WHY ARE WE DOING THIS?

Problem Statement :

CREATE HEALTH MONITORING SOFTWARE FOR ASTRONAUTS ON SPACE MISSIONS

Imagine an astronaut travelling to Mars. They begin experiencing unusual physical symptoms, poor sleep and increasing psychological stress. Earth is millions of kilometres away, communication is delayed, and immediate medical support may not be available.

Who helps them understand what is happening and what to do next?

Astronauts are trained, but long missions create challenges that training alone cannot eliminate.

THE PROBLEM

On the way to Mars, help is almost an hour away

44 min

Round-trip signal delay at Mars’s farthest, before anyone on the ground has even read the message.

Five hazards, one crew

Radiation, isolation, distance, gravity and a closed cabin bring immune changes, bone loss, heart problems and behavioural health risks.

The crew is the first responder

On long missions, astronauts carry much of the responsibility for spotting changes in themselves.

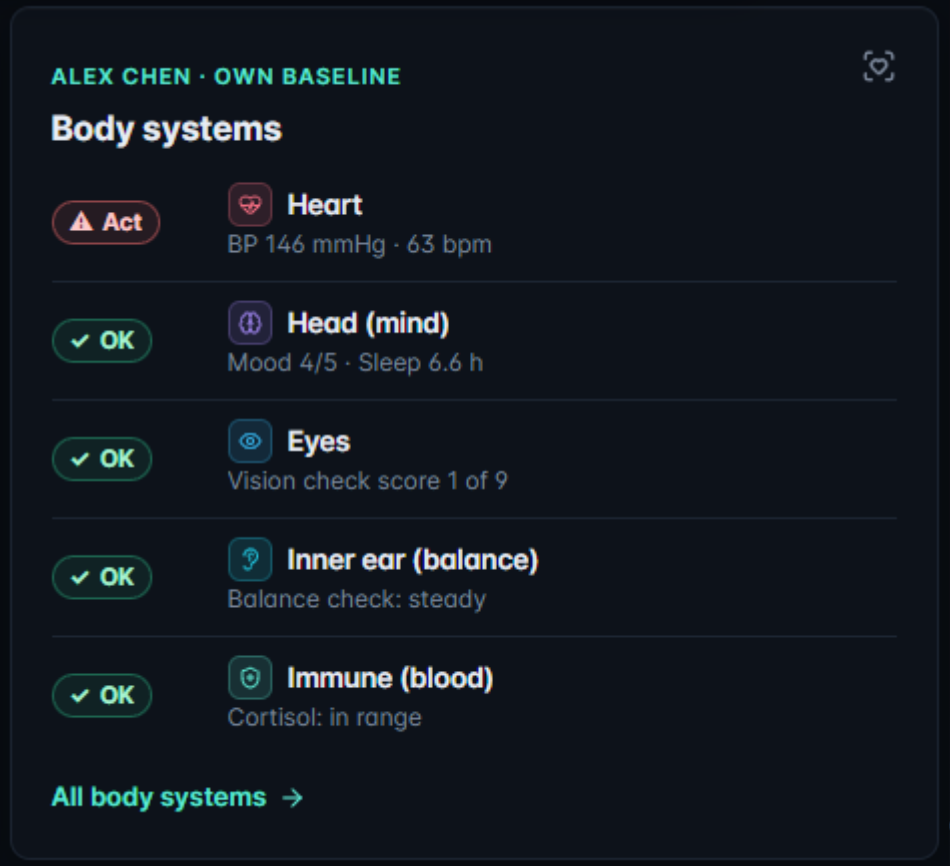
The missing question

A health dashboard shows what changed. It doesn’t say who should act, or by when.

Sources: NASA Human Research Program, five hazards; NASA Moon-to-Mars human health and performance; the challenge brief

THE SOLUTION TO A SAFE SPACE TRAVEL

ZeroG Buddies



NASA SPACE APPS 2026 · HEALTH MONITORING FOR ASTRONAUTS

Decision Window

The same reading means “ask Houston” in orbit and “your call” on the way to Mars.



Team Fr4nticZero

HOW IT WORKS

One comparison decides whose call it is

Time left to act
The action window for this reading, set per rule (a flight surgeon would set it)

vs

Time for Earth to reply
Two × the one-way signal delay, plus the ground team's response time

Crew decides now
Earth can't reply in time, or the link is down. Holding steps, and the whole crew is alerted.

Consult Earth, hold
Earth can reply in time. A countdown, holding steps meanwhile, and your buddy is alerted.

Monitor
Off your own baseline, no deadline yet. A re-check time and a trend projection.

Same reading, two answers. Blood pressure 146 against a baseline of 120, with a 30-minute window. Station: Earth replies in about 15 min, so **consult Earth**. Mars: about 59 min, so **the crew decides now**.

Action windows and ground response time are demo parameters, shown with a badge in the app

THE PRODUCT

Built for a crew on its own

Interactive body scan

Tap a body part to see what it does, why it's checked in space, and its status against your own baseline.

Daily check-ins

The six indicators NASA names, by keyboard, tap or camera, with a routine ring and streak.

