



DESTINATION STARTUP

Earable, Inc.

One-Sentence Summary of What You Do: Earable aims to revolutionize cognitive healthcare with smart earphones that improve human's cognitive functions. Our pioneering work is at the intersection of breakthrough wearable sensing, signal processing and machine learning. We are commercializing the world's first and most advanced in-ear health improvement platform for sleep, health, and other monitoring applications.

Affiliated Institution: University of Colorado Boulder

Have you formed a company yet? Yes

Funding/Financing: Venture Capital

Please describe your company and the problem you are trying to solve: According to the World Health Organization (WHO), one in three adults don't get enough sleep. Sleep studies in hospital settings that use polysomnography (PSG) can cause anxiety, are uncomfortable, delay the obtainment of medical information, and are expensive. Currently, 26 million people are seeking a sleep tracker in the U.S. alone.

Earable, Inc. introduces smart earphones that can monitor and improve sleep quality in real time. Earable's recent validation in the hospital show that it is 95% as accurate as the gold standard device (i.e. PSG) currently used in hospitals and clinics.

The Earable technology is a suit of sensing technologies that capture head-based signals such as brainwave (EEG), eye motion (EOG), facial muscles (EMG), head motion, and more from inside or around the ears. Our proprietary machine learning software separates the signals and allows for analysis by the user on a smartphone or tablet. The data enables high fidelity biometric quantification. In addition to the sensing hardware, our device includes a microphone and speaker to improve sleep in real time by playing white noise, doing relaxation therapy, adjusting home temperature, and other clinically proven sleep improvement strategies to help users to fall sleep faster and sleep better.

The patent family of Earable is envisioned to include 27 in total, five of which has been filed to USPTO. Earable has obtained an exclusive license from CU for the aforementioned five patents and their improvements. Furthermore, Earable has received interest for sub-licensing from a personalized education company and a CPAP company in the U.S.

What is/was your go-to-market strategy? Half of the world population lacks access to basic healthcare. Health issues like sleep can permeate all aspects of life, leading to a societal problem of



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unmatched severity. Sleep is not only a massive health problem but often a root cause of many health issues such as stroke or obesity.

The total addressable market for sleep improvement worldwide is a staggering 2.1 billion people, including 26M people who are currently seeking a sleep tracker in the U.S. alone (excluding those who are unable to afford our product). While our ambition is reaching as many people as possible, we are focusing initially on our early adopter market which includes 500,000 individuals in the U.S. with a number of specific demographic characteristics such as income, gender, and age. Saturating our early adopter market would provide \$175M + \$60M/yr if we sold a unit cost of \$350 + \$10/mo subscription.

The sleep improvement market is growing at a 18.5% CAGR and the mobile healthcare market is growing at 38% CAGR, resulting in an increasing TAM over time.

The most similar product to Earable are the Philips Smart Sleep, DREEM or Neuroon Open. Unlike these products, Earable's slim form factor virtually disappears from your awareness after applying, allowing you to sleep normally while taking better data-based sleep improvement actions than what other devices can provide. We found that form factor is a significant element in purchasing decisions and thus have a significant competitive advantage. Earable provides an order-of-magnitude improvement over other devices.

How will/do you generate revenue? Initial pricing to consumers will be \$350/each and additional \$10/month subscription for machine learning biometric analysis. Over time, the price will be reduced to \$175/each and \$5/month subscription. This places Earable in a competitive position relative to other wearable and improvement devices, yet with much higher accuracy and thus sleep improvement capability. Initially, we will sell a small quantity of devices to researcher for \$800/each, as is competitive with the OpenBCI product often used for nonconventional biosensing.

We are also vetting alternative revenue streams including a medical pathway with an insurance code enabling a price point up to ten-fold higher. Additionally, as our data assets on cognitive load, emotion, product focus, location and similar data will grow over time, we will be able to offer unique value to other businesses. Large companies already pay for approximation of this data but Earable can offer the data they actually desire more directly. The consumer subscription revenue streams also offer significant future upside through tiered pricing and a developer marketplace where independent creators can contribute new, mobile health software to run on the Earable platform.

How will this showcase benefit your company or technology? This showcase will be significantly beneficial to building out our connections to the community, and continuing to learn best practices for lab spinoff ventures. Our current endeavors include customer discovery, prototype development, partnership assessment, and active team recruitment. As a result we have much to offer the community and value to be gained through the showcase.



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Earable has received an early interest in our technology from industry players that could lead to funded co-development opportunities or other partnering arrangements. We anticipate that there will be continued R&D funding support from Federal Programs as well.

We are also actively seeking funding and have received seed capital from a VC group and are in the final stages with another group.

Finally, team members of interest include computer science (full-stack, data-processing, and ML), electrical engineering (both analogue and digital), and other engineer and design roles.

Who are the members of your team and why is this the right team to get the job done?

- Founder and CEO: Dr. Tam Vu — an assistant professor at the University of Colorado Boulder, where he founded and directs the Mobile and Networked Systems (MNS) laboratory. He has raised \$5.5M to operate the lab in the last six years.
- Co-founder and CMO: Dr. Robin Deterding — a tenured professor of Pulmonary Medicine in the Department of Pediatrics at the University of Colorado School of Medicine and Children's Hospital. She is an internationally known pediatric pulmonologist, and executive leader of one of the biggest pediatric breathing operations for children in the country and a serial entrepreneur committed to improved care models for patients.
- Part-time CFO and former CFO of SomaLogic, Inc.: Scott Kothlow — Currently a financial and operational advisor to early-stage biotech, med device, and life science companies.
- Product & Business Development Manager: Ted Thayer — previously worked for the Laboratory of Atmospheric and Space Physics as a Research Engineer while taking master's classes and co-founding two companies, one of which he led as CEO.
- Earable engages with a business partner, Zebulon Solutions, for product design, and signs the Advisory Agreement with some leading experts such as: Scott Fox, 40+ years in global telecommunications, and entrepreneurial development (Bus. Advisor) and Dixon Dick is a 36-year veteran of tech industry (Bus. Advisor) to help support us with marketing, production, management and distribution to achieve market success.