

## C.S. FIELD SESSION

# Advanced Software Engineering

SomnoHealth Incorporated, a Golden-based consumer health startup, wants *your* help with an interesting "big data" project!

Start here:

[www.GetEverSleep.com](http://www.GetEverSleep.com)

EverSleep brings in-hospital laboratory grade sleep technologies directly to the consumer - to monitor and improve sleep.

Sleep measurement happens in our new sleep wearable device, and that data is BTLE transmitted to our mobile phone app. Inside the app we perform complicated analyses and deliver clinically based sleep improvement coaching directly to the user.

Our server collects anonymized data every morning from our users and beta testers - 15,000 lines of data per user, per night. *We've got lots of data, and lots more coming in...*

*We need you to build a "Corporate Wellness Portal" so that companies can "look" into our server and see how their employees are sleeping*

# Corporate Wellness Portal

We already have a "portal" (built by a team from CSM!) that lets us "look" into the server and retrieve EverSleep user data. However this portal is designed for engineers, and has some dangerous features... i.e. a user can delete the entire 20,000 night database!

We need an improved portal that lets our customer (a local large company) view a beautiful web-front end, with password security, and they can look ONLY at the sleep information for THEIR employees, and not the rest of our entire database. It needs lots of cool reporting, graphs, summary and trending statistics, etc.

=====

## USE CASE:

A local commercial trucking company has 20 drivers. The trucking industry is notoriously sensitive about sleep apnea. A truck crash kills or injures someone in the US every 14 minutes! About 1/2 of those crashes are fatigue related.

So, the trucking company purchases 20 EverSleep units, and a "subscription" to the portal.

The "subscription" gives them access to a beautiful web viewer - which lets them register each truck driver and automatically downloads (emails?) sleep reports from the server daily.

A summary report is also generated....

"These 10 drivers are doing just fine, these 3 drivers haven't used EverSleep in more than 1 month, and these 5 guys REALLY need to go to the doctor!"

=====

These tasks are in order of priority, **and** in order of complexity. How many can we finish?

### 1. Security

1.1. We need to use OAUTH2 and JWT tokens to authenticate the inbound request.

### 2. Web Viewer

2.1. Simple, beautiful web-based viewer that lets us build a "group" (of truck drivers for instance) with user names, passwords, etc.

2.2. Reporting - output of summary PDFs, cool graphs, charts, etc.

### 3. Machine Learning - Stretch Goal

3.1. Given a specific user, can you make predictions about his outcomes over time, based on similar users?

## 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:

- JSON Data
- OAUTH2 & JWT Tokens
- AWS Servers
- JavaScript / Node JS (Current Portal)
- Relational Database (SQL or clone)
- GITLAB Repository
- Agile Tool = Taiga
- [See photos and a sample file below!](#)

## Specifics:

- Work from home, from school, or on-site in North Golden (if you want to)
- No required "work hours" (i.e. 9-5)
- Guidance from senior engineers
- You'll have lots of leeway to bring new technology!
- Potential Internship after the project is over
- Probably 1 hour meeting onsite per 2 weeks (near Cannonball brewery)
- No Dress Code! T-shirt and Flip-Flops are OK
- Team Size 3-5
- p.s. We're the Fun Team!

