or word (e.g., "gentle sunrise")

DeepSeek API returns a unique theme color set + meaning

Results cached locally for fast theme switching



Mobile Architecture

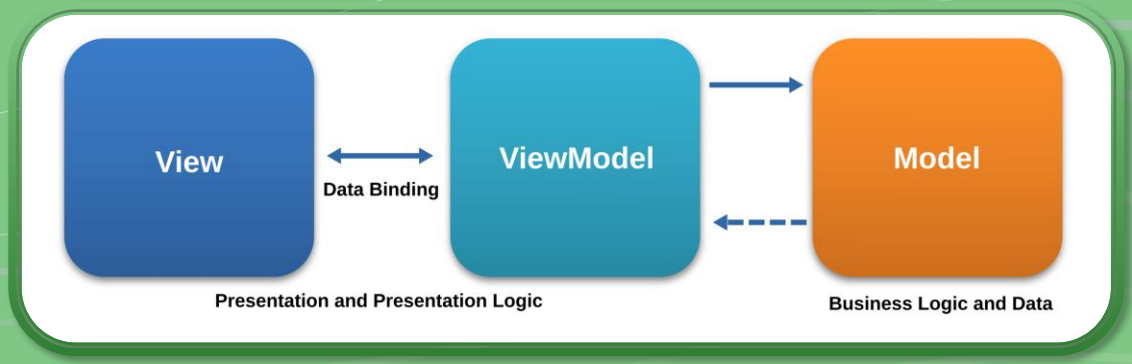
Modern Android Engineering

01

Kotlin + Jetpack Compose + MVVM Material Design principles

02

Room for local storage, Retrofit for APIs



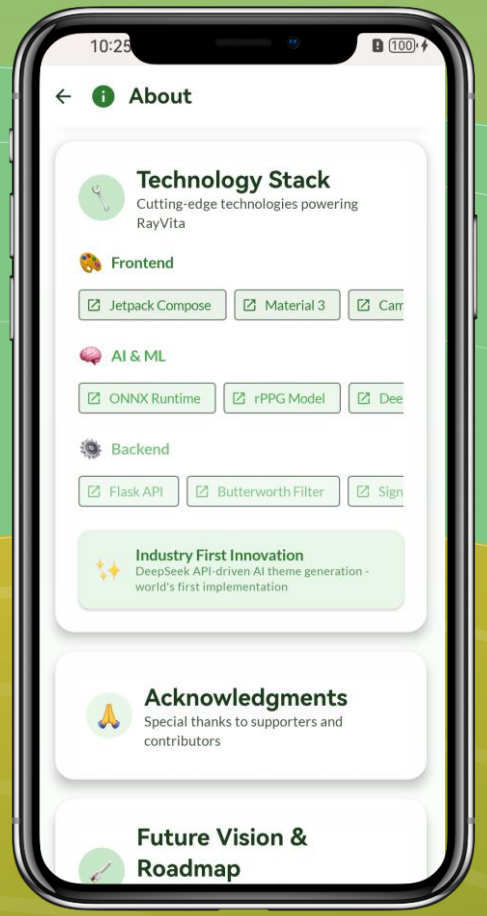
Kotlin

ONNX RUNTIME

ONNX Runtime integrated for edge inference: Integrated ONNX Runtime enables on-device machine learning, delivering low-latency, privacy-focused inference for intelligent features without relying on server-side processing.

