

HAND at UCLA

2021-2022 Recap & Banquet!



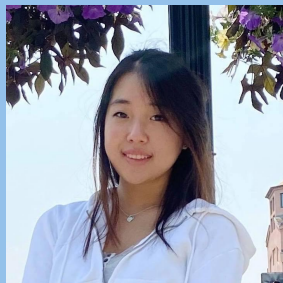
2021-2022 Leadership Team



Tiffany Chen
President



Saumya Tawakley
VP of Operations



Ashley Kim
VP of Outreach



Aarti Jain
VP of Education



Pauline Young
VP of Shadowing



Sravya Sankar
Shadowing Director



Jane Burgan
IT Director



Alex Wu
IT Director



Daniel Hong
IT Director



Nitin Subramanian
Webmaster

2021-2022 Leadership Team



Clara Kennedy
Education Director



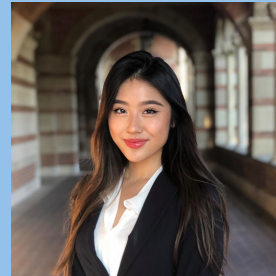
Sasha Anand
Education Director



Ellen Tahmasyan
Outreach Director



Max Orr
Marketing &
Recruitment Director



Crystal Zhou
Social Director

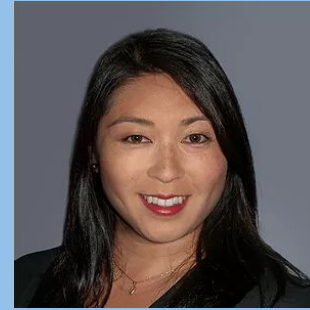
Board of Advisors



Dr. Marlius Castillo
Faculty Advisor



Lee Felsenstein
Engineering Advisor



Dr. Jacqueline Chen
Medical Advisor



Dr. Jeff Bronstein
Medical Advisor



Dr. Ana Luisa Trejos
Engineering Advisor



Dr. Martin McKeown
Medical Advisor





DAILY BRUIN



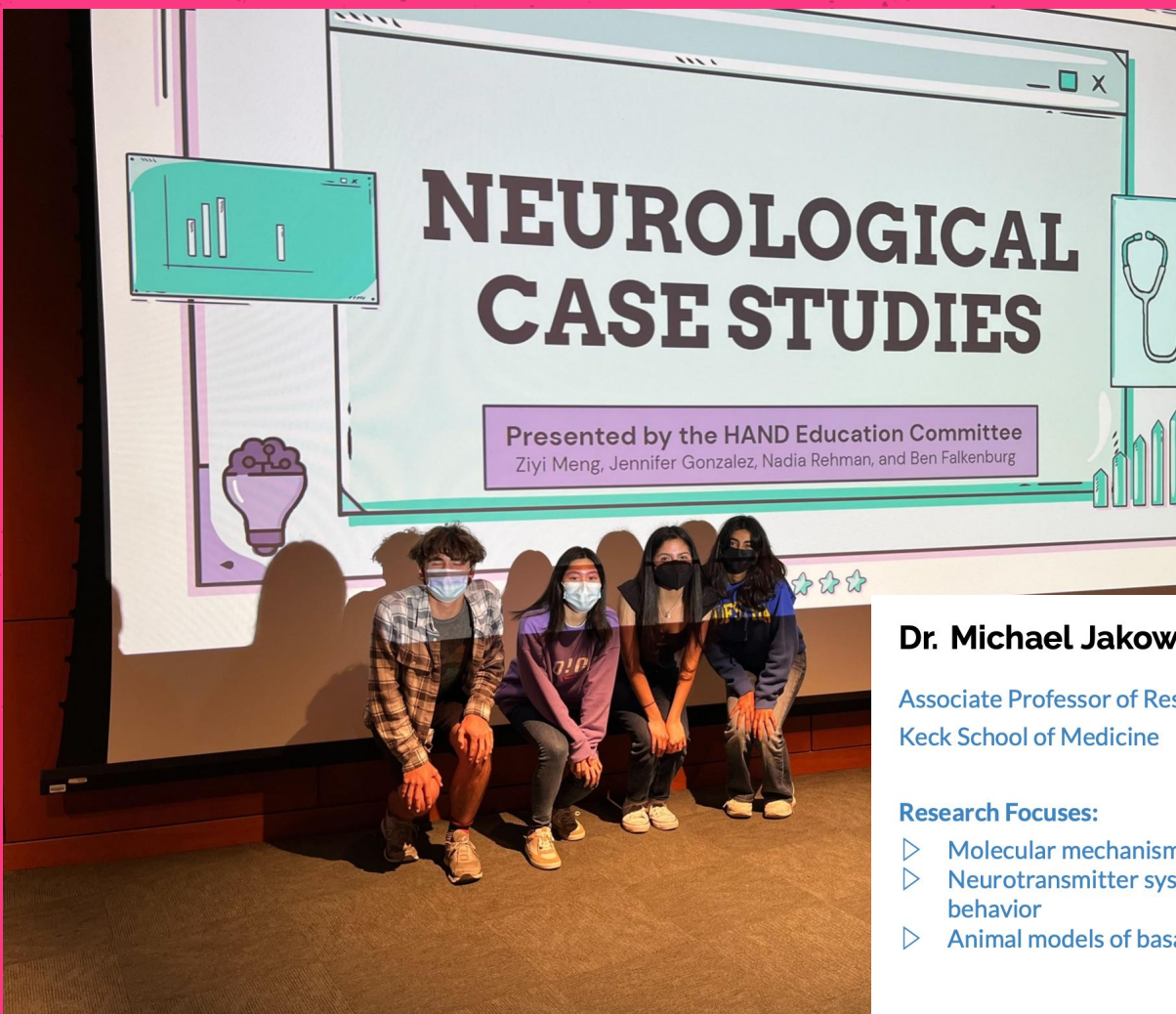
A CLOSER LOOK, NEWS, SCIENCE & HEALTH

UCLA club lends a hand to address neurological diseases via innovation, awareness



