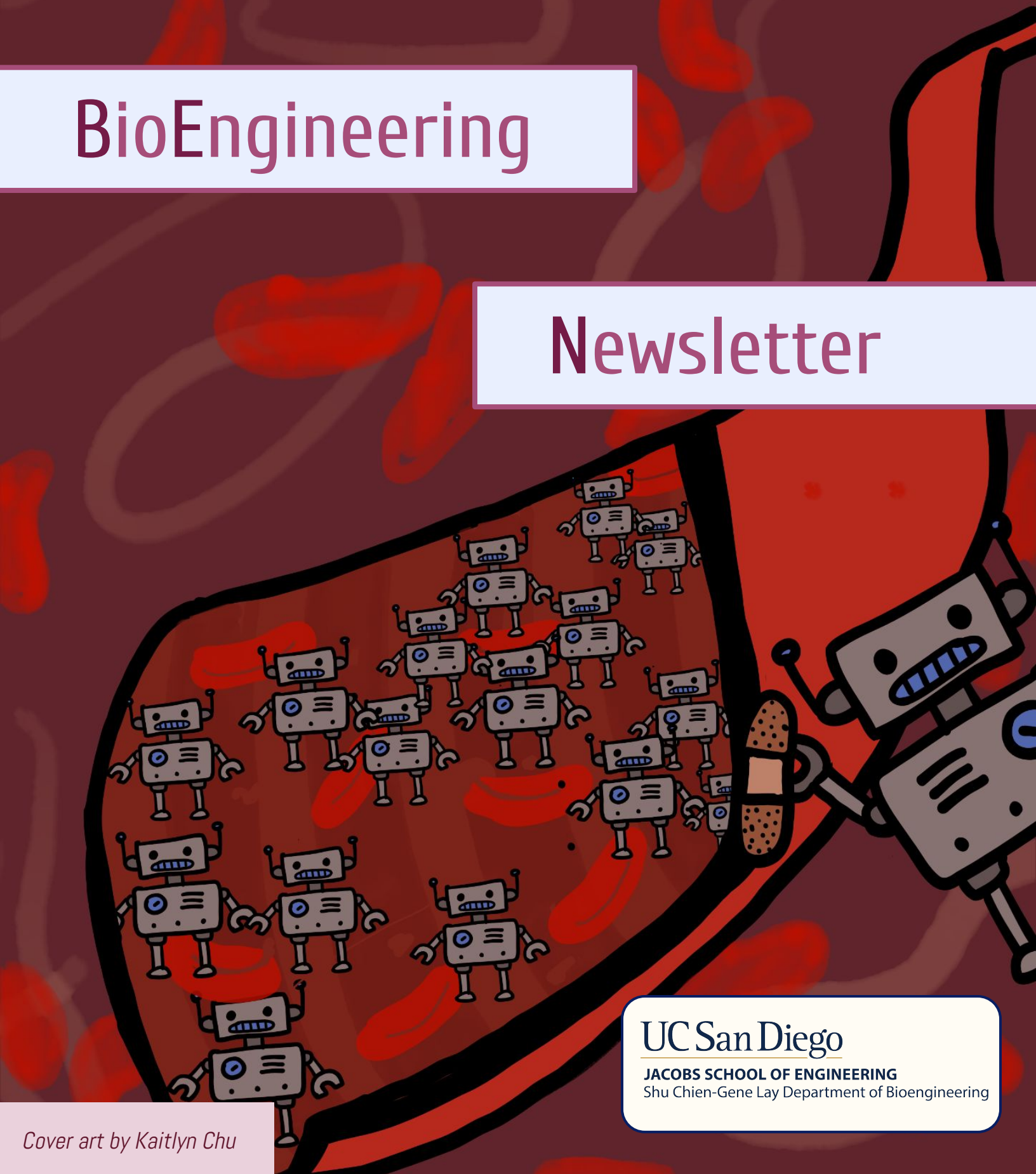
Fall 2022

BEN

BioEngineering Newsletter



UC San Diego
JACOBS SCHOOL OF ENGINEERING
Shu Chien-Gene Lay Department of Bioengineering

Cover art by Kaitlyn Chu

The BioEngineering Newsletter (BEN) is a student run publication that covers the people, research and events within the UCSD Bioengineering community. As always, the **Fall 2022** issue is dedicated to celebrating the resilience and ingenuity of our peers.