API & AI Integration

Secure, Extensible Services

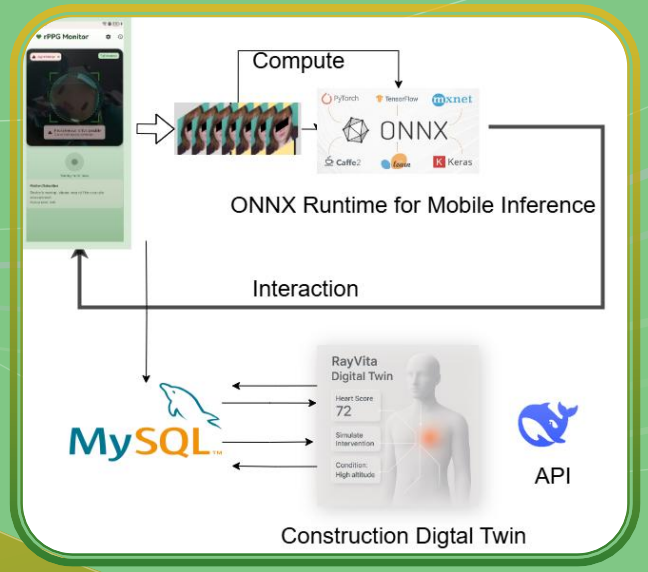


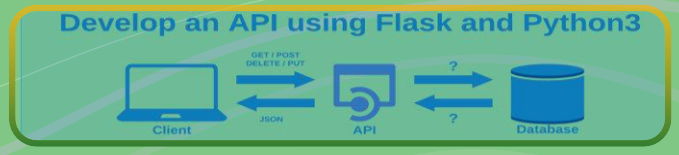
01

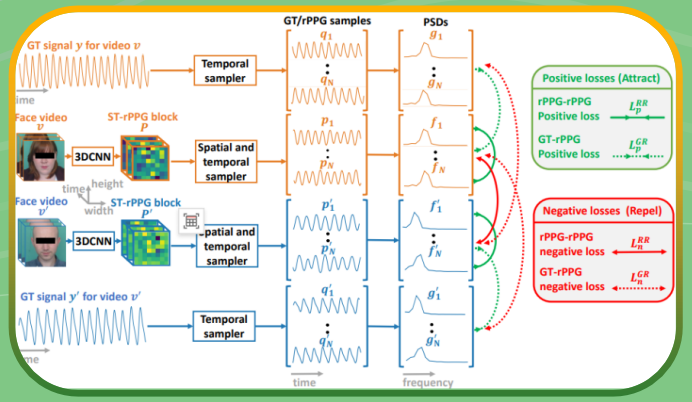
Flask REST APIs (Python), JWT Auth

02

DeepSeek AI integration (theme gen, chat, Tips)