Members of the High-tech and Neurological Disorders club stand in front of the UCLA MakerSpace. The student organization started in fall 2020 and works to educate the community about neurological diseases. (Chelsea Westman/Daily Bruin staff)





Dr. Michael Jakowec (PhD)

Associate Professor of Research Neurology,
Keck School of Medicine

Research Focuses:

- ▷ Molecular mechanisms in neuroplasticity
- ▷ Neurotransmitter systems involved in motor behavior
- ▷ Animal models of basal ganglia injury



Neurodiversity in Healthcare

WEEK 5 GENERAL MEETING



X



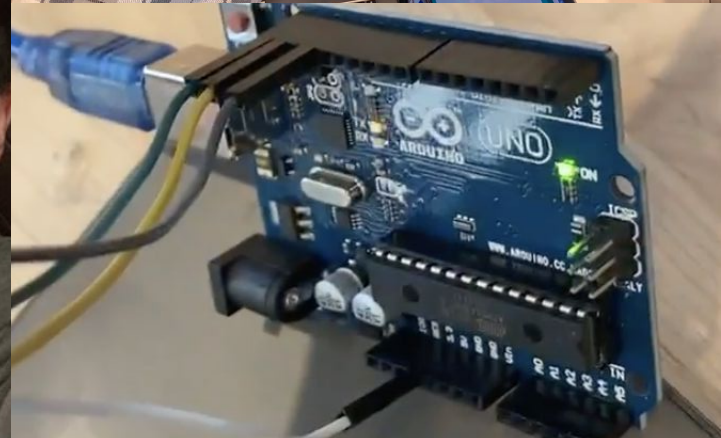
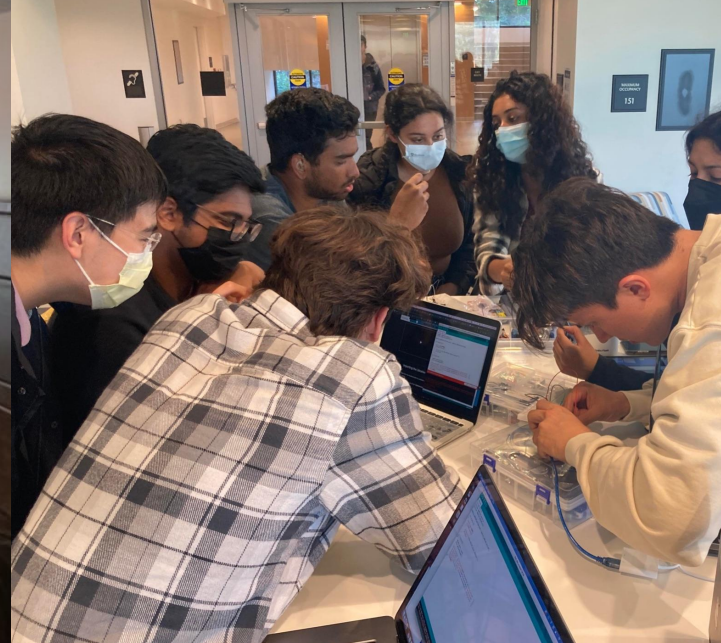
Neurological Disorders: What Are They?

@AIMATUCLA and @HANDUCLA

@aimatuclo X @handuclo

Neurodivergence in College







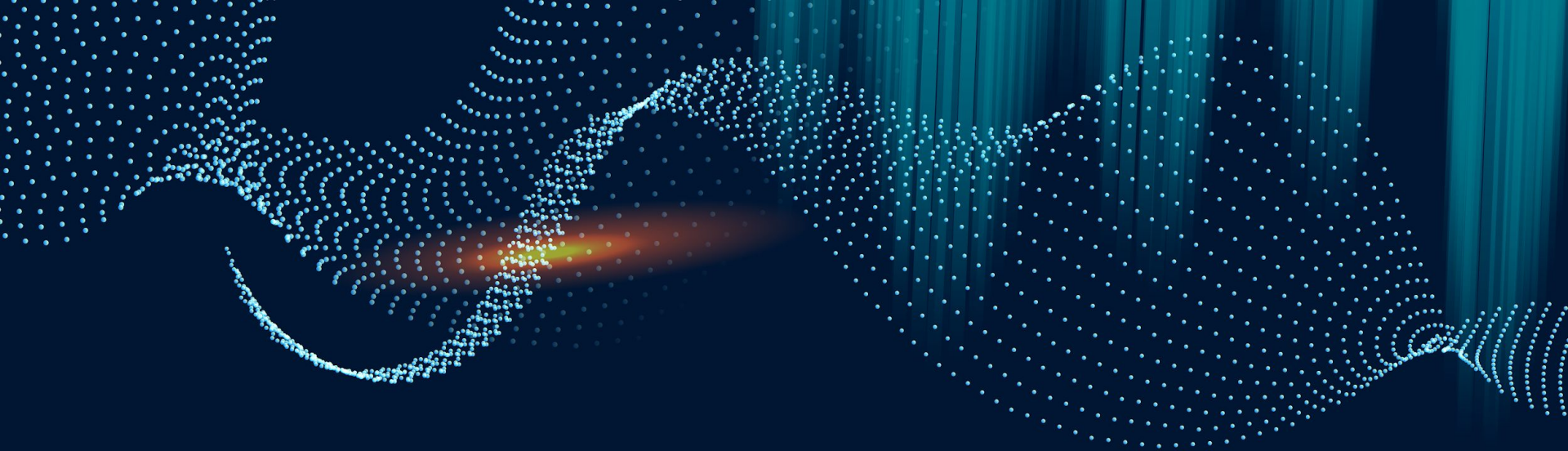
The background is a dark blue gradient. It features two large, abstract, particle-like patterns on the left and right sides, composed of many small white dots. These patterns are illuminated by bright orange and yellow light streaks that sweep across the frame from the top corners, creating a sense of dynamic energy and movement.

