

54TH ANNUAL
SCHOOL OF ENGINEERING

SENIOR DESIGN

CONFERENCE

May 9, 2024
2:00 P.M.



**Santa Clara
University**

School of Engineering

**ENGINEERING WITH
A MISSION**

WELCOME



Dear students, alumni/ae, family, and friends:

Welcome to the 54th Annual Senior Design Conference. We are excited to have you join us for this exhibition of our students' work.

At the School of Engineering our mission is to prepare diverse students for professional excellence, responsible citizenship, and service to society. We look to educate the whole person with distinctive academic programs designed to produce engineers who approach their profession with competence, conscience, and compassion. Today's presentations showcase hands-on, practical experience and theoretical learning that enable our students to graduate with the knowledge, skills, and vision necessary to make a difference in their communities and the world.

Through a wide range of capstone projects—everything from sustainable and affordable building materials that address Nicaragua's urgent housing needs to a low cost, autonomous capable robot for search and rescue efforts, and more—our students have spent their senior year applying their knowledge to complex problems for the benefit of society, putting theory into practice while working collaboratively.

Over the past 54 years, the landscape of projects undertaken by our students has undergone significant transformation since the inaugural Senior Design Conference. Yet, amidst this evolution, our commitment to inspiring and sharing groundbreaking innovations with our expanding community of Bronco engineers remains steadfast. We extend our heartfelt appreciation to those returning to support today's conference and extend warm congratulations to our graduating seniors for realizing their project visions. To all who have played a role in their achievements and the advancement of the School of Engineering, we offer our sincerest gratitude.

Sincerely,



Elaine P. Scott, Ph.D.

Dean

School of Engineering



PROGRAM

12–1:15 p.m. Judges' Check-in

Locatelli Student Activity Center

12:30 p.m. Judges' Lunch and State of the School Address*

Elaine Scott, Dean
School of Engineering

Locatelli Student Activity Center

1:30 p.m. Judges' Welcome and Orientation

Elaine Scott, Dean
School of Engineering

Ruth Davis, Associate Dean of Undergraduate Studies
School of Engineering

Locatelli Student Activity Center

2:15–5:30 p.m. Senior Design Presentations

*Benson Center, Bergin Hall, Kenna Hall,
Harrington Learning Commons &
Orradre Library, and Sobrato Campus for
Discovery and Innovation*

5:30 p.m. Project Demonstrations

*Sordello Family Courtyard at Sobrato Campus
for Discovery and Innovation*

6:30 p.m. Dinner

Locatelli Student Activity Center

**Due to space constraints, this event is open only to conference judges and invited guests.*



BIOENGINEERING SESSION 1

Bergin Hall 116

Novel Nano-binders Treating Alzheimer's Disease

2:15–2:40 p.m.

Katie Ching, Sophie Criscione

Advisor: Bill Lu

Our project is engineering exosomes, lipid nanoparticles naturally produced by cells, for the treatment of Alzheimer's Disease. The exosomes serve as carriers of nano-binder proteins designed to target and bind to amyloid plaques in the brain. Even partial clearance of plaques could significantly improve the prognosis of Alzheimer's patients.

Packed-Bed Reactor for Integrated Peritoneal Dialysis

2:50–3:20 p.m.

Julia Appleget, Allyson Kwong, Megan Moglia

Advisor: Maryam Mobed-Miremadi

The goal is to create an assisted peritoneal dialysis device stimulated by a custom 3-D printed packed bed reactor containing encapsulated urease fibers for uremic toxin removal. This prototype aims to decrease cycle time for patients undergoing peritoneal dialysis.

Investigating Exosome Secretion Using Genetically Engineered Molecular Sensors

3:30–3:55 p.m.

Diego Garcia, Klaus (Pengyang) Zhang

Advisor: Bill Lu

Exosomes are naturally occurring lipid nanoparticles with proven potential in clinical applications. This project tests molecular methods to control exosome secretion, using a novel dual reporter system. Testing with small molecule drugs provides important insights on our ability to regulate exosome secretion.

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BIOENGINEERING SESSION 2

Bergin Hall 214

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AMBER: Ambulatory Monitoring of Biomarkers for Enhanced Recovery

2:15–2:45 p.m.

Ben Serdy, Karl Schumacher, Oliver Hohman

Advisors: Ashley Kim, Maryam Mobed-Miremadi

Our project team is developing a wearable biosensor to monitor free hydrogen peroxide concentrations in the body which is a wearable to inform treatment plans. Our product will be a medical device that is prescribed to patients through their healthcare provider in order to better track the progression of their disease(s).

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Impact Reducing, Variable Volume Prosthetic Liner with Integrated Haptic Feedback

2:50–3:20 p.m.

Luke Brothers, Grace (Gigi) Schaefer, Zoe Straughn

Advisors: Prashanth Asuri, Ashley Kim

Transfemoral amputees experience a change to their residual limb shape due to edema, so they often experience discomfort and pain. We have developed an impact-reducing, variable volume liner with an integrated haptic feedback system that manipulates non-newtonian fluid to offset the change in limb volume.

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Hydrogel-Based In-Vitro Blood Clots

3:30–3:55 p.m.