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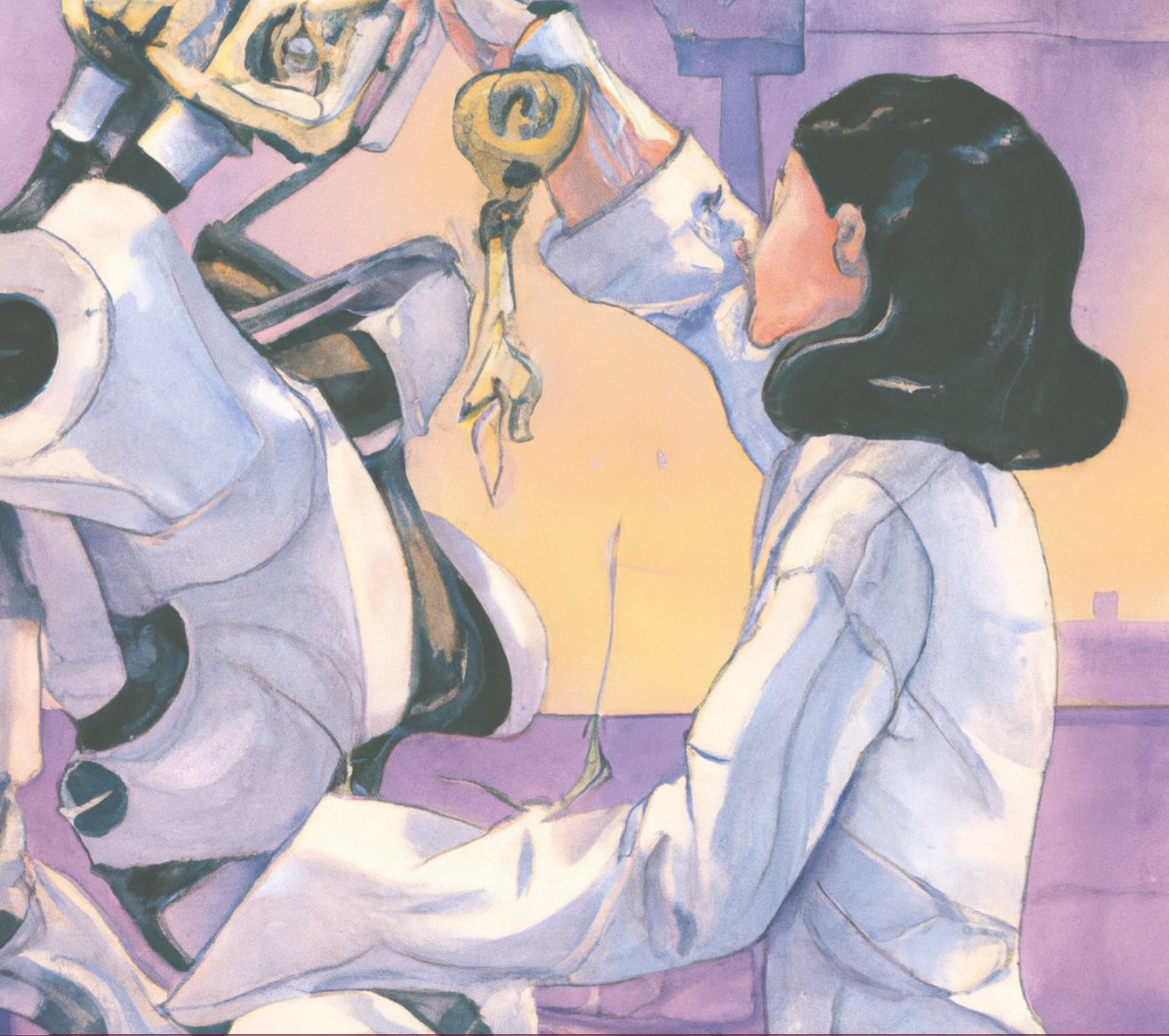
Features