EDUCATION

SPRING QUARTER RECAP

The background is a dark blue gradient. It features two large, curved, particle-like trails on the left and right sides, composed of many small white dots. These trails are illuminated by bright orange and yellow light sources at their outer edges, creating a sense of motion and energy. Diagonal streaks of light in shades of blue and orange cross the background, adding to the dynamic feel.

KAHOOT



01 | PODCASTS

Podcasts

- Recorded, edited, and released podcast episode 9
 - Spoke with Judy and Travis from Parkinson's Community Los Angeles (PCLA) about living with Parkinson's disease

Check it out now if you haven't already!



Podcasts

- Working on the last episode for the year!

Look out for topics such as:

- The brain-gut connection
- The role of the immune system in neurodegenerative diseases
- Brain-machine interfaces
- Potential treatments for Alzheimer's





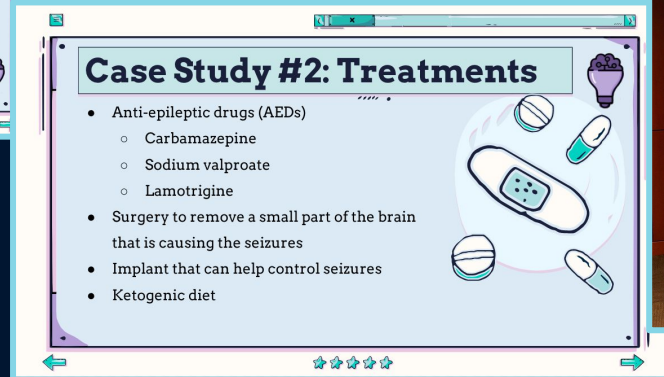
02

**SEMINARS
AND
RESEARCH**

Seminars and Research

- Created an interactive case studies presentation
 - Covered topics such as Multiple Sclerosis, Parkinson's Disease, and Epilepsy!

Our lovely S&R presenters!



Seminars and Research

- Working on a newsletter to close out the school year
 - Will feature Education Committee highlights from the past year!

Preview from Last Year's Recap



H.A.N.D.
HIGH-TECH AND NEUROLOGICAL DISORDERS
SPRING 2021 QUARTER RECAP

HAND AT UCLA

Educating, Empowering, Promoting, Innovating

This Spring quarter, our team:

- Heard from brilliant **speakers** Dr. Margenshtern & Dr. Toker
- Analyzed and discussed **research** on Neurological disorders
- Prepared for **podcasts** with leaders in science
- Created educational **Instagram** stories, blogs, and infographics
- Developed **curriculum** to increase scientific literacy and promote science exploration to young students
- Examined the **iStopShaking** patent and Parkinson's research in preparation for prototype development



Education

SEMINAR & RESEARCH
Hosting prepare for guest speakers and leading thoughtful seminars.

Hosted guest speakers throughout the quarter to speak about ADHD and autism. Presented on several policy and neuro-ethics case studies and research.

PODCASTS
Focused on highlighting development in neurological studies.

Completed three new podcasts on topics such as clinical research, high-tech solutions, and the brain and beyond. Don't forget to check us out on Spotify at the HAND podcast.

SOCIAL MEDIA & NEWSLETTERS
Divide and Conquer! Everyone split up responsibilities to ensure everything was completed.

Created infographics for brain cancer awareness month, mental health awareness month, and ALS awareness month. Produced informative Instagram stories with additional supplemental information on the topic of the week or fun quizzes to test your knowledge.



Let's Talk Movement Disorders

SOME HIGHLIGHTS:

DESIGN AND MATERIALS
To create an accessible and affordable device.

- Gyroscopes and accelerometers, in addition to other mechanisms to counter tremors related to PD and ET
- Materials: thin optical fibers, synthetic fabrics, graphene, and steel disk weights

PHYSICAL MECHANISMS
Ways to make the device even more effective and reliable.

- Tuned mass damper
- Transcutaneous electrical nerve stimulation and electrodes
- Non-Newtonian fluids
- Cooling mechanisms
- Pneumatic tubes and magnetohydrological fluids

USER INTERFACE/UX
To make the device friendly to use and easy-to-use.

- Accessible and simple data portability, using voice AI and customizable interface
- Music therapy add-ons
- Improving access among developing countries/communities

Applications for IT on website!

Applications Coming 9/21

An abstract graphic on the left side of the slide. It features a dense trail of small white dots that curve from the bottom left towards the top right. Overlaid on this trail are several bright, horizontal streaks of light in shades of orange, yellow, and cyan, creating a sense of motion and energy.

**Other
Projects!**

HAND Book

- Collaborative Education Committee Project
- Provides insight into critical neurological terminology
 - Ex. Neurons, Action Potential, Alzheimer's Disease
- Currently scripting sections
 - Stay tuned for the release!

Section 1: Basics of Neuroscience and Neuroanatomy and Imaging Technology:

