Walkie

An M5StickS3 wrist voice remote for Claude Code—keeping every high-risk tool approval locked to deliberate physical key presses.

Physical AI · Tactile Control

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01 · Core Design Tradeoff

Bind tool approvals to physical watch buttons rather than spoken 'yes'

Human tension: Stepping away from the desk leaves an autonomous coding agent stalled on a single permission prompt, yet speaking commands aloud in shared spaces creates privacy discomfort and makes accidental approval feel effortless.

Alternatives rejected:

- **Hands-free voice confirmation ('Yes, run it')** — Speech-to-text cannot distinguish deliberate user intent from background conversation or media audio, offering zero tactile boundary before a destructive shell command executes.
- **Mirror the full terminal session on a phone screen** — Pulling out a phone re-exposes notifications and drags a two-second decision back into full-screen desktop context switching.

Chosen tradeoff: Asymmetric physical key grammar on M5StickS3: hold the Front Key to record press-to-talk audio, press Front Key to approve, press Side Key to deny (with an optional spoken reason), and require a 30-second physical Front Key press to pair any new PC.

02 · Key Interaction Rule

Compress context into spoken summaries and explicit offline diagnostics

The Node 24 bridge distills replies into short spoken summaries, USB always preempts the AES-256-GCM Fly.io relay when plugged in, and OFFLINE screens distinguish no-Wi-Fi, relay-unreachable, and PC-bridge-offline explicitly.

03 · Key Interaction Rule

Enforce sibling-partition flash guards and button-confirmed key pairing across shared hardware

firmware/guard.py blocks -t erase and -t uploadfs pre-flash, pairing locks an AES-256-GCM shared key to pair.key only after a 30-second physical Front Key confirmation, and Fly.io routes opaque binary envelopes without decrypting them.

Role & Scope

Solo · Product direction, interaction rules & on-device checks

Dual-boot S3 key-locked approvals

ESP32 C++ · AES-256-GCM · Node 24

3 manual hardware/relay gates

Honest Scope & Limits

Single developer (Lewis) has used it; no external user study has been run.

Have 2–3 Claude Code users test an approval-heavy session away from their desk.

Scan for Live Prototype

https://lewisdong.vercel.app/en/projects/walkie#interactive-demo

MazeRunners

Two players share one wristband control—forcing physical coordination across sensors, finger-sleeve haptics, and a live web scoreboard.

Physical Computing · Co-Play System

2026 · exhibited live

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01 · Core Design Tradeoff

Couple direction controls across players instead of issuing solo controllers

Human tension: With one control per person, each visitor can play alone and nothing makes the group act together.

Alternatives rejected:

- **Buttons and a joystick (the first concept)** — Rejected as too much like an arcade game.
- **Weight sensing or a five-finger pressure pad** — Considered but never tested; the team went with shared conductive wristbands.

Chosen tradeoff: Pair shared color wristbands across players (A/B, B/C coupling) so no single person can drive any direction alone, while wiring instant visual, audio, and haptic cues into one round state machine.

02 · Key Interaction Rule

Replace electric shock with sleeve haptics and debounce every IR trigger

Relay-driven vibration motors in finger sleeves keep feedback on the body, each IR sensor needs three consecutive samples and then cools down for 400 ms so one ball pass is one round event, and servo tilt runs on its own Uno (SafeTouchServoController).

03 · Key Interaction Rule

Drive both real Mega hardware and browser Demo Mode from one Web Serial protocol contract

The JS Canvas console shares one event dispatcher: when USB Serial connects to Arduino Mega it logs live traps and relays; without hardware attached it replays the exact same trap, score, and haptic state transitions deterministically in the browser.

Role & Scope

Lead Interaction & Hardware/Web Dev

- Wrist co-touch & haptic traps
- Arduino Mega · 10 IR · Web Serial
- Publicly exhibited · 9 groups (36 players)

Honest Scope & Limits

Exhibition play was observed, not instrumented.

Log sensor events, feedback fires, and completion times per session, then compare rounds with channels selectively disabled.

Scan for Live Prototype

https://lewisdong.vercel.app/en/projects/maze#interactive-demo

On The Beat

Breaks the ice between two gig-goers without phone staring—revealing names and meet spots only after mutual wrist confirmation.

Social Wearables · Ambient Consent

2026 · coursework build

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01 · Core Design Tradeoff

Use blind waves and mutual consent before revealing names, then let devices withdraw

Human tension: At a dark, loud live gig, wanting to say hello to someone nearby carries real social face-loss anxiety if you misread the room—yet pulling up a bright social-feed screen breaks eye contact and kills the music moment.

Alternatives rejected:

- **Nearby-people radar showing faces, profiles, and bios** — Turns an intimate gig into swipe-style appearance ranking and creates surveillance discomfort when neither person asked to be browsed.
- **Unconditional proximity alert or auto-revealed identity on one wave** — Creates unwanted interruption and unilateral exposure without symmetric consent.

Chosen tradeoff: An initial wave transmits only anonymous presence ('someone nearby waved') across three low-stakes Figma prompt cards (SAY HI, FIRST SONG?, LET'S DANCE! from a teammate's concept); names and a shared meeting landmark unlock only after both nod, so both phones can go right back into pockets.

02 · Key Interaction Rule

Remove the laptop with an always-on relay and reject deceptive AI UI drafts

Enforced bidirectional state through an always-on Fly.io Sydney relay, verified real MEET agreement across StickS3 and StickC Plus wristbands, and sent generated design canvases back across 5+ rework rounds (12+ on the earlier canvas) until every state transition held.

03 · Key Interaction Rule

Let the ESP32 wristband side button drive state transitions back to the phone

Wire StickS3 and StickC Plus side buttons as first-class state emitters across the Fly.io relay so band cycling updates React in real time, then leave the phones to show first names and where to meet once both say yes.

Role & Scope

Individual build of DECO3500 team coursework · Interaction rules, AI output review & wristband pairing

Mutual-nod identity reveal

ESP-NOW Wristband · Mobile Web · Fly.io

Verified live on 2 paired wristbands

Honest Scope & Limits

There is no record of any participant testing the app.

Run a staged gig session with pairs of participants and observe whether they meet.

Scan for Live Prototype

https://lewisdong.vercel.app/en/projects/onthebeat#interactive-demo