Nanorobots battle with cancer cells

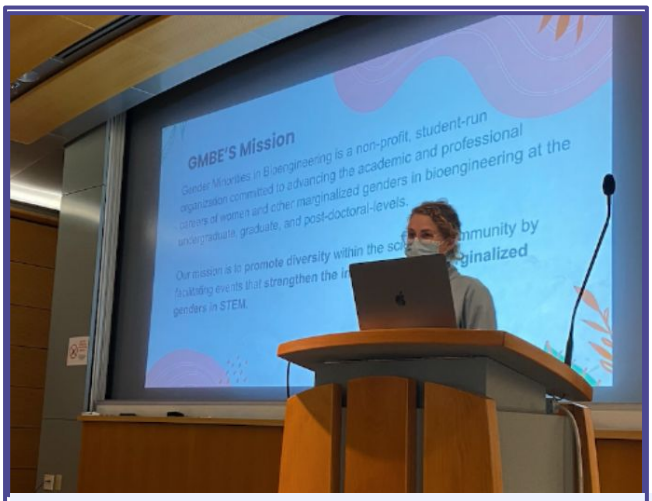


In the Fall 2022 newsletter, we would like to feature a recently-founded org, **Gender Minorities in Bioengineering.** Visit their website at *gmbe.ucsd.edu* to learn more

Building surgical robots

Gender Minorities in Bioengineering

By Shanessa Siddique | GMBE Representative

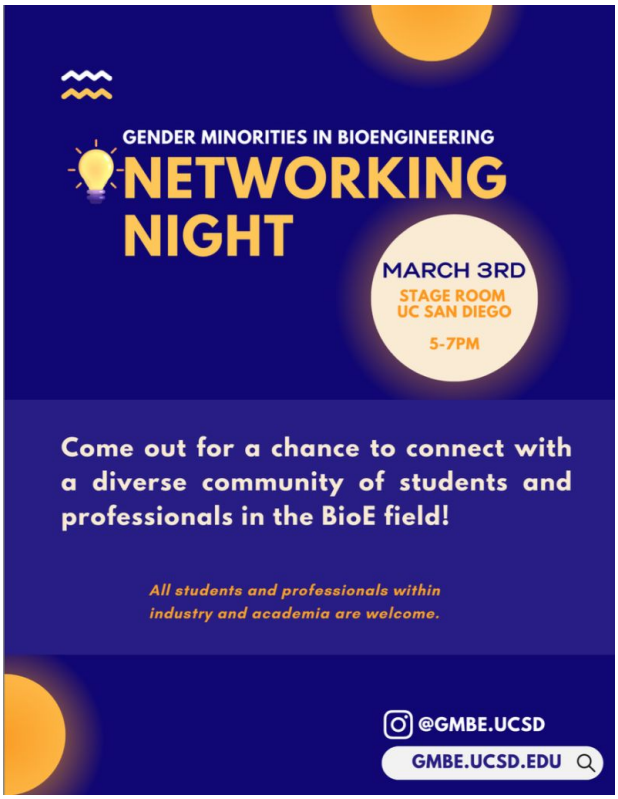


GMBE Graduate Student President, Erin LaMontagne

Gender Minorities in Bioengineering is a non-profit, student-run organization committed to advancing the academic and professional careers of women and other marginalized genders in bioengineering at the undergraduate, graduate, and post-doctoral-levels. We generate opportunities to best serve the interests of our members and the broader community so that we can shape a more diverse future. Our mission is to promote diversity within the scientific community by facilitating events that strengthen the involvement of marginalized genders in STEM.

Mentorship

To harbor meaningful and educational relationships between UCSD bioengineering affiliates. Events aim to provide academic and career path guidance from faculty, post-docs, and graduate students towards their respective juniors.



Outreach

To spark STEM interest in the youth and share STEM passions beyond the scientific community. Events aim to work with people outside of UCSD to educate the public on bioengineering concepts, research, and careers. We're always looking for volunteers to help out at our events - most events are only 1-2 hours long; reach out to us if you are interested!

Fall Events included:

1. *Girl Scouts Workshop I: Strawberry DNA Extraction;* goal to teach attendees about DNA structure and lead them in a hands-on DNA extraction activity using household supplies
2. *Girl Scouts Workshop II: Model Prosthetic Arm*

Goal to teach attendees about the importance of prosthetics **(talk by Dr. Aadeel Akhtar of PSYONIC)** and lead them in a hands-on activity to build a model prosthetic arm using household supplies

- *Winter Quarter plans:* Girl Scouts Workshop III (Coding bootcamp), San Diego middle school visits, Fleet Science Center partnership
- *Spring Quarter plans:* Girl Scouts Lab Tours, SD middle school visits, Fleet Science Center partnership

GMBE X SWE Beach Day

Professional Development

To prepare for careers beyond UCSD and build professional networks. Events aim to teach GMBE members skills that will aid in professional settings and better guide their academic choices.