On-board trend watch

Projects a slow drift days before it crosses a flag, on the device, with no Earth link.

Equipment and rover kit

A failed device, or one left at base on a rover traverse, blocks its steps and shows a fallback.

Buddy alert tiers

Self top-up, then your buddy and the medical team, then the whole crew when Earth is out of reach.

Decision ledger

Each choice travels with the real delay; a flight surgeon concurs or overrules, and that comes back delayed too.

Station, Moon surface, lunar rover and Mars transit · offline-ready web app · phone, tablet or laptop

LIVE DEMO · 60 SECONDS

One reading, two answers

01 **Station: consult Earth**

A blood pressure spike. Earth replies in about 15 minutes, inside the 30-minute window.

02 **Switch to Mars: your call**

Same reading. Earth needs about 59 minutes, so the crew decides now and everyone is alerted.

03 **Tap the heart**

What it does, why we check it in space, the trend, and holding steps with their kit and crew-time cost.

04 **Log the choice**

It queues for 22 minutes. The flight surgeon concurs, and the review comes back with the same delay.

WHY TRUST IT

Built to be trusted, not just demoed

Grounded in NASA

- NASA HRP five hazards and risks frame every view
- CSA radiation monitoring shapes the dose gauge
- Real Inspiration lab results and ISS cabin telemetry, kept historical and separate

Honest by design

- Every unsourced threshold and window carries a Demo badge
- Rules you can read, not a black-box model
- Trends are projections, never predictions or diagnoses

Works where it’s needed

- Runs fully offline once loaded: no cloud in the decision
- Phone, tablet or station laptop
- 136 automated tests on the decision engine and data

Prototype, not a medical device. Mission data is simulated; NASA research data is historical.

Whose call is it, and by when?

Beyond space

Ships at sea, polar stations, expeditions and rural clinics: anywhere help is far away, the same comparison applies.

Next steps

Connect real sensors, let flight surgeons set the action windows, and validate the rules with clinicians.

WHY US?

What makes our solution different?

Using the right DATA and Resources

We researched NASA's Exploration Medical Capability, its clinical decision-support research and the Canadian Space Agency's Bio-Monitor.

These systems demonstrate impressive work in wearable monitoring, medical technology and astronaut healthcare.

However, their capabilities are developed across different research programmes and technologies. Our approach is to bring physical and psychological wellbeing, health information, training simulations and accessible support together in one astronaut-focused webpage.

Using many data sets provided by NASA to provide the best outcomes!

WHY IS IT IMPORTANT?

Why does this matter in deep space exploration?

Offline access

- Unlike a system that depends entirely on communication with Earth, 0G Buddy is designed around offline access, locally available health information and support for delayed communication.
- It aims to help astronauts understand changes, practise responses and access essential resources independently.

Our mission

- We don't just want astronauts to survive space. We want them to stay physically healthy, psychologically supported and prepared for emergencies.

Our goal is to provide the best experience for the astronauts.

Resources

NASA Space Apps Resources Page

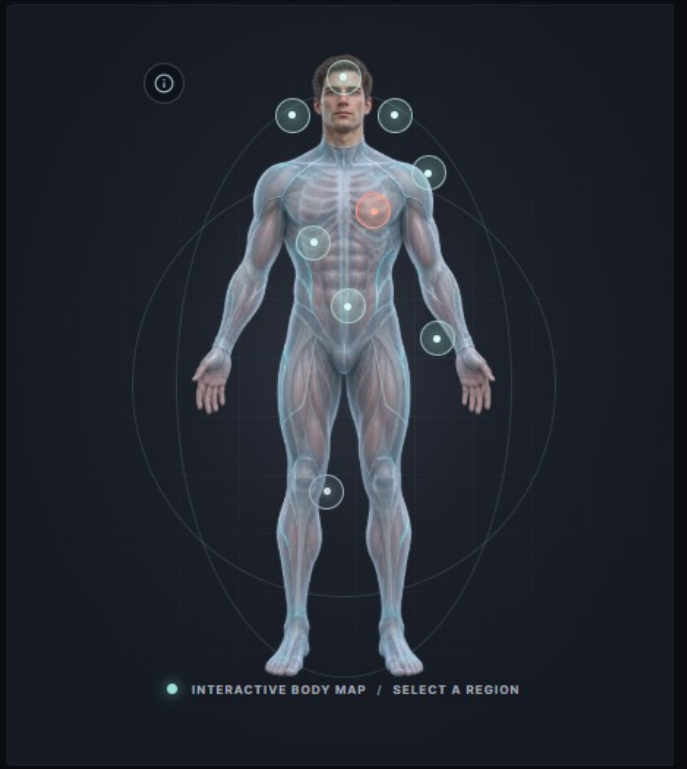
All our data were taken from analyzing the data, links and videos provided by NASA. We analyzed the previously made models of NASA for health monitoring and found the data they had used.

Other Resources

- Vercel (hosting)
- Github

NASA SPACE APPS 2026 · TEAM FR4NTIC ZER0

ZeroG Buddies : Your health companion, even when Earth is millions of kilometres away.



Team Fr4nticZero [Theyjashri, Mark, Sean, Faithful] [Athlone]