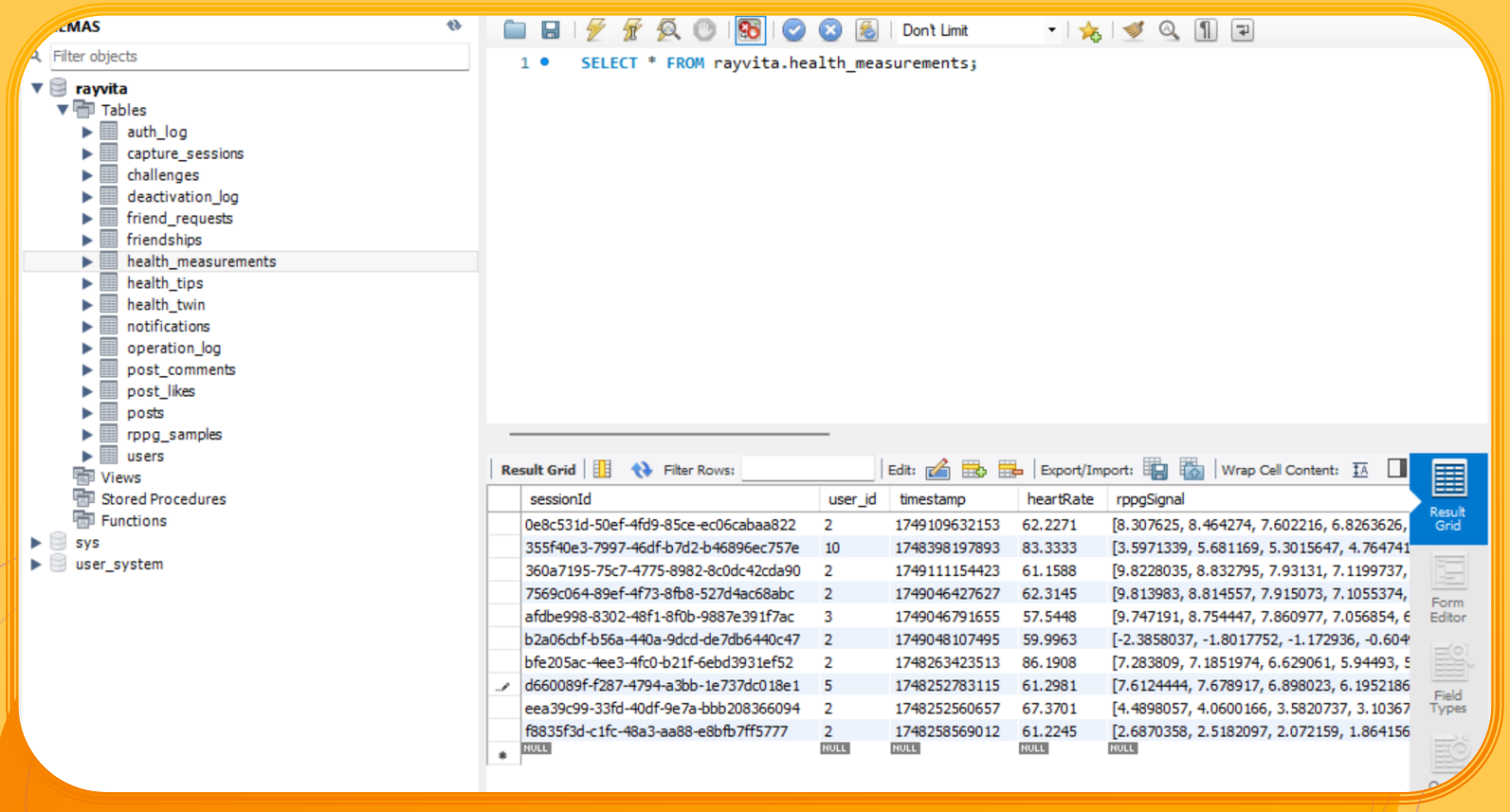


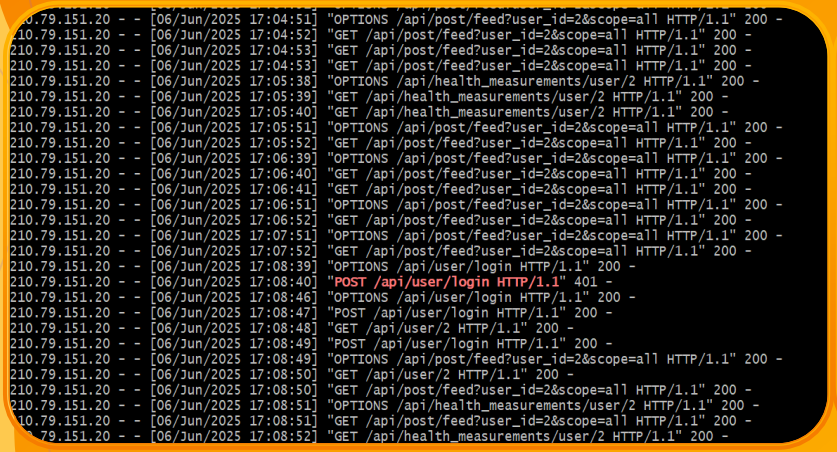


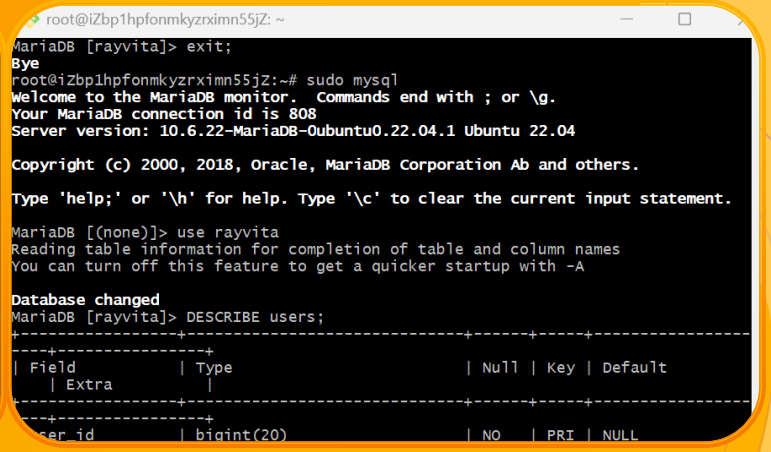
Contrast-Phys+ leverages 3DCNN for unsupervised/weakly-supervised rPPG measurement, using spatiotemporal contrastive learning to extract heart rate from facial videos, robust to missing or misaligned labels, enhancing on-device inference.

