

PTSD Detection Device

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Client: BAE Systems / America's VetDogs | Advisor: Rachel Shannon

Problem: If a discrete and wearable device existed that is capable of detecting PTSD episodes, support for veterans with PTSD would become much cheaper, accessible, and faster than it currently is.

Solution: We are challenged with designing and building a prototype for a device that monitors the veteran's physiological data, detects PTSD symptoms in advance, and alerts a service animal that an episode is imminent.

Intended Users and Use Cases:

Users: Veterans or anyone experiencing PTSD episode, and service dog trainers

Uses: Prevent PTSD episodes before they happen, assist service dog trainers in determining when an episode is happening to train their animals more effectively, and provide researchers with physiological data that represents a PTSD episodes.

Operational Environment: Outdoor, public spaces where the potential for large crowds or loud events will take place.

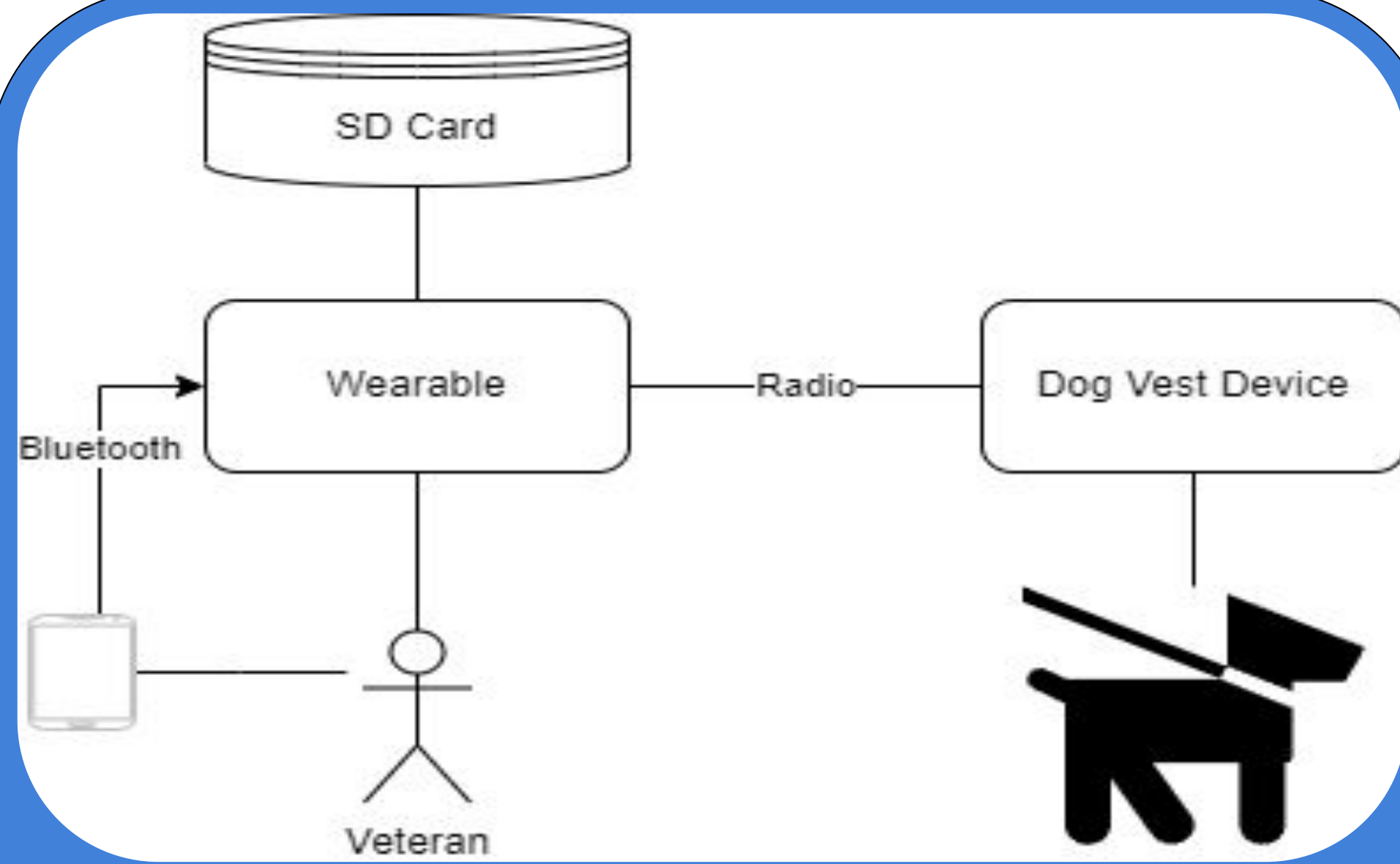


Figure 1. Top-Level Block Diagram

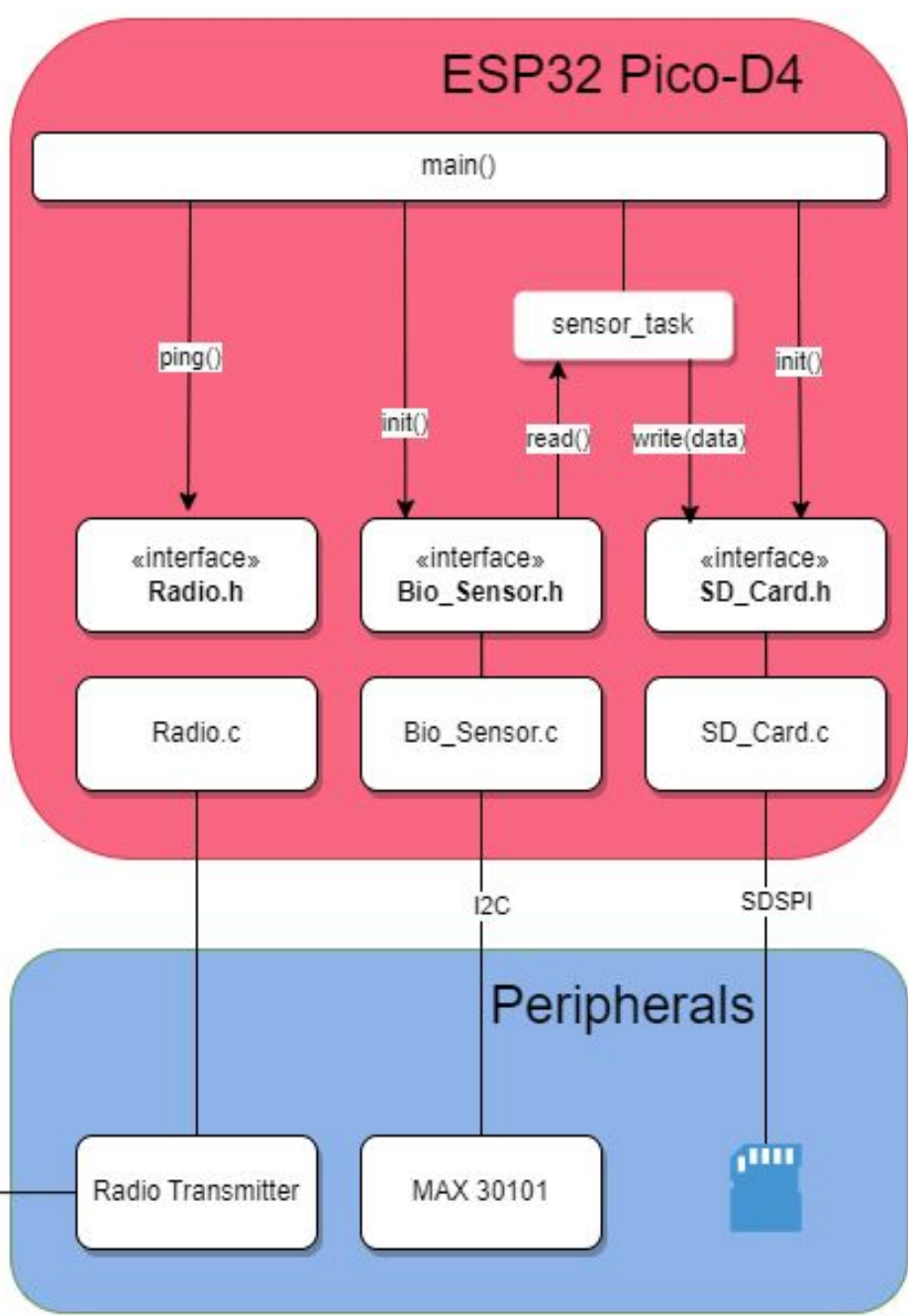


Figure 2. Software Flow Chart

Standards Used:

- ISO/IEEE 11073: Medical / Health Device Communication Standards
- IEEE 360-2022: Wearable Consumer Electronic Devices
- ICT Accessibility 508 Standards and 255 Guidelines: Government provided accessibility to those with sensory/physical disabilities.