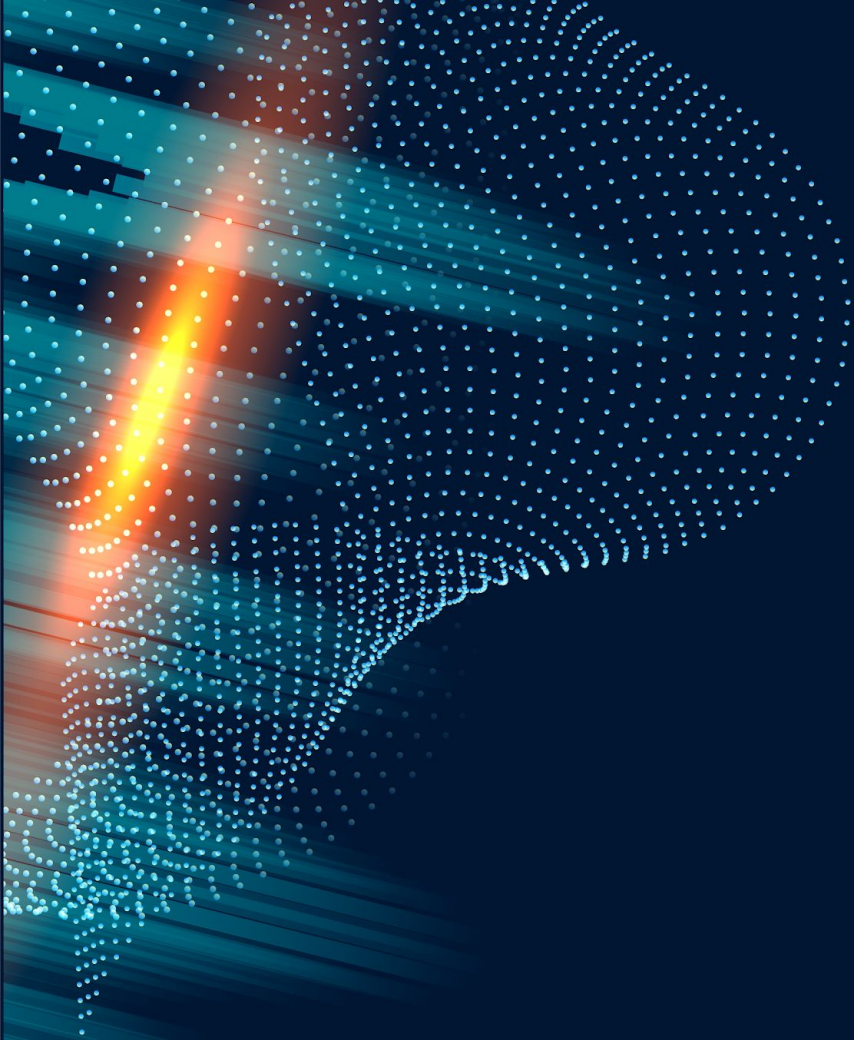
[Section 1 Research Document](#) || [Section 1 Written Section](#)

- Vocabulary - done
 - Neuron, Synapse, Action Potential
 - Neurotransmitter
 - Dopamine
 - Serotonin
 - Acetylcholine
 - GABA
 - Glutamate
- Neurodegenerative Disorders
 - *Section 2: Neurological/neurodegenerative Disorders:*
[Section 2 Research Document](#) || [Section 2 Written Section](#)
 - Overview
 - Biology
 - Onset
 - Symptoms
 - Diagnostic tests
 - Prognosis (timeline, progression of disease)
 - Brief summary of treatments used (mostly covered by section 3)
 - What they are (not the mechanics, how they work)

Section 3: Tech Solutions + Treatment:

[Section 3 Research Document](#) || [Section 3 Written Section](#)

- Types of Treatments Used (basic overview)
 - [Pharmacological treatments](#), electrode stimulation, rehab
 - Which treatments are used
 - i.e. DBS, tCDS, carbidopa-levodopa, immunomodulators
 - Mechanisms - how it works specifically for the disease
 - Why specific treatments are used
- [Dementias](#)
 - Alzheimer's - **Shane**
 - Huntington's - **Shruti**
- Movement Disorders
 - Parkinson's - **Nyari**
 - Essential Tremor - **Francheska**
- Multiple sclerosis - **Rita**



Socials!

**THIS QUARTER,
EDUCATION HOSTED 2
SOCIALS.**

**WE HAVE PHOTO
RECORDS OF NEITHER.
(but there was a lot of pizza
involved)**



So here's a pic of our social from Fall
quarter instead!



Outreach Committee 2021-2022 Recap





Our Goals

01

**Community
Outreach**

02

**Brain
Awareness
Week**

03

Collaborations

04

**Increasing
Involvement**





Introduction

This year HAND's Outreach Committee accomplished wonderful feats including numerous collaborations as well as completion of projects to increase awareness within our local and extended community.

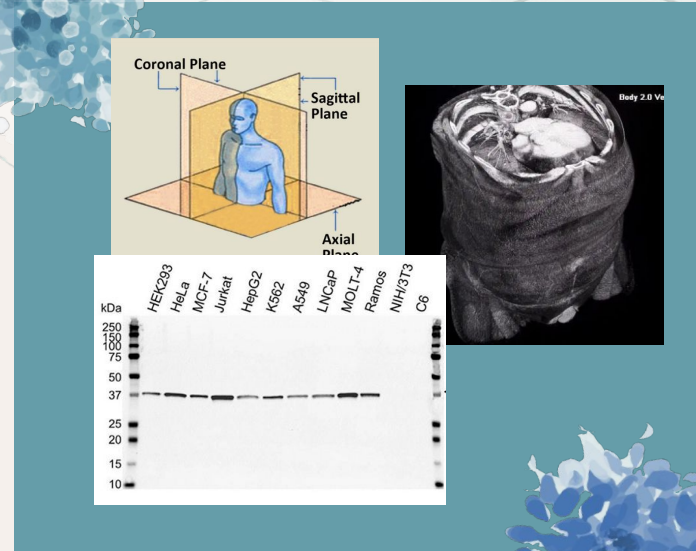


01

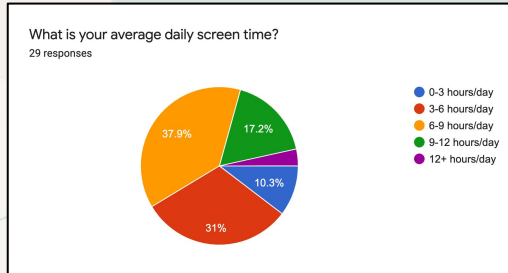
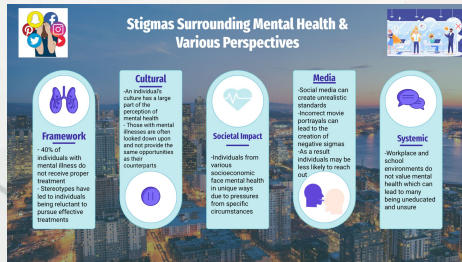
Fall Quarter

Virtual Lab Tours

- ❖ Discussed lab types such as Wet Lab versus Clinical Lab
- ❖ Learned about techniques such as Western Blot & Immunostaining
- ❖ Western Blot - Identify presence and size of target protein in sample - run gel and mark with primary and secondary antibodies
- ❖ Immunostaining - Identify location of protein within cell sample - use antibody conjugated fluorescent tag binds to bind to target protein



Mental Health General Meeting



- ❖ Discussed Mental Health Stigmas
 - Examined anxiety & Depression
- ❖ Conducted a Mental Health Meditation Activity
- ❖ Surveyed members to better understand mental health gaps among college students



02

Winter Quarter

Resume/CV Workshop



Events Team - Outreach Committee

What Should I Include...?