Winter and Spring Quarter plans:

1. *Marketing Yourself as a Bioengineer:* workshop on how to discuss your skills as a bioengineer in small settings for both grads and undergrads

Girl Scouts Prosthetic Arm Building Workshop

2. *Networking Night Mentorship Program:* Goal to pair undergrads and grads who attended GMBE's Networking Night with industry and faculty mentors to enrich their knowledge and interests in bioengineering **(March - June)**

Moving forward, Professional Development is looking to add to our database of industry and faculty professionals so that we can provide our members with greater opportunities and connections.

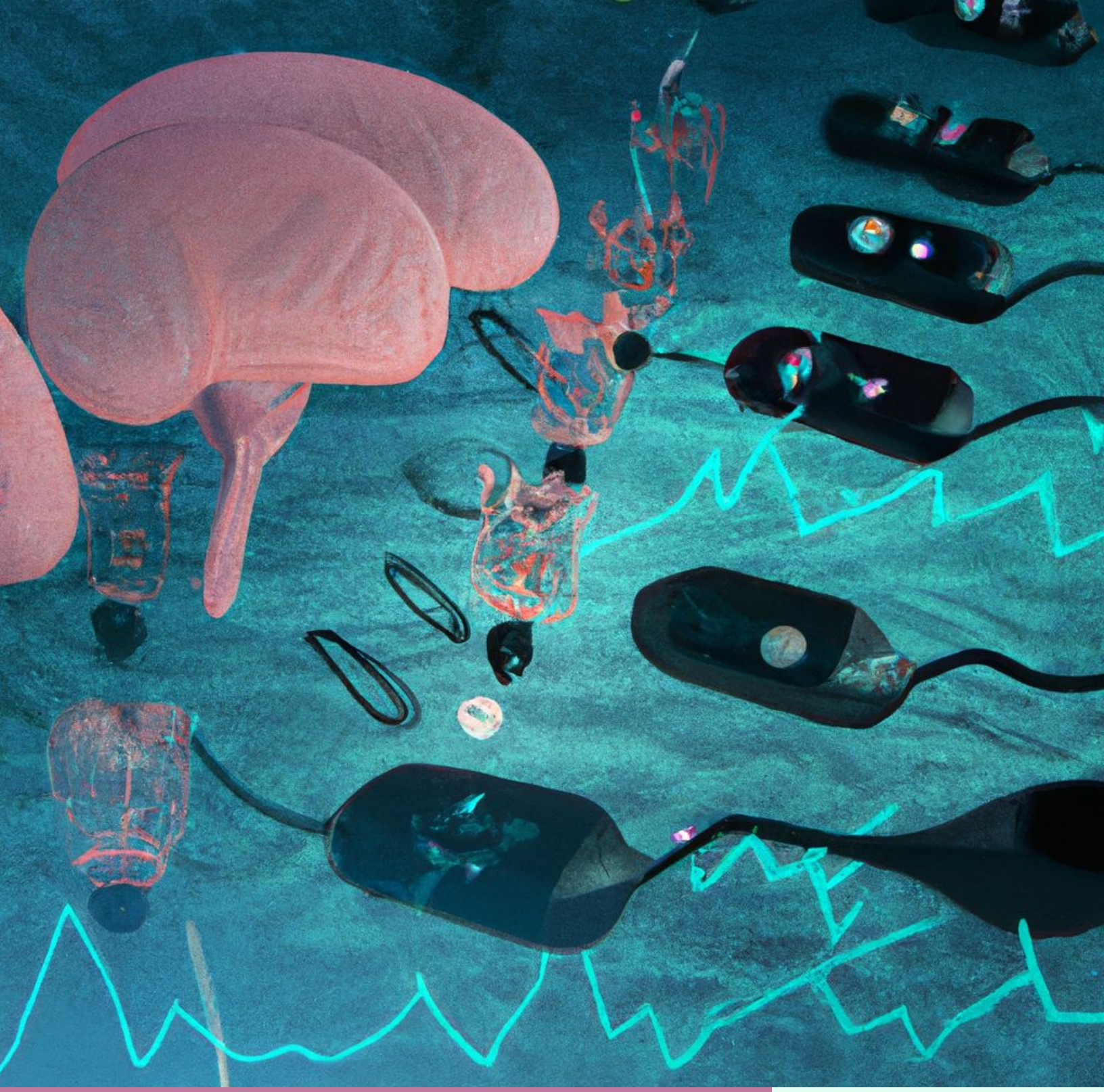
Social & Collaboration

To cultivate connections between GMBE members and reach out to other organizations at UCSD. Events aim to provide GMBE members with opportunities to build friendships while doing fun and social activities. Create a safe space for gender minorities within Bioengineering to be exposed to academic, career, and social opportunities