Ethan Evans, Khoi-Austin Ngo

Advisors: Prashanth Asuri, Maryam Mobed-Miremadi

Creating a hydrogel-based material in-vitro that can replicate the mechanical properties of a blood clot for the purpose of catheter testing.

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Machine Learning for Detection of COVID-Related Cardiomyopathy

4:05–4:35 p.m.

Janhvi Gidha, Emilio Gorog, Kawira Kiruja

Advisors: Yuling Yan, Hamed Akbari

We will be using machine learning and deep learning models to classify cardiomyopathy in COVID-19 and non-COVID-19 patients.



CIVIL, ENVIRONMENTAL AND SUSTAINABLE ENGINEERING SESSION 1

Sobrato Campus for Discovery and Innovation 3301

Design of Sustainable and Affordable Housing for Disadvantaged Communities in Nicaragua

2:15–2:40 p.m.

Guillermo Teran

Advisors: Tonya Nilsson, Hisham Said

Addressing Nicaragua's urgent housing needs, this project transforms a conventional CMU block design into a sustainable and affordable model using local, structural bamboo and adobe plaster. It includes appropriate member size connections, local-code compliant construction drawings, cost estimation and logistics, offering an eco-friendly, affordable housing solution for local communities.

Standardized Sustainable Rapid Housing Design

2:50–3:20 p.m.

Ernesto Escalante, Tito Diaz, Lily Sieber

Advisors: Tonya Nilsson, Hisham Said

Using knowledge of sustainable site and building systems, our project seeks to optimize the efficiency and cost-effectiveness of rapid interim housing developments throughout their lifecycle. This project emphasizes the engineering scopes of structural design, water resources, building envelope design, and construction management.

Dunne Hall Redesign

3:30–4:00 p.m.

Rianna Maulino, Isabel Andaya, Jason Uechi

Advisors: Tracy Abbott, Rachel He

This project focuses on the structural redesign of Dunne Hall through the implementation of modular construction, to efficiently reconstruct the building in a limited timeframe. "Dunne Hall Redesign" uses transportation engineering to design alternative parking lot configurations, traffic signal phase plans, and stormwater and sanitary sewer management, among other considerations.

Calculaser S.A. — Colombian Medical Clinic

4:05–4:35 p.m.

Cody Ferguson, Joell Macias, Aaron Bumagat, Daniela Valencia

Advisor: Hisham Said, Rachel He, Rocio Segura

Calculaser S.A. is a proposed 6-story medical clinic, with a 3-story underground parking garage, for the city of Pereira, Risaralda, Colombia. The team designed the structural, transportation, and construction elements of the project to meet the demands of the community.



CIVIL, ENVIRONMENTAL AND SUSTAINABLE ENGINEERING SESSION 2

Sobrato Campus for Discovery and Innovation 3302

Central Valley Canal Solar Canopies

2:15–2:45 p.m.

Samuel Loeffler, Tommy Vithanage, Danial Garcia, Luke Shoenberger

Advisors: Hisham Said, Laura Doyle, Tracy Abbott

Solar panel canopies designed to cover a canal in the California Central Valley in order to reduce evaporation and promote groundwater recharge in an agricultural community that is dependent on well water.

Sheep Camp Creek Low-Water Crossing Redesign

2:50–3:15 p.m.

Alex Avila

Advisor: Aria Amirbahman

This project involves a feasibility study for the implementation of a hydraulic structure over a scour-critical low-water crossing located in an SFPUC Bio-Habitat Restoration site. Project analysis and design involve structural, hydraulic, and construction considerations for an infrastructure crossing implementation.

IoTsolate: Network Microsegmentation for Managing and Securing IoT Devices

2:50-3:15 p.m.

Anagha Nair, Chloé Morali

Advisors: Behnam Dezfouli, Yuhong Liu

IoTsolate uses virtual local area network (VLAN) micro-segmentation to identify, isolate, and neutralize security risks in IoT devices. These devices have limited processing capabilities, diverse designs, and long lifespans, so they lack adequate shielding from attacks. IoTsolate prevents compromised devices from communicating with others, protecting unaffected devices on the network.

Ultra Low-power, High-Performance Presence Detection System

3:30-4:00 p.m.

Dante Bajarias, Cristian Medal, Jashan Kaeley

Advisors: Behnam Dezfouli, Yuhong Liu

A presence detection system using an accelerometer and T-MOS technology to operate as both a low-power wake-up system for older, resource-intensive security systems and a stand-alone motion-detecting security system.

Edge-Connected Microcontroller Security

4:05-4:35 p.m.

Gavin Ryder, Neena Ekanathan, Divya Syal

Advisors: Behnam Dezfouli, Yuhong Liu

With a wide range of applications and the rise of cyberattacks, securing MCUs has become imperative; however, ensuring MCU performance is also crucial given how interconnected today's systems are. This project examines the security and performance of next-generation microcontroller units (MCUs) leveraging new security solutions for IoT edge applications. By benchmarking these MCUs against key performance metrics, their viability will be assessed to facilitate the widespread adoption of this new firmware.