Design Requirements:

Functional Requirements:

Our **wearable device** must...

- Reliably monitor the user's physiological data.
- Detect any abnormal behavior in blood pressure/heart rate consistent with a PTSD episode.
- Communicate with a device on the service animal that a PTSD episode is imminent.

Our **user** must be able to...

- Dismiss the collar device on the service animal before the service animal is notified.
- Power off and on the device

Non-Functional Requirements:

- A phone application has been considered to go alongside the wearable device. This application would allow users to track their PTSD episodes.

Constraints:

- Collar device notification must be subtle as to only alert the service animal and not the general public.

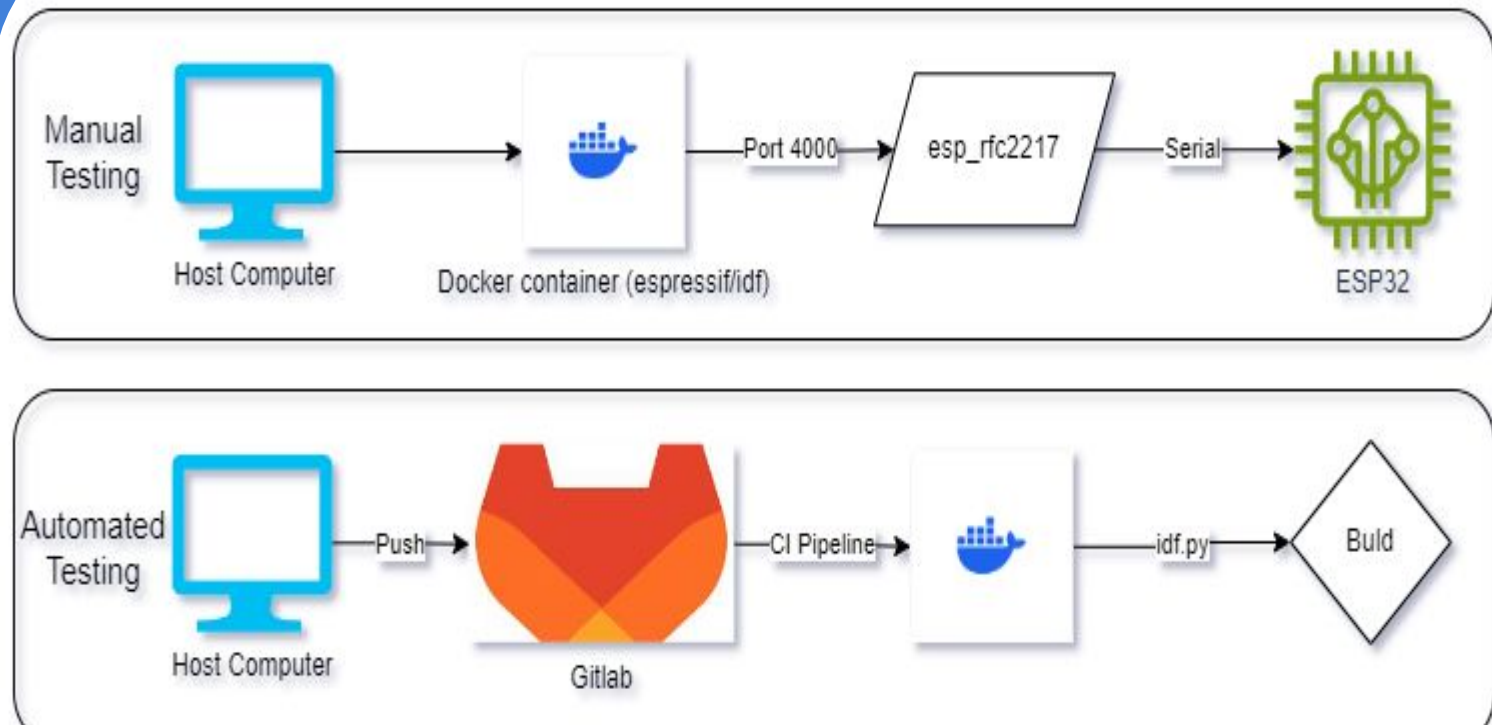


Figure 3. Testing Process Diagram

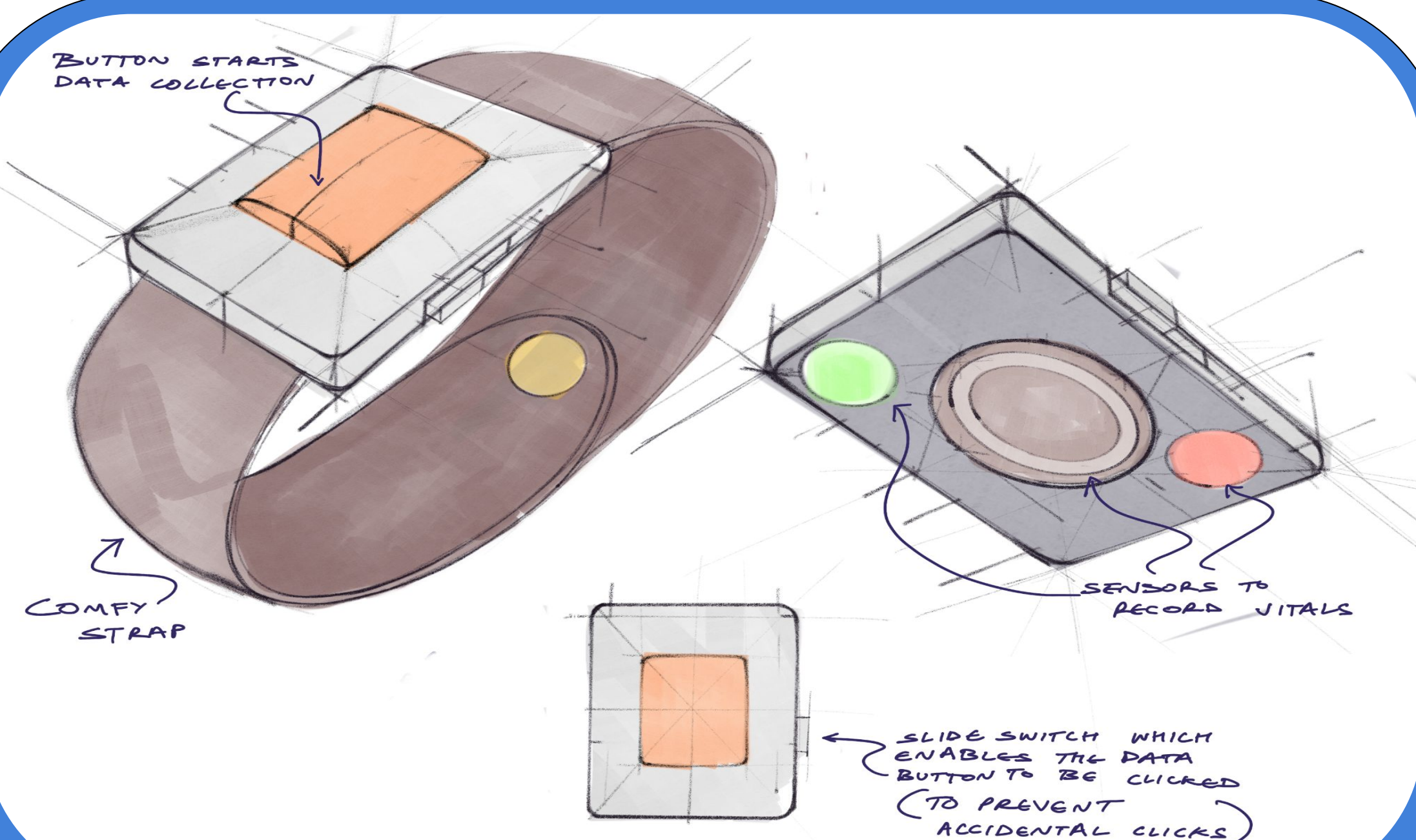


Figure 4. Final Product Concept Sketch