Fall Events included:

1. GMBE x SWE Beach Day:
   Goal to encourage students from SWE and GMBE to interact, build connections, relationships, and gain greater exposure to different disciplines within Engineering

- ***Winter Quarter plans:*** Hike (one of our main events), Game Night (postponed from Fall quarter), potential study session
- ***Spring Quarter plans:*** picnic, possible beach day again, brunch outing



Student Org Events

Nanosensors measuring brain waves

BEGS Science Outreach

Enriching the Engineers of Tomorrow

By Kristina Chan
BEGS Representative,
Bioe PhD student

L to R: BEGS outreach volunteers: Austin Doughty, Mitchell Kong, Kristina Chan, Chloe Nguyen, Tiffany Zhou

You're at a bioengineering conference with approximately 100 eyes staring at you. They've poured refreshments for the audience, and you begin to explain the controlled, independent, and dependent variables of your experiment: the room starts to buzz with excitement.

The only downside is that everyone is not particularly focused on your presentation, but rather,they're more intrigued by the cups of water on the table. Attention seems to bounce around the room, but you continue on explaining bar graphs with enthusiasm. The next time you're invited back to present, there's a blackout in the room, and flashlights are passed out. You're holding a large light up to your chest. You're spinning in circles... It's like symphonic chaos.

It sounds like a terrifically humbling public speaking experience, but I failed to mention that these 100 eyes belong to 5th graders, the conference is held in the Lafayette Elementary School Cafeteria, and you're part of the Science Outreach Program with **UCSD's Bioengineering Graduate Society (BEGS)**. The two aforementioned "conference presentations" include 1) how to set up an experiment utilizing various cup sizes and volumes of water, and 2) how the position of the sun changes the way shadows are cast throughout the day.

Every week, bioengineering graduate students (myself included) make their way out to elementary schools and high schools to teach science experiments that lead students through scientific thinking. This initiative is part of BEGS (Bioengineering Graduate Society's) Outreach that's aimed at extending awareness of and inspiring involvement in bioengineering and the sciences.

Young students have fun with hands-on activities

The learning that occurs during these outreach events is a two way street. I must say, the parallels between teaching 5th graders and presenting at an academic conference are

uncanny.

If a graduate student can keep the attention of 5th graders while explaining bar graphs, then engaging academics with distilled scientific data suddenly becomes uncomplicated. Just as importantly, the reverse is also true. If 5th graders can begin engaging with scientific concepts in elementary school, then grasping science with ease and also learning how to learn becomes second nature. It's just like speaking a language: would you rather learn a language as a child? Or as an adult? A nourishing immersion into (scientific) language as a child surpasses arduously articulating foreign accents (and scientific hypotheses), painstakingly interpreting new words (and scientific data), or simply trying to keep up your DuoLingo streak (and keep on your science hat).

Schools are museums of thought, and as a community we can sculpt experiences which excite young minds via the art of teaching and learning. At the end of the day, before the school bell rings, BEGS Outreach aspires to enhance the joy of science and support the discoveries these future young scientists will bring.

If you would like to join the initiative, please contact Sarah Hasty, Elementary Education Science Outreach Coordinator, @ *hastysarah@gmail.com*

Biomedical Engineering Society

New Beginnings at BMES

By Ritika Singh | BMES Representative

Mentorship pairs do some hand-painting to create a BMES banner, red for the Fung family, green for the Intaglietta family, and blue for the Zweifach family.

After two academic years of remote lectures, virtual career fairs and Zoom socials, the Biomedical Engineering Society is more excited than ever to have a full year of exciting in-person events. They kicked off the year strong by attending the BMES Annual Meeting in San Antonio, TX this October to receive the **2021-22 Outstanding Achievement Award for the UCSD BMES student chapter, an award they are receiving for the third time in the last five years!** This award is given by the national organization to the top BMES student chapter worldwide, and UCSD BMES received this award to honor their incredible efforts and accomplishments from the 2021-22 academic year.