E-Scooter Black Box

4:45–5:20 p.m.

**Raghav Batra, Joshua Jerome, Mubashir Hussain,
Soham Phadke, Suvass Ravala**

Advisor: Behnam Dezfouli, Yuhong Liu

Our project is a 'black box' system that is able to record and analyze e-scooter riding data for the purpose of detecting misuse and rough handling of e-scooters in order to improve the cost-effectiveness and appeal of ride-sharing services.



COMPUTER SCIENCE AND ENGINEERING SESSION 2

Sobrato Campus for Discovery and Innovation 1302

Enhanced Target Wakeup Time Scheduling for WiFi 6/7 Devices

2:15–2:40 p.m.

Alvin Lee

Advisor: Behnam Dezfouli

Wi-Fi 6 enables the use of novel energy efficiency methods, which can potentially save more power compared to traditional methods available in earlier releases of the standard. In this work, we identify the challenges and propose solutions to address the shortcomings of using these novel power-saving methods in real-world scenarios.

Performance Evaluation of Databases for Packet Capture Storage and Analysis

2:50–3:15 p.m.

James Vong, Daniel Kareti

Advisors: Behnam Dezfouli, Shiva Jahangiri

This project analyzes different databases to evaluate which one is best suited for packet capture data. We will use a testbed that consists of edge devices and a wireless gateway, and then make various operations and queries for each database to test how each one performs.

Efficient Beehive Monitoring

3:30–4:00 p.m.

Jack Ursillo, Connor Merhab, Aneal Kuverji, Anshuman Sahu

Advisors: Behnam Dezfouli, Shiva Jahangiri

This is a continuation project, in which we try to implement a more energy-efficient beehive monitoring system with a newer Machine Learning model and build a React Web application utilizing a database to store and fetch information.

The Impact of Emojis on User Engagement with Trolling Content in Online Platforms

4:05–4:30 p.m.

Diya Saraf

Advisor: Yuhong Liu

This project examines how emojis influence user engagement with trolling content on online platforms, focusing on interaction patterns, emotional responses, and the potential for emojis to amplify or mitigate negative behaviors.



COMPUTER SCIENCE AND ENGINEERING SESSION 3

Sobrato Campus for Discovery and Innovation 1308

MeadowMinds: An AI Literacy Game

2:15–2:40 p.m.

Michelle Yavorskiy, Lydia Kim

Advisors: Sean Choi

MeadowMinds offers a web-based gaming experience designed to facilitate the comprehension of fundamental machine-learning concepts among middle-school students. Through concept simplification, students attain a profound understanding of emerging technologies and their potential risks. This enables them to discern how AI behaviors can have implications in real-world scenarios.

TrendTour: Using ML to determine fashion trends

2:50–3:20 p.m.

Khushboo Gupta, Xiomara Quinonez, Aaron Ancheta

Advisor: Sean Choi

TrendTour uses machine learning and web scraping to forecast fashion trends across various college campuses. Users can access our website to explore trends in colors, silhouettes, and accessories tailored to their individual styles and preferences. Our solution streamlines trend discovery, providing students with a platform to stay updated on the latest fashion trends.

ProtectNIC

3:30–4:00 p.m.

Anson Xu, Arnav Choudhury, Eason Liu

Advisor: Sean Choi

Creating a system that would help detect ransomware using a Smart Network Interface Card (SmartNIC) which runs machine learning algorithms to detect ransomware before it enters the system. This relieves computers in the network of the burden of detecting malware, freeing CPU capacity to do other work.

Deep Learning-Based Single Image Super-Resolution

4:05–4:30 p.m.

Isaac Orais, Sam Smith

Advisor: Ying Liu

The use of big data and surge in new deep learning techniques, especially transformers, has allowed researchers to push the boundaries of super-resolution. We created a single image super-resolution model that learns the relationship between high and low-resolution images to produce high-resolution images from low-resolution inputs.

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COMPUTER SCIENCE AND ENGINEERING SESSION 4

Learning Commons, St. Clare Room

Stereo Image Super Resolution

2:15–2:45 p.m.

Mark Pang, Patrick Dormey, Quinn Samms, Alex Losivas

Advisor: Ying Liu

The project is focused on developing a model for stereo image super resolution with an emphasis on realistic degradation, aiming to improve image quality in real-world situations given left and right views of a scene. We build off of and combine previous state-of-the-art models to achieve this goal.

Web App For Campus Registered Student Organization Interaction and Management

2:50–3:15 p.m.

Ishan Sandhu

Advisor: David Anastasiu

The application will improve the visibility and accessibility of club activities, leading to increased student participation. It will also address the issue of outdated information, providing reliable up-to-date sources for club-related events and contacts. Those in RSO management positions will be able to curate their club in a consistent fashion.

Naturalistic Driving Action Recognition

3:30–3:55 p.m.

Andy Xiao, Antonio Fontan

Advisor: David Anastasiu

Our initiative, part of the AI City Challenge, aims to enhance Naturalistic Driving Action Recognition using Deep Learning. By improving this system, we seek to educate drivers on distracted driving's dangers, emphasizing safety and fostering awareness.

Two-Step Hierarchical Multi-