A Personal Introduction
Keep it short but clearly tell the researcher about yourself!

Your interests
Why are you interested in this lab? What specifically draws you to this lab over others?

Your goals
How does this specific lab contribute to your goals in life? How could you contribute to this lab?

Your CV and Cover Letter
Briefly encompass all three aspects above into a clean and professional portrayal of yourself.

Your Transcript
Show your relevant coursework and also your understanding of the material through your transcript.

Relevant Experience/Awards
Be sure to show that you're a great fit for the lab through your previous experiences and achievements.



Formatting Tips

General Formatting Tips:

- 1) 1 PAGE total, single-spaced. Be concise.
- 2) Follow the font type/font size/format of resume
- 3) Put contact info, address etc. at the top of the page as header
 - a) Name should be big/ easy to find
- 4) Have 3-5 short body paragraphs
- 5) Separate paragraphs or sections with an extra line for readability
- 6) Address hiring manager with their name
- 7) Remember to proofread & check spelling!



- ❖ Educated HAND members about resume and cover letter formatting
- ❖ Discussed professional applications

Increasing Community Involvement Presentation

Ways to get involved in our community!

Curriculum Team - Outreach Committee




- ❖ Provided members with insight on other organizations to join such as
 - Step-Up Tutoring
 - Brain Awareness Week
 - UCLA Alumni Mentor Program
 - Hearts over Hands
 - Mentorship Program at UCLA
 - Virtual Shadowing

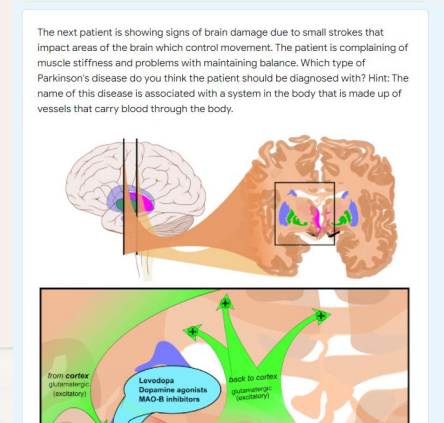
City Lab Collaboration



- ❖ Presented to middle-school level students about the key aspects of neuro-technologies
- ❖ Showcased HAND's iStopShaking Device
- ❖ Hosted a virtual escape room to test student's knowledge and boast collaboration

Neuro-tech devices: Transcranial Direct Current Stimulation (tDCS)

WHAT IS IT?	BENEFITS & DRAWBACKS	tDCS & PARKINSON'S
<ul style="list-style-type: none">- Treatment that uses electrical currents to stimulate parts of the brain.- Noninvasive (patients do not need to undergo surgery to be fitted with the tDCS device)- Stimulation is delivered via electrodes placed on the head.- Changes excitability of neurons	<ul style="list-style-type: none">- Inexpensive, Low-Risk, Portable- Imprecise 	<ul style="list-style-type: none">- Placed in brain areas controlling motor and cognitive function- Cognition: increase PFC excitability- Motor: tDCS increases mobility, balance, etc





03

Spring Quarter

HAND Outreach Curriculum Booklet

- ❖ Members of the Outreach Committee collaborated to create a booklet discussing various Neuroscience topics
- ❖ These ranged from types of neuroscience research, mental health, learning, memory, biotechnology professions, and more
- ❖ We are currently looking into clinics to distribute our booklet to

HAND OUTREACH COMMITTEE

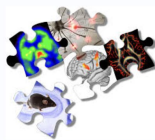
NEURO DISORDERS



A presentation by Henrietta Mitchell

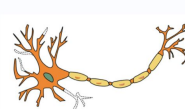
5. Translational and Clinical Neuroscience Research

Works with neurologists, neurosurgeons, and other medical personnel firsthand to develop therapies, as well as depict ways to improve upon clinical neuroscience research as a whole.



Analyzes previous studies and track patient progress as they undergo new therapies as well as improve patient encounters within this field. It also keeps up to date with new technology and methodologies.

Neurons & Message Signaling



What are Neurons?

Neurons are the basic building blocks of the nervous system!

- Specialized to send information throughout the body
- Can communicate through chemical and electrical signals



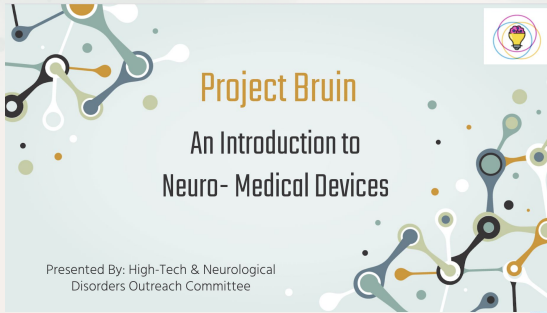
Neuron Structure

- **Dendrites:** receive information from other neurons
- **Cell Body (Soma):** here is where the nucleus is, and where the neuron is maintained and kept functional
- **Axon:** elongated fiber that extends from the cell body to the terminal endings and transmits the neuron's signals to other neurons

Message Signaling

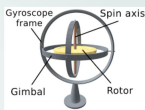
- Neurons use action potentials to communicate with each other
- **Synaptic Communications:** either the electrical impulse itself or chemical communication in the form of a neurotransmitter will bridge the gap between neurons at the synapse
- **Neurotransmitters:** chemical messengers that reach the receptor sites of other neurons
 - Examples of neurotransmitters:
 - Acetylcholine: memory, learning, muscle contraction
 - Endorphins: emotions and pain perception
 - Dopamine: thinking and pleasurable feelings

