Partners with your patients to improve their breath regulation, precise interval fitness, and self-regulated brain fog reductions.

Stress Management Program: The Wellness IP System uses a forehead skin patch to record brain wave data and pulse oximetry, providing recommendations for clinically based and personal behavioral stress management programming.

C.S. FIELD SESSION
Advanced Software Engineering

Cobalt Incorporated, a Golden-based consumer health startup, brings advanced physiologic monitoring technologies to market!

We want *your* help with an interesting consumer wellness device.

Start here:
https://en.wikipedia.org/wiki/Pulse_oximetry
https://www.wellnessip.com

Our new wearable uses a non-invasive optical method to continuously measure blood oxygen saturation. That data is captured, analyzed, and delivered to a clinician and patient.

We need your help to understand & calibrate our new reflectance pulse oximeter!

New Prototype Consumer Wellness Device

We have new hardware ready to go. The team will receive a prototype that transmits continuous blood oxygen saturation data from your forehead to a PC laptop. We also have a "gold standard" pulse oximeter that measures data from your finger.

We need the data from the forehead sensor to match the gold standard fingertip sensor!

The data collection software on the laptop requires some modification for this experiment. It is our code, written in C #. Your first task will be commanding the hardware to illuminate certain LEDs in a certain order.

Now the tricky part! The raw data from this new forehead pulse oximeter acts differently on different people! Different skin colors, different bone thicknesses, different amounts of tissue and hydration all affect the final result.

We have a proprietary method to extract calibration data, but we don't know what to do with it! This may be a case for immediate application of AI or ML to observe the behavior of the pulse oximetry raw data waveforms and calibrate to the gold standard.

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Tasks:

- Begin modifying the data collection system in C#
- Start some data collection to Amazon Web Services data servers
- Begin investigating SIMPLE implementations of AI / ML (Tensor Flow?)
- Apply machine learning to the data set (Tensor Flow?)
- See if we can generate a calibration curve / calibration constant
- **Stretch Goal** - Do the above for acoustic information related to breathing!
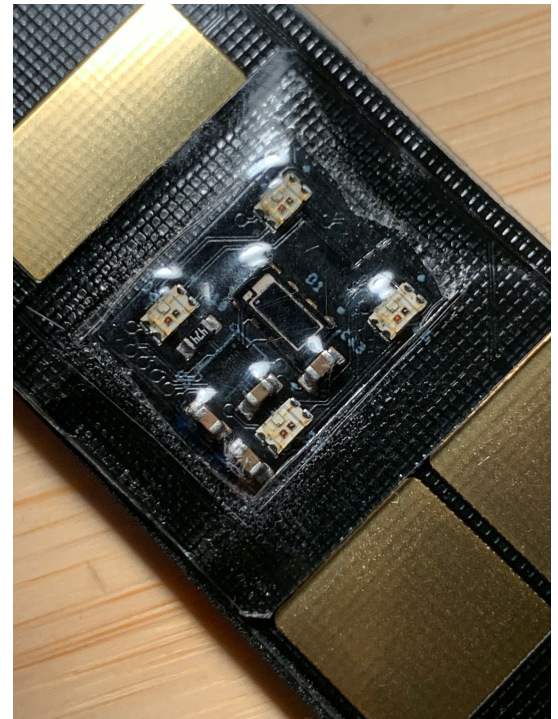
Schedule:

Sprint 1: Intro, definitions, access to tools, pick a Project Manager
Sprint 2: Specific requirements, begin work
Sprint 3: Implementation, Check-in
Sprint 4: Implementation, Check-in, Course Correct
Sprint 5: Implementation, Check-in, Final Update
Sprint 6: Final Tweaks, Presentation

Technologies:

- C# Data Acquisition
- AI or ML needed for waveform behavior classification (Tensor Flow?)
- AWS Servers (probably)
- Optical / physiologic data manipulation
- Generate CSV files
- GITLAB Repository
- Agile Tool = Jira

Specifics:

- Mostly zoom, maybe 1-2 onsite meetings in North Golden (near Cannonball Brewery)
- Simple "work for hire" and NDA gives us ownership to your code. (See CPW)
- No required "work hours". We will have a single 1-hour meeting every week.
- Guidance from senior engineers
- Potential Internship after the project is over
- If we do meet onsite at our facility... No Dress Code! T-shirt and Flip-Flops are OK
- Team Size 3-6
- *p.s. We're the Fun Team!*

Contact:

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