MySQL Database In Cloud Server

Hosted on Alibaba Cloud, MariaDB enables efficient CRUD operations for the rayvita database, supporting complex relational queries and high-performance data management for scalable backend operations.







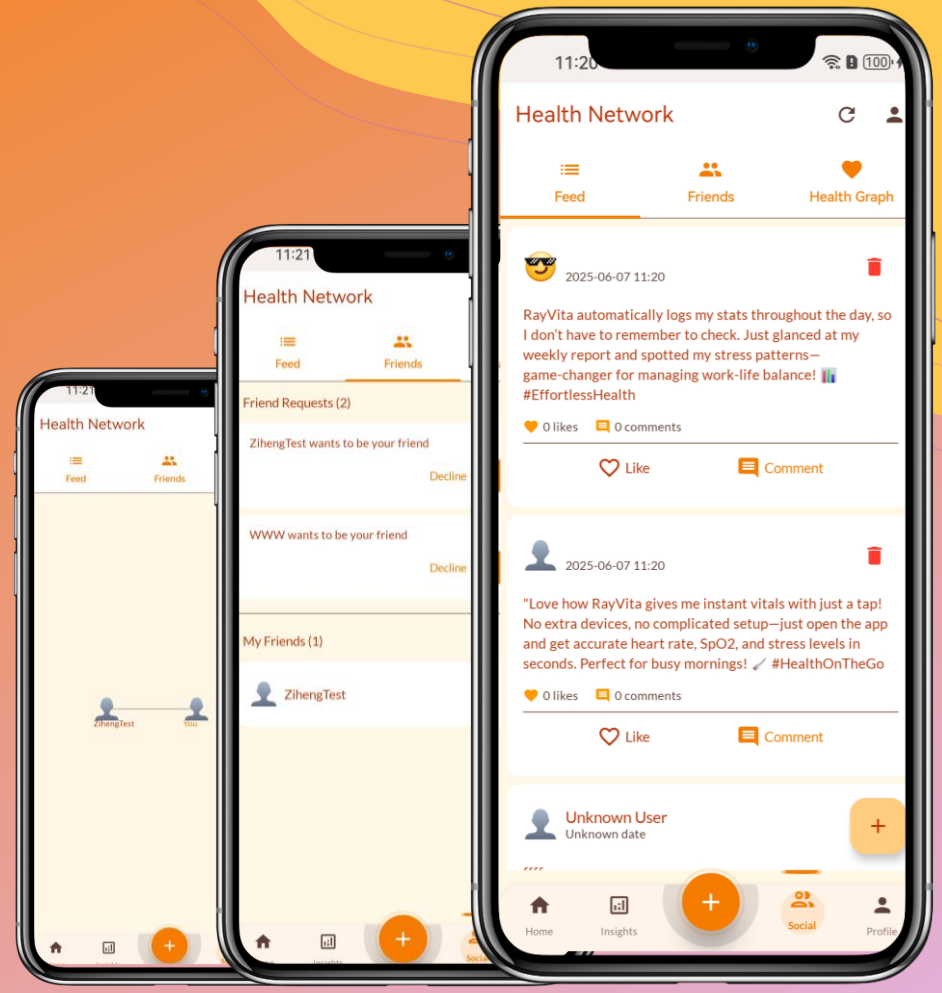
Community & Future

Now Friend requests, feed posts, achievements

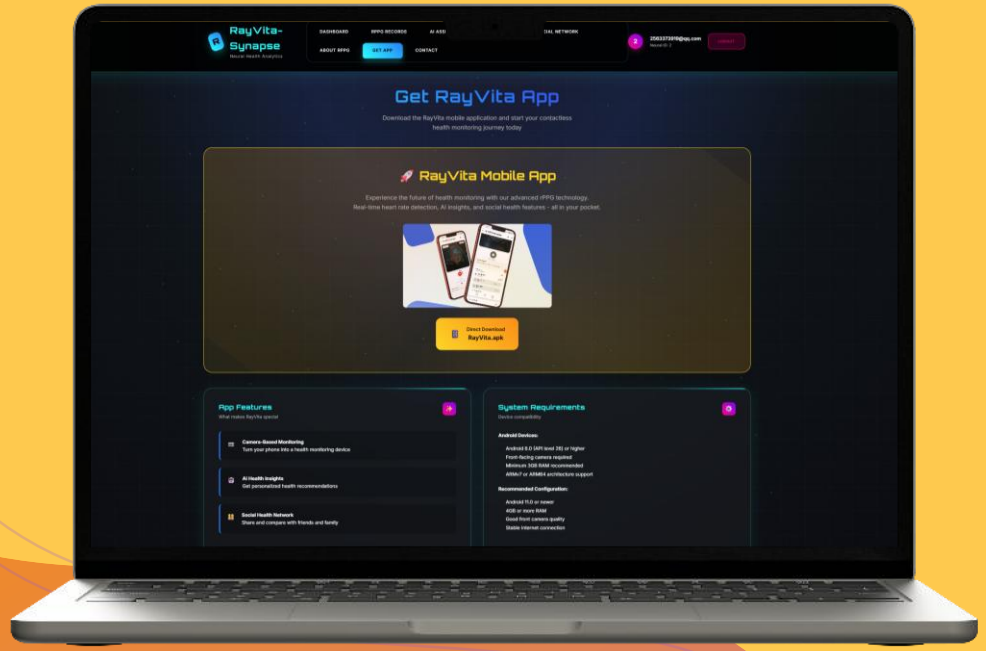
Future Share heart rate and HRV for collaboration and health insights.

Future Enable friend-based challenges to track physiological metrics, boosting motivation.

Future Support image posts for seamless visual sharing.



Cross-platform sync & Web Hub



RayVita-Synapse

RayVita-Synapse is a lightweight web version of RayVita, serving as a cross-platform hub for health data visualization and interaction. It offers heart rate measurement display, analysis, and comparison, plus social syncing for posts, comments, and friend connections. Designed for quick access and responsive use on desktop browsers.

VITA

Future Plan

Vitality

Atrial fibrillation detection from facial videos, enabling early identification of cardiac irregularities to enhance user health and longevity.

Insight

Emotion & stress tracking via video + CV, providing deep analysis of emotional states and stress levels for personalized well-being recommendations.

Technology

Real-time health data processing, utilizing advanced algorithms to continuously monitor and analyze vital signs with high accuracy and efficiency.