Project Bruin

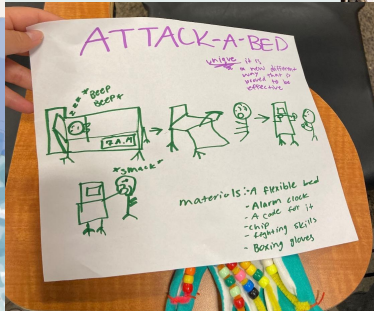


Key Components & Facts About the iStop Shaking Device

- Gyroscopic stabilization
 - Counteract tremor force
 - Main stabilization
 - Accelerometers to detect tremors and spin accordingly
- Non-Newtonian fluid
 - Special type of fluid that can become thicker if manipulated
 - When tremors occur, fluid will thicken and become solid-like
 - Restrict movement
 - Examples: Cornstarch, Oobleck, Ketchup



The diagram shows a 'Gyroscope frame' with a 'Spin axis' and a 'Rotor'. A 'Gimbal' is also indicated. Below the diagram is a small photo of a red Heinz ketchup bottle.



- ❖ Presented to students from K-12 about Neuro-medical Devices
- ❖ Students created their own model of the iStopShaking Device
- ❖ Students also worked in teams for a Shark-Tank activity to pitch a creative product



Interaxon Collab

Neurodegenerative Diseases & Neuro-Technology

Presented By: High-Tech & Neurological Disorders Outreach Committee & Innovation Team

Impact of Neurodegenerative Diseases

Neurodegeneration quickly
Loss and death of neurons and function in the brain



Cells shrink in substantia nigra

→ Parkinson's causes a lot of executive functions and dopamine

Hippocampus shrinks

→ Alzheimer's causes memory loss and deterioration in thinking

iStopShaking Device

The iStopShaking Device is a mechanical glove that aims to reduce the tremors that are a result of Parkinson's Disease. We hope to accomplish this by using mini-gyroscopes and accelerometers as a way to mechanistically minimize tremors while also using sensors as a way to track our patients and their outcomes.



- ❖ Will present to students this coming Saturday about Neurodegenerative Diseases and Neuro-Technology
- ❖ Students will get the chance to participate in hands-on activities such as modeling a neuron

Goals For Next Year

More Collabs!



**Creating additional
community
resources**

**Successful Distribution of
Our Outreach Booklet**



**Teaming up with
Local Clinics**



THANK YOU!

Cheers to exciting new things to come!

PR/M&R YEAR RECAP

F21 - S22



PR/M&R's ACCOMPLISHMENT OVERVIEW



01

F21 & S22 Recruitment

Two recruitment cycles led
- over 60 new members +
new board members!

02

Graphic Design

Countless designs for GM
& committee recaps,
fundraisers, spotlights,
podcasts

03


Fundraising

Organized and led
multiple fundraisers

04

HAND x AIM

Expanding our
knowledge of
neurodivergence



01. RECRUITMENT

- **F21 Cycle**
 - 21 members recruited
- **S22 Cycle**
 - Flyering!
 - 40 members recruited
 - 8 new board members!

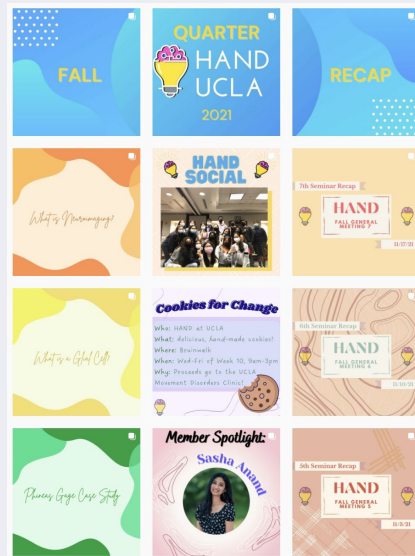
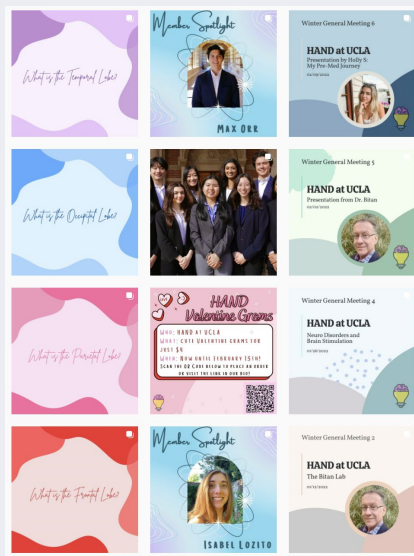




NEW PR/M&R DIRECTORS

ISABEL LOZITO
&
ALLISON PENG

02. GRAPHICS



03. FUNDRAISING

3 total fundraisers

- Cookies for Change
- HAND Valentine Grams
- Pie a HAND member/Cookies
 - This Thursday & Friday (1-5pm)



04. HAND x AIM Collaboration

Neurological Disorders: What are They?

Neurological Disorders: What Are They?

@AIMATUCLA and @HANDUCLA

Neurodivergence in College

@aimatucia X @handucia

Neurodivergence in College

Social Stigmas and Stereotypes



Social Stigma and Stereotypes Faced by Neurodivergent People

@aimatucia X @handucia

→ **Disclaimer:** These are by no means the only neurodivergencies that face the effects of stereotypes and stigmas. However, these are some common examples that we thought we'd bring up to encourage further discussion.



THANK YOU
PR TEAM



2021-2022 HAND Innovation Team ReCap

Directors: Jane | Daniel | Alex | Max | Anu

Goals!