Fall quarter, UCSD BMES began their annual mentorship program to connect underclassmen with upperclassmen in BEng to build a supportive and inclusive community for students of any major interested in biomedical sciences and engineering. BMES mentors were eager to meet their new mentees at the **Mentorship Reveal event** held this October, where 27 mentor-mentee pairs played fun social games to properly welcome new students to the BMES community. One-on-one mentorship opportunities like these are the best way to get direct advice from upperclassmen about what classes to take, how to find research and industry opportunities, and how to get through college in general. Mentors will carry this academic and emotional support through the rest of the year while they team up with other mentorship pairings in their assigned families (Fung, Intaglietta, Zweifach) to compete with each other through fun games and social events (Bingo, Olympics, etc).

UCSD BMES volunteers at the Light the Night Walk-a-Thon Fundraiser at the Waterfront Park this November.

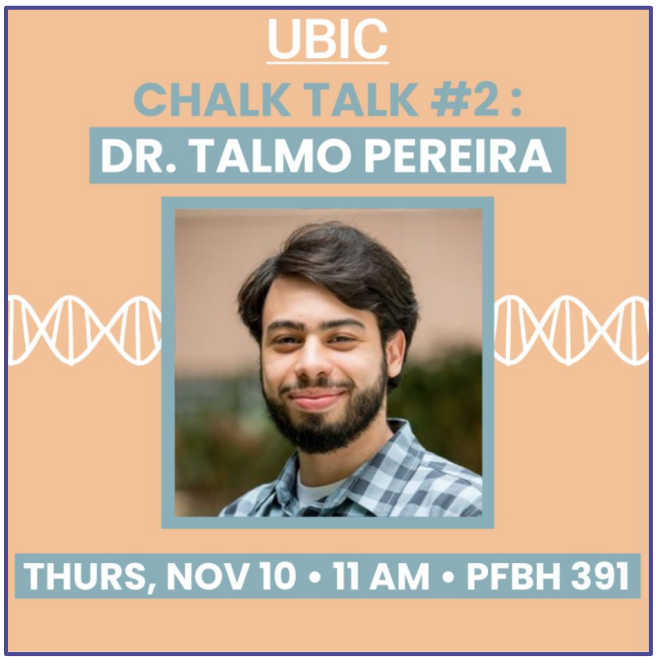
UCSD BMES lit the night up at their first major event of the year, **Light the Night!** This is an annual walk-a-thon fundraiser hosted by the Leukemia and Lymphoma Society, where cancer survivors and supporters carry lanterns of different colors to raise money and awareness towards the research and cures for blood cancers. Led by the Outreach Committee, UCSD BMES and other students had the opportunity to volunteer at this year's in-person event at the San Diego Waterfront Park, where they assembled over 1000 lanterns for the event and helped guide blood cancer supporters and survivors through the walk to ensure the event ran smoothly. UCSD BMES had a blast interacting with the San Diego community and meeting survivors of blood cancers as well as those affected by them. We look forward to our continued participation in this annual event as it is also an extremely emotionally impactful one and hits home for members of our own UCSD BMES community. If you are interested in participating in events like these in the future, you can join the Outreach Committee without being a paid member by meeting in PFBH291 on Tuesdays 6-7 pm.

The current UCSD BMES Officer Board received the 2021-22 Outstanding Achievement Award at the BMES Annual Meeting in San Antonio, TX this October.

