

# 2021 Annual Report

The mind.  
Unlocked.

# NEURABLE

January 2022

## DEAR FRIENDS OF NEURABLE



I'm so pleased to present you with this annual report. It highlights the truly groundbreaking work your support allows us to do. It also describes our successes this year and the exciting path forward for Neurable. I would be remiss if I didn't first thank you for your assistance. It's because of each of you that we've been able to harness the right employees at the right time and collectively continue the brain-computer interface work that has the potential to profoundly change lives.

While we're creating, cultivating, developing and producing, we, too, are affected by the global computer chip and supply chain challenges. It isn't stopping us, merely giving us the opportunity to be more creative and deviate from the comfortable. In fact, at its core that's what Neurable is all about. We swerve from the beaten path, confident in the science with unabashed passion for neuroscience.

Our [Discord channel](#) is teeming with ideas, opportunity and collaboration. If you haven't checked it out, you're missing out. Join it and become a part of the bigger conversation. Also, if you're going to be in the Boston area, let us know. We'd love the chance to show you what we're creating, let you try it out, and give you the opportunity to provide us with feedback on our tech.

Neurable is building a world without limitations and we are sincerely proud to have you with us, partners on the journey. Thank you.

*Ramses*

Dr. Ramses Alcaide  
CEO AND CO-FOUNDER



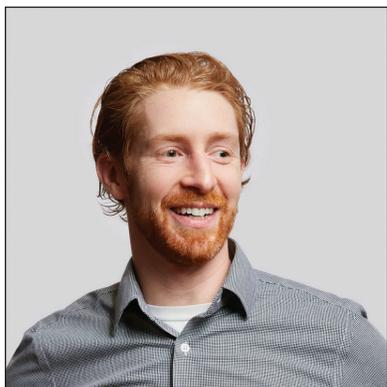
# Our Team



**Dr. Ramses Alcaide**  
CEO, Co-Founder



**Adam Molnar**  
Co-Founder,  
Head of Partnerships



**Jamie Alders**  
VP of Product



**Jegan Candassamy**  
VP of Engineering

## Scientific Advisory Board

**Darin D. Dougherty M.D.**  
Associate Professor of Psychiatry Harvard Medical School

**Dr. David Eagleman**  
Neuroscientist at Stanford University, CEO of Neosensory, and Chief Science Officer of Brain Check

**Dr. John Donoghue**  
Founder of the Brown Institute of Brain Science at Brown University in Providence, Rhode Island

**Dr. Earl Miller**  
Picower Professor of Neuroscience Massachusetts Institute of Technology

**Dr. Jane Huggins**  
Research Scientist at University of Michigan

**Darryl Bradley II**  
Office Manager

**Gustavo Fontana** (Fresco Design)  
Industrial Design

**Ira M. Gostin, MBA, APR**  
Head of Marketing

**Theresa Guarrera**  
UX Design

**Benyamin Meschede-Krasa**  
Software Engineer

**Dr. Walter Piper**  
Research Engineer

**Dr. Mavi Ruiz-Blondet**  
Research Engineer

**Jordan Schultz**  
Hardware Engineer

**Erin Scott**  
Executive Assistant

**Brandon Siebert**  
Software Engineer

**Arjun Srinivas**  
IP Strategy Consultant/Advisor to CEO

**David Stanley**  
Senior Machine Learning Engineer

**Dr. Patrick Stokes**  
Machine Learning Engineer

**Dr. Davide Valeriani**  
Senior Machine Learning Engineer

**Dr. Ali Yousefi**  
Lead Scientist

### 2021 INTERNS:

Nishit Agorval  
Jingyu Cai  
Sarah Cavanagh  
Christopher Keach  
Eashan Reddy Kotha  
Nikhil Kumer

Dana Leichter  
Michelle Lim  
James McIntyre  
Nithin Parthasarathy  
Grant Sheen



# The Future of Neurotech

In the past decade the field of neurotechnology has grown increasingly visible, garnering attention from media outlets ranging from the *New York Times* to *ESPN*. Yet devices that measure brain activity aren't exactly new: electroencephalography (EEG) dates back almost a century. The current explosion of neurotech excitement arises not from the field's newness, but from its growing relevance to everyday life. Liberated from the lab, neurotech now has the potential to affect everything from how we work to how we heal.