Data Analysis

- ❖ Output data from an accelerometer in 3 directions
 - Isolate each direction, store the data, and have a standard of comparison for future patient-related measurements

Data Output

- ❖ Create a custom gyroscope that produces some force in 1 direction

Challenges

Data Analysis

- ❖ Setting up a raspberry pi without a desktop monitor & reliable wifi connection
- ❖ Becoming familiar with the materials bought from last year

Data Output

- ❖ Brushless motors bought when we needed non-brushless motors
- ❖ General supply chain & material problems

Data Analysis Achievements

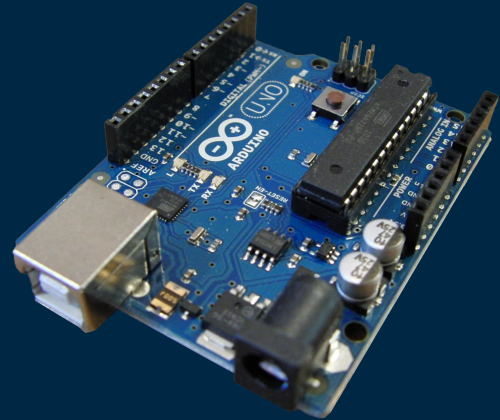
For raspberrypi:

- Headless set up using hotspot
- Raspberrypi workspace



For arduino:

- Set up a successful arduino-accelerometer connection that measures data & outputs to live-graph
- Set up a github repository for the coding we will be doing
- SSH & write data into SD card for storage
- Familiarized ourselves w/ materials (how accelerometer outputs data, how raspberry pi & arduinos connect, etc)



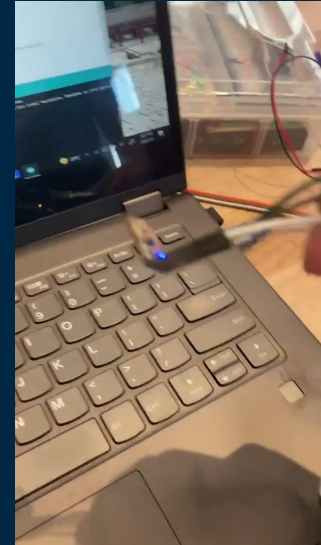
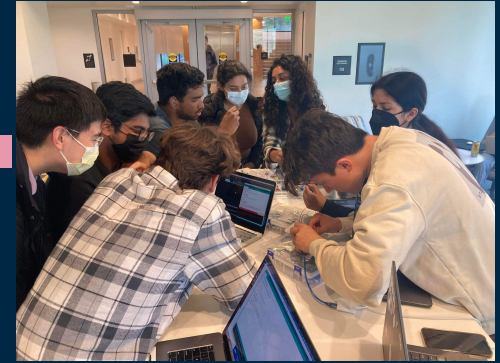
Data Analysis Process

Clear & Open Communication

- Improved communication within directors & team members at the beginning of spring quarter
- Had a conversation with members on expectations
 - Will continue these open discussions at the beginning & end of each quarter to set meeting guidelines and structure

Teamwork & Collaboration

- Working in-person w/ small number of individuals per device → more hands-on for everyone
- Social!



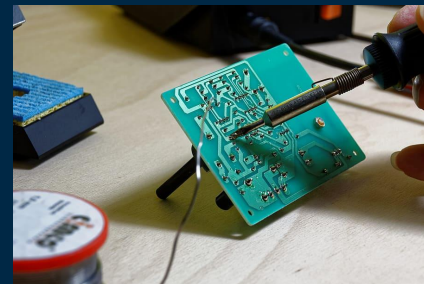
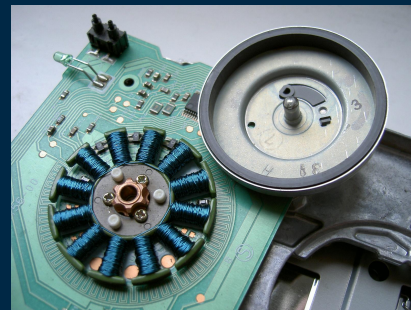
Data Output Achievements

Finalized Brushless Motors

- Finalized the motors that we would utilize for our gyroscopes

Sourced Supplementary Material

- Ordered motherboards and other hardware needed to run the motors via proprietary software
- Began to work on skills for hardware functionality and design
 - 3D modeling using Fusion 360
 - Soldering skills through the Makerspace



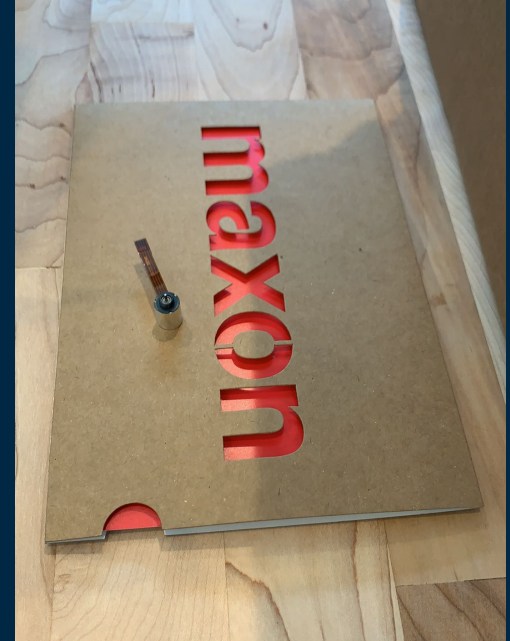
Data Output Process


Trial and Error

- Due to hardware compatibility issues, we had to order and reorder many parts after testing for compatibility
- Many of our initial ideas had to be varied

Flexibility and Collaboration

- Due to scheduling constraints of our team, we worked together alongside members and directors to finalize meeting times that work with everyone
- Aiming to have more cross-collaboration between the IT committees