## Contact:

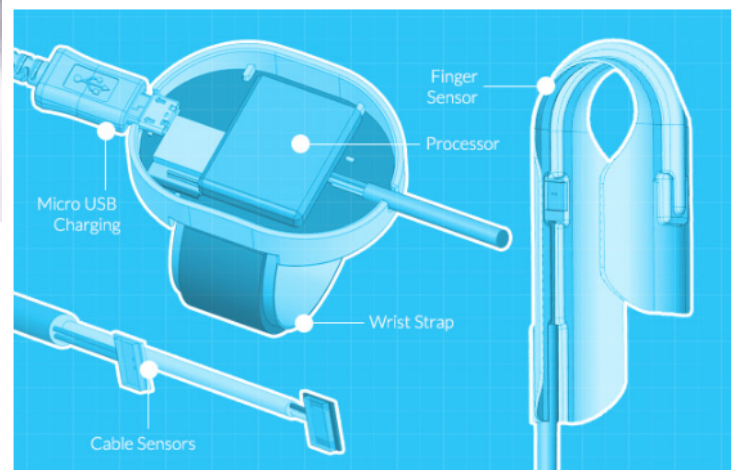
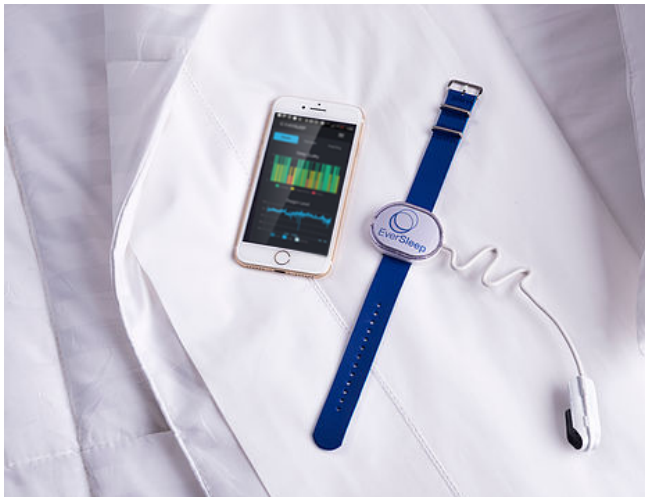
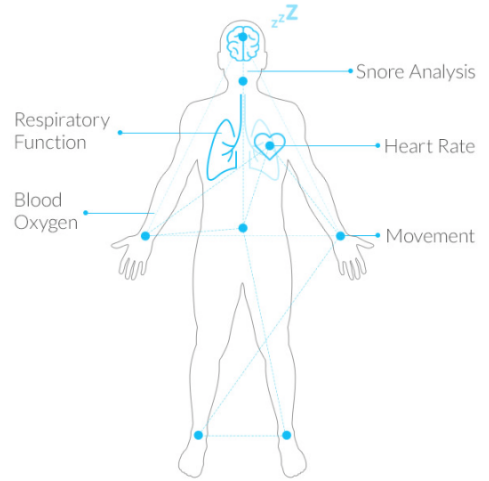
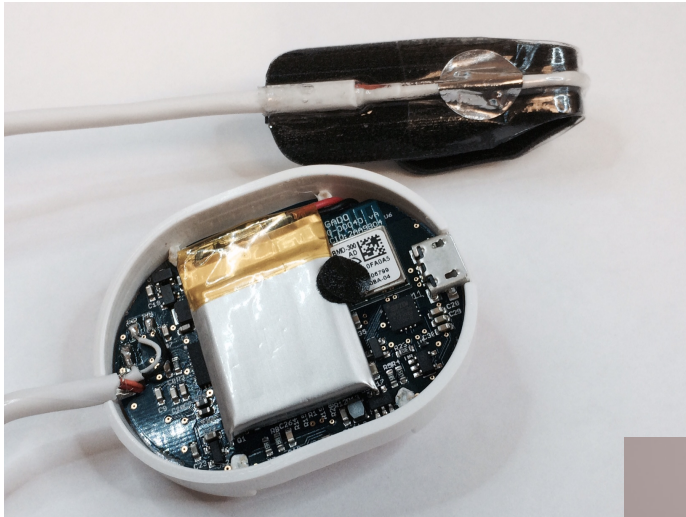
Chris Crowley - Founder  
720-232-9000  
Somnohealth Incorporated  
1440 Brickyard Road #2  
Golden CO 80403  
[chris.crowley@GetEverSleep.com](mailto:chris.crowley@GetEverSleep.com)

p.s. If anybody wants to purchase an EverSleep from our website... here is a secret code for the employee \$20 discount: SAVE20

[www.GetEverSleep.com](http://www.GetEverSleep.com)

# What's Different About EverSleep?

EverSleep uses advanced **sleep-lab technology** to provide the data and coaching you need at home.



```

"id": 2011,
"startTime": "2018-02-13T08:49:30.000Z",
"endTime": "2018-02-13T14:35:00.000Z",
"endReason": "manual",
"analysis": {
  "startTime": "2018-02-13T01:49:30-07:00",
  "pr50": 0,
  "pr90": 0,
  "tib": 20730000,
  "tst": 19920000,
  "twt": 1140000,
  "qst": 14100000,
  "frag": 5820000,
  "error": 0,
  "qualitySleepPercent": 68,
  "od2": 71,
  "odi2": 12,
  "od3": 34,
  "odi3": 6,
  "pr10": 52,
  "pri10": 9,
  "mf": 121,
  "mfi": 21,
  "arousalsPerHour": 10.301204819277109,
  "baseFragmentation": 180,
  "longestQst": 3180000,
  "so": "2018-02-13T02:00:30-07:00",
  "sol": 420000,
  "sol0To30": true,
  "sol30To60": false,
  "sol60Plus": false,
  "waso": 900000,
  "waso0To10": false,
  "waso10To30With": false,
  "waso10To30Without": true,
  "waso30PlusWith": false,
  "waso30PlusWithout": false,
  "sleepGoal": 0,
  "diaryNotesPointer": null,
  "bedtimeDiff": 10170000,
  "time88": 67000,
  "eai": 0,
  "eai0To30": true,
  "eai30Plus": false,
  "odiRelation": null,
  "wasoCorrelation": null,
  "sleepLoss": null,
  "highSpo2": 99.6,
  "lowSpo2": 79.1,
  "highPulseRate": 118,
  "lowPulseRate": 54,
  "spo2Time90To100": 20577000,
  "spo2Time80To90": 117000,
  "spo2Time70To80": 6000,
  "pulseTime90Plus": 260000,
  "pulseTime80To90": 1193000,
  "pulseTime70To80": 11764000,
  "pulseTime60To70": 6524000,
  "pulseTime50To60": 959000,
  "pulseTime40To50": 0,
  "pulseTime30To40": 0,
  "longestDurationPulseRateGreaterThan90": 180000,
  "longestDurationPulseRateLessThan50": 0,
  "sleepOnsetInsomniaDuration": 0.

```