Action

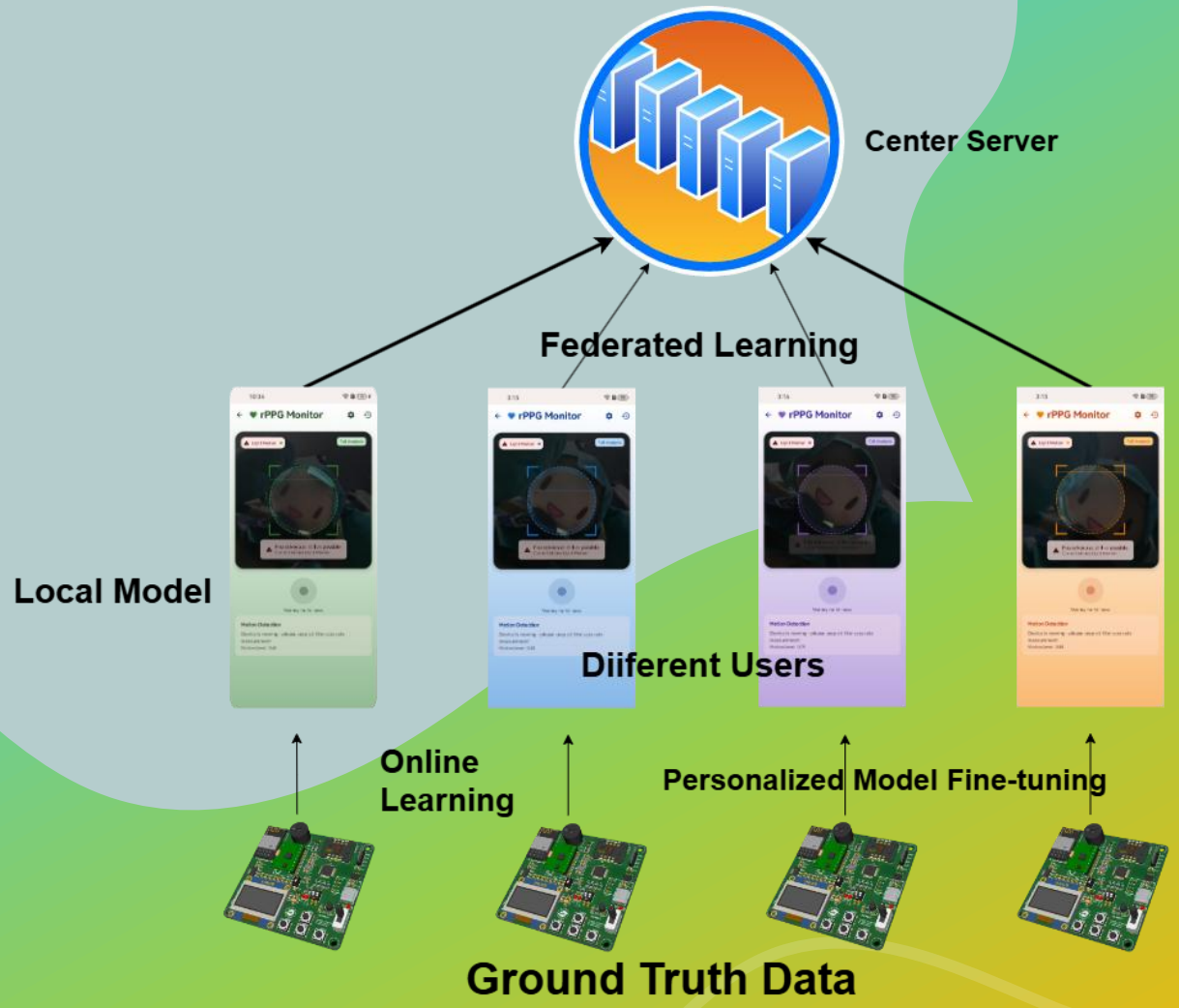
Personalized health improvement plans, HRV-based AI theme, offering tailored exercise and lifestyle adjustments based on data

What's Next?

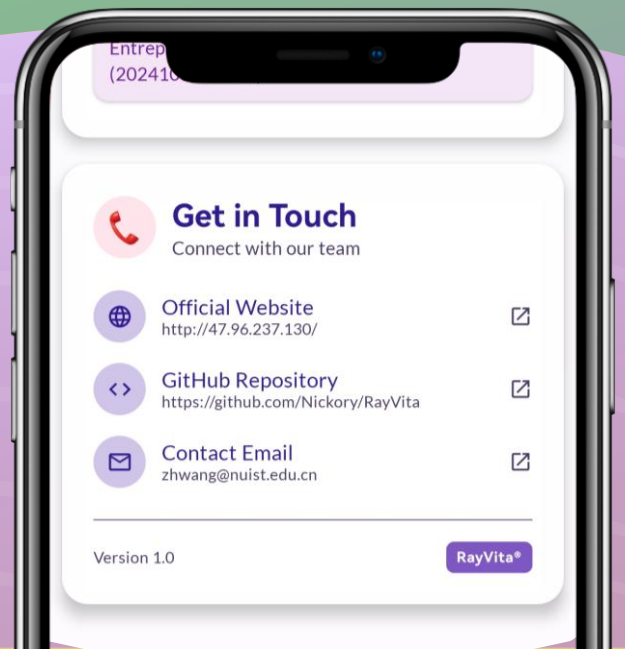
One More Thing

RayVita Perpetu Project

RayVita Perpetu is a derivative project of RayVita, focused on enhancing Android-deployed models for non-invasive heart rate and HRV measurement. It integrates hardware-collected ground truth (e.g., heart rate sensor data) for personalized model fine-tuning. Expanded to multi-user device collaboration, it adopts a framework combining federated learning and online learning, enabling local model training, shared updates to optimize a global model, and user privacy protection.



Thank You



Together, let's revolutionize health monitoring with rPPG, personalized insights, and collaborative innovation.