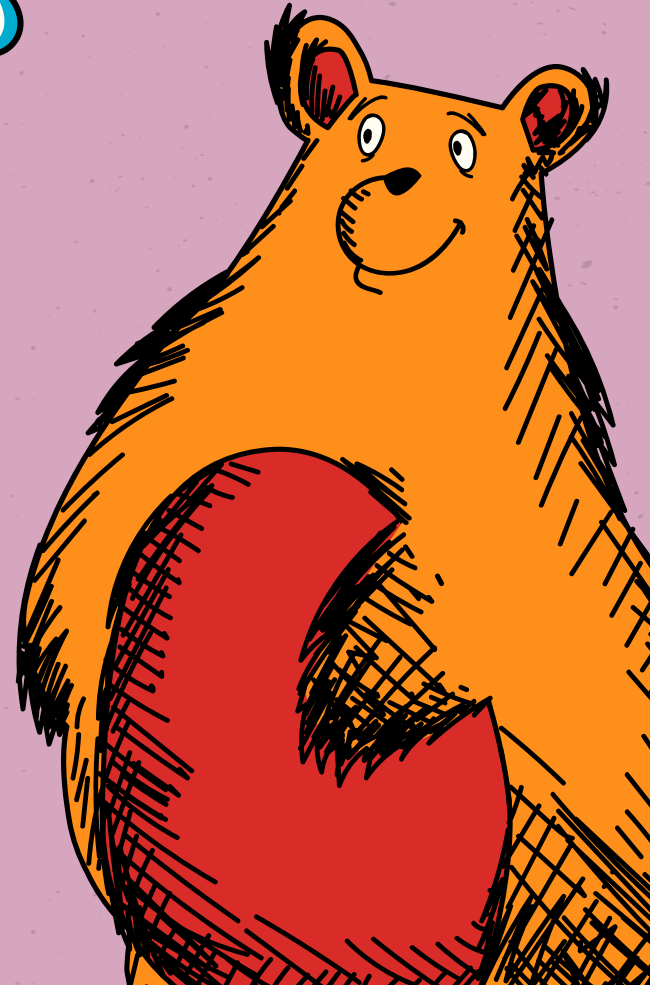


The background is a dark blue gradient. It features several thin, vertical white lines of varying lengths scattered across the frame. Interspersed among these lines are small squares in three colors: light pink, light orange, and light teal. Some squares are solid, while others are outlined. The overall aesthetic is modern and minimalist.

Thank you to our
wonderful members for
making this all happen!

<3

Senior Send-Offs





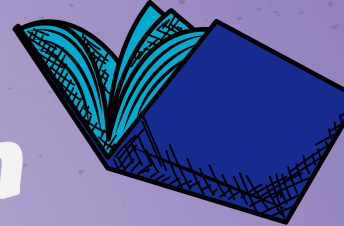
Aarti Jain



- Major: Neuroscience
- Position: Education Director, IVP
- Post-Grad: Medical School at New York Medical College
- Favorite HAND Memory: Socials with the Education Committee!



Jane Burgan



- **Major:** Neuroscience
- **Position:** IT Director
- **Post-Grad:** Medical School at Stony Brook SOM
- **Favorite HAND Memory:** Going to an IT dinner/social and just getting to meet everyone in person after the year of being online
- “I love HAND so much and everyone in it, going to miss everyone :) and can’t wait to see what direction the club makes and what all the members accomplish”



Crystal Zhou



- **Major:** Psychobiology
- **Position:** Social Director
- **Post-Grad:** Medical School
- **Favorite HAND Memory:** Meeting everyone in-person at our first social!
- “Thank you for such a wonderful experience, truly grateful for all the wonderful connections I’ve made here. Wishing the next gen members best of luck - hope to see istopshaking in the market one day soon :)”

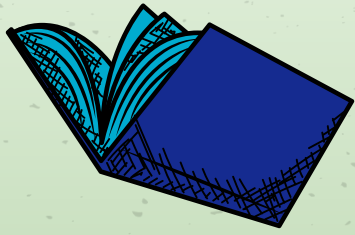




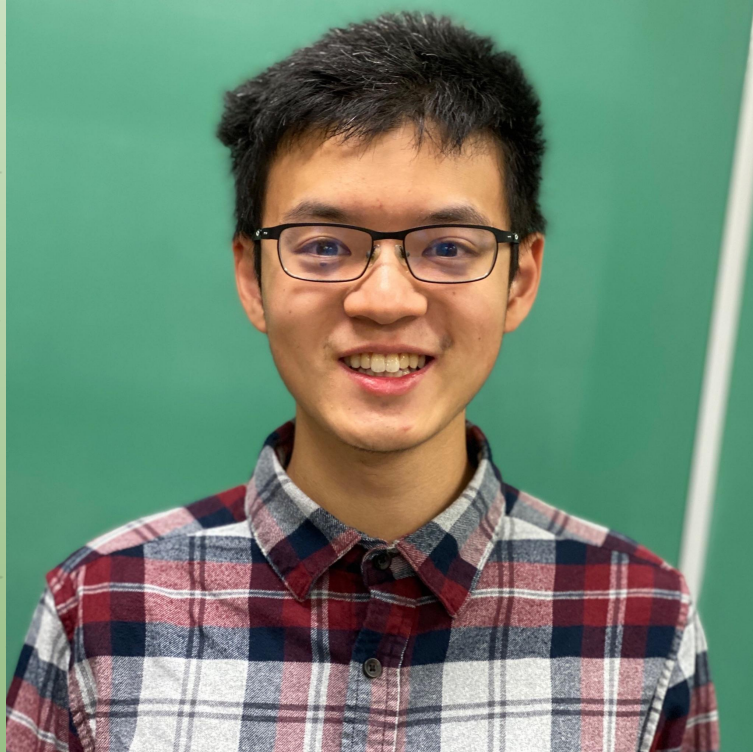
Sravya Sankar



- **Major:** Psychobiology
- **Position:** Shadowing Director
- **Post-Grad:** Gap Year + Medical School
- **Favorite HAND Memory:** Presenting to middle and high-school student in the early days of HAND in Outreach Committee! So exciting to see younger students interested in the same things that we are and so engaged in learning!
- “Love HAND and all that I’ve been able to experience and people I’ve been able to meet by being part of it! <3”



Loren Chang



- **Major:** MIMG
- **Position:** Education Podcasts Squad
- **Post-Grad:** 2-year post-bacc fellowship at the NIH; Graduate school for immunology or a similar field
- **Favorite HAND Memory:** Zoom meetings for the podcast squad last year were always entertaining. I also liked the socials; I enjoyed being able to interact with fellow club members outside of meetings.