UBIC Chalk Talks

Connecting Students to Faculty Research

By Riya Kalra and Alice Zhu | UBIC Freshman Representatives



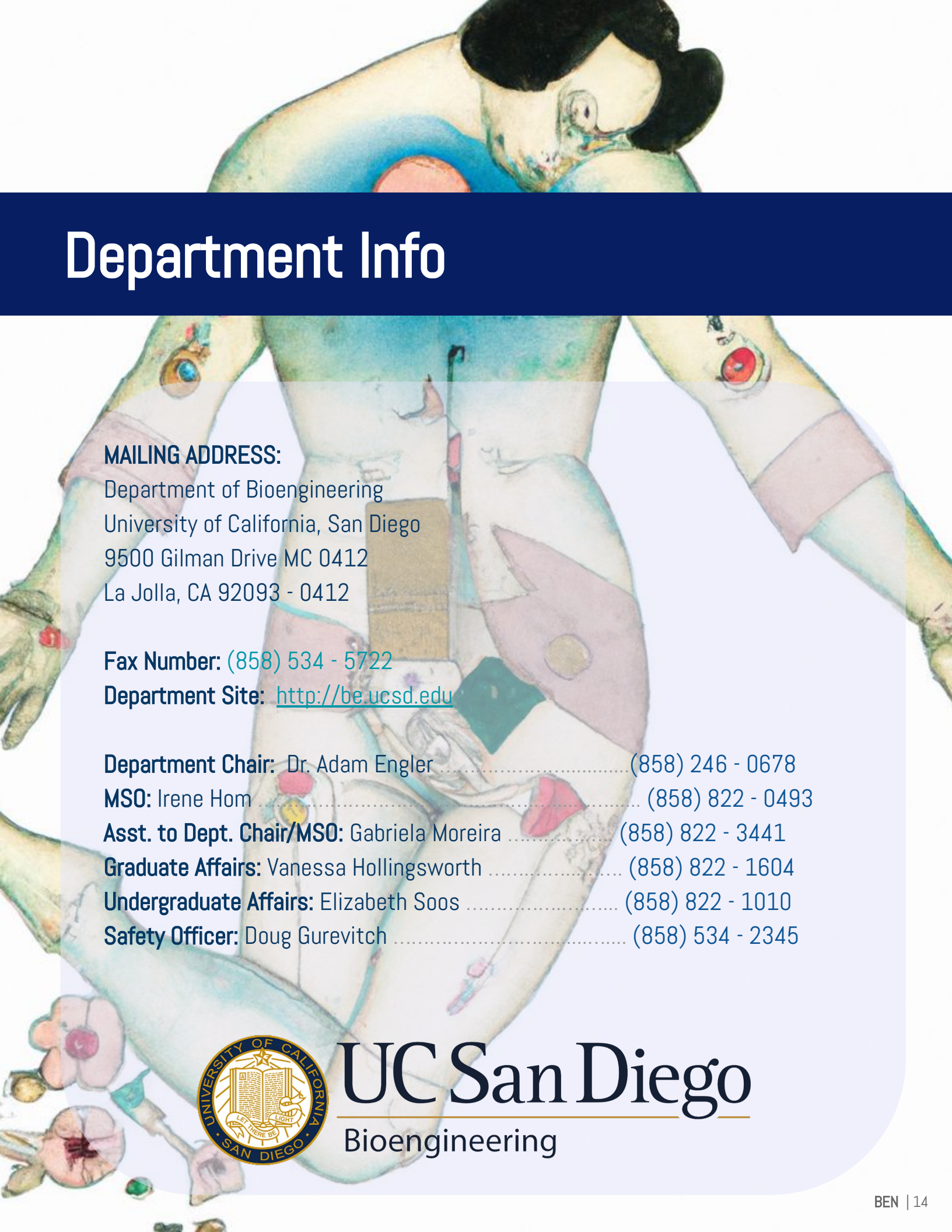
The Chalk Talk seminar series is hosted by the **Undergraduate Bioinformatics Club**, commonly known as UBIC. Each event features a professor or researcher with a research interest closely related to bioinformatics and systems biology. The name "Chalk Talk" comes from the idea that a researcher should be able to present a concept through an informal lecture, using only a chalkboard and chalk. The goal of the chalk talk series is to provide undergraduates with an interest in bioinformatics with exposure to a wide range of applications and experiences within the field.

With UCSD's undergraduate bioinformatics program recently being ranked first in the nation, there is no shortage of brilliant minds to provide students with a wealth of learning opportunities. The chalk talk series also gives students a chance to interact with researchers in smaller group settings and ask in-depth questions. UBIC hosts an average of four to six chalk talks every quarter, and each one features a speaker distilling their research into a few slides that they can present and that a general audience can digest within an hour.

The most recent chalk talk was given by **Dr. Talmo Pereira, Professor and Fellow at the Salk Institute.** He holds a PhD in Neuroscience from Princeton and uses computer vision and deep learning to study animal behavior, neuroscience, and plants. His research interests lie within systems neuroscience, ethology, and plant phenotyping. His talk was about Social LEAP Estimates Animal Poses, or SLEAP, an industry-grade artificial intelligence system. It is an open source deep learning-based framework used to track pose estimation in animals.