In the coming years, we expect a continuation of this trend as consumer neurotech graduates from a gee-whiz novelty to a practical tool. In addition to engineering advancements, the future will bring more cohesive integration of neurotech into existing industries, spanning gaming, VR, wellness and psychiatry. In fact, we can look at innovations already in progress.



## Neurotech + you

The most profound innovations may lie in the addition of neuro-responsive tech to devices we already use. Neurable's Enten headphones, for instance, demonstrate that adding EEG sensors to everyday consumer tech can yield life-enhancing insights into how you work. Likewise, new devices may facilitate insights into more diverse aspects of daily life, wellbeing and the self. Heart rate data from smart watches is currently used for varied applications ranging from health to athletic performance to meditation. Given the relative richness of brain data, the applications are virtually endless and as unique as the users themselves.

## Neurotech + medicine

Aspects of medicine are beginning to migrate from the clinic to our homes via advances in digital health and telemedicine. Today, mental health solutions include apps that deliver talk therapy and EEG devices that aim to treat ADHD through neurofeedback. In the coming years, neurotech will play a bigger role in at-home healing for psychiatric conditions and beyond. For instance, we expect to see growing use of devices to help physicians remotely monitor stroke recovery or treat

“Neurable is committed to furthering this kind of dialogue and developing technology that imparts a positive impact on the world.”



# Awards & Headlines

We made a bit of a splash in 2021 as our work was noticed by a variety of publications. We also collected some award hardware along the way. We share it all with you here:

## AWARDS



Fast Company Next Big Things in Tech 2021



Mass TLC Tech Top 50: Tech To Watch



Dr. David Stanley



Dr. Ramses Alcaide

## HEADLINES

These are just a few of the headlines Neurable made in 2021:

*"Bank of America expects the market to reach \$5.46 billion by 2030 and points to Neuralink, Synchron and Neurable as startups to watch."*

—US NEWS & WORLD REPORT

*"Feeling distracted? These headphones can tell when you're focused — and when you're not."*

—BOSTON GLOBE

*"Fitbit for your brain' headphones aim to boost productivity."*

—BOSTINNO

Plus more:

**CNET Forbes Robb Report Fast Company**

## THE FUTURE OF NEUROTECH CONTINUED FROM PAGE 4

depression via transcranial direct current stimulation.

Additionally, we anticipate continued progress toward the use of invasive neurotechnology to treat conditions ranging from depression and OCD to Alzheimer's and paralysis. These goals will likely take decades to achieve, but the current momentum in this area is noteworthy.

### Neurotech + the metaverse

Over the past two years, our interactions became increasingly virtual as work and play moved online. Forecasters predict this trend will continue, with VR technology and avatar-based programs (i.e., the metaverse) becoming important to our professional and personal lives. We envision a powerful role for neurotechnology in this space. Neurable has already created "The World's First

Brain-Controlled VR Game." As we continue developing our tech, we will incorporate it further into AR, VR and other cutting-edge applications.

These are just some examples of the neurotech industry ramping up. Soon, devices will begin to reach users beyond techies and neuro-enthusiasts. Applications for the technology will grow more diverse and effective. As the field evolves, we also expect to see louder conversations about data privacy and the social implications of everyday neurotech — conversations vital for ensuring ethical maturation of the field. Neurable is committed to furthering this kind of dialogue and developing technology that imparts a positive impact on the world.

This is just the beginning.

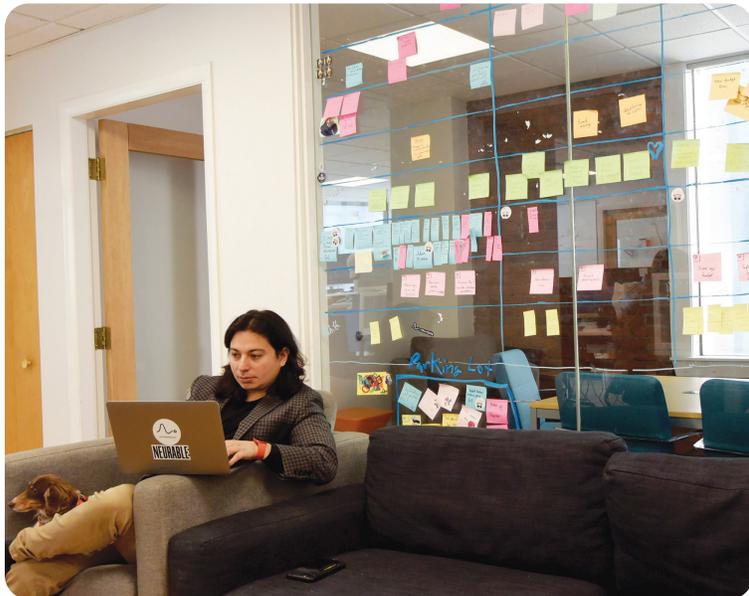


# Updates from the Workbench

As we head into 2022, the engineering and product teams have been busy with hardware and software development, preparing to ship Enten to our first customers. Here are just a handful of the projects they have been working on:

- Developed the earcup sensors, specially-designed for conductivity with the wearer's skin, allowing Enten to reliably measure brain waves
- Updated processing chips with new code for data processing
- Upgraded our focus algorithm with an improved signal processing pipeline
- Integrated our Focus API with the Nanoleaf to show focus levels in real-time and enabling future integrations with any IoT device
- Partnering with Air Force Research Labs to run experiments using Neuroable devices
- Continued testing for audio quality, UX interface, and performance

Fabric sensor prototypes using production-ready kitting processes.



“Neurable has succeeded in building an everyday Brain-Computer Interface.”

—DR. DAVID EAGLEMAN  
Neuroscientist, Entrepreneur  
Professor, Stanford University



# Get to Know Team Neurable

We're focused on bringing technology from the lab into the real world, so neurotechnology is simple and accessible enough to use in your everyday life.

The Neurable team is innovating mathematics, materials science, neuroscience, psychology and more. It's all hands on deck to bring this vision to life — to create the everyday BCI.

## DAVIDE



"In the future, Neurable technology will help you optimize your workday agenda, identifying periods when you are most likely to focus and automatically blocking out external distractions to keep you in the zone."

"It will help people with severe disabilities communicate with

their caregivers by enabling novel forms of interaction using external devices. Neurable technology will help you train your brain to maximize your mental health. With our technology, you can know when you should take a break to avoid burnout, or if your brain can go that extra mile to complete a certain task."

## JEGAN



"BCI is hard and building the right hardware and software for BCI is harder, but getting the right team together to build it is hardest. Neurable has solved the hardest problem, so the rest of the challenges look so easy."

## ADAM



"Commercializing emerging technology is difficult, but the potential for impact is tremendous. It's what helps shoot me out of bed every morning, knowing that we're building something that can really make a difference."

"It's not often that teams truly click. We do. We're weird. We know how to work our butts off but also keep ourselves sane, happy and healthy in the process."



**Dr. Davide Valeriani, left, senior machine learning engineer and Dr. Walter Piper, research engineer, confer on a project in the Boston office.**

## RAMSES



"Our significant technological lead allows us to focus on making BCI technology seamless to use instead of worrying about signal quality."

"The Neurable team is a diverse team from the best institutions in the world and with an expansive variety of experiences, research and practical knowledge. Most impressively though, they have incredible hearts and are so very passionate about what we do."

## MAVI



"Just like heartbeat signals left the hospitals a few years ago and now so many people read their heartbeat on their wrists, getting actionable data, now is the time for the brain waves to leave the labs and hospitals and provide people with a better understanding of their own minds."





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