Chalk talks are a great networking opportunity for students to get to know professors and principal investigators. With every chalk talk, UBIC hopes to bring students and researchers together in an engaging and accessible way. Stay tuned for more chalk talks in upcoming quarters!

Dr. Pereira shares his research with UBIC members



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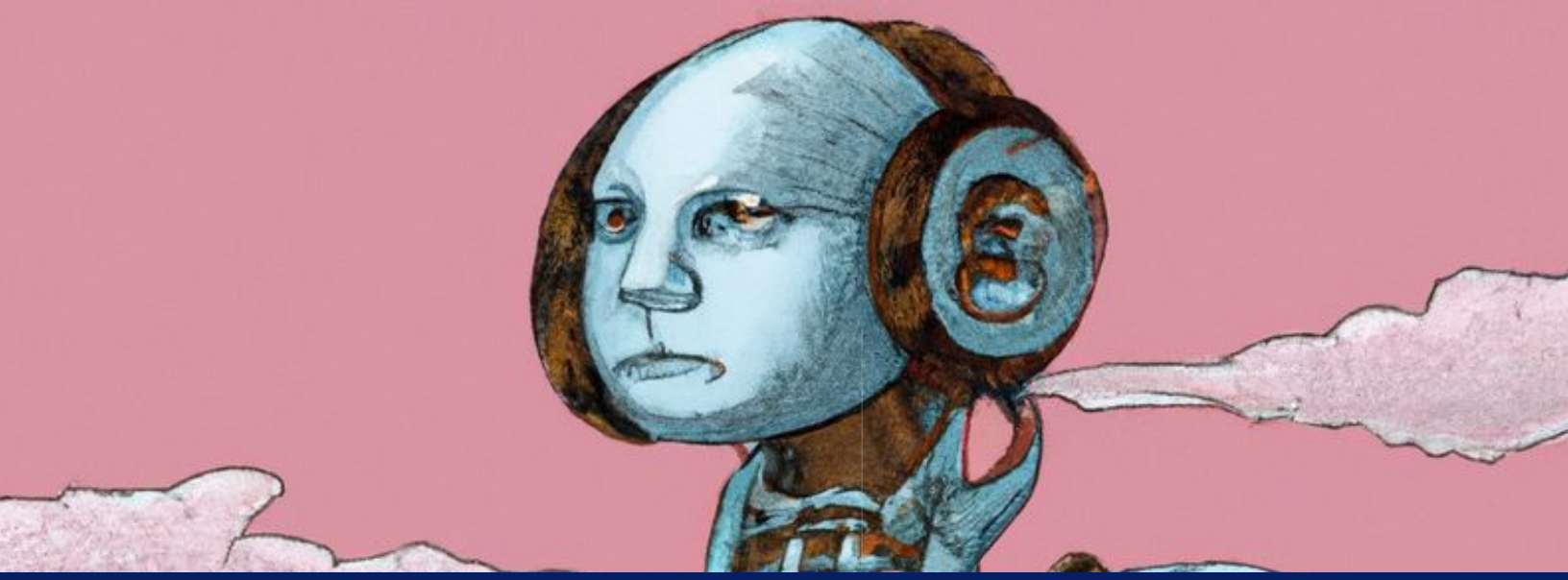

From the Department to You

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Thank you to our family and friends who donated to our various initiatives to advance our educational, research, and community aims.

For more information on giving,
Visit us at be.ucsd.edu

University of California, San Diego Department of Bioengineering

Staff Note

All of us at the BEN would like to thank:

The Bioengineering Department for their overwhelming support of this project; The Biomedical Engineering Society (BMES), Bioengineering Graduate Society (BEGS), Gender Minorities in Bioengineering (GMBE), Undergraduate Bioinformatics Club (UBIC), BE Student Outreach Committee; MS/MEng Coordinator & Undergraduate Advisors **Sandra Marqas** and **Carol Kling** for their help in publicizing and supporting the BEN; the OpenAI software DALL·E 2 for generating artwork; and The Jacobs School of Engineering. Last but not the least, we give our special thanks to Professor Emeritus, **Dr. John Watson,** for working meticulously with us and supporting us as our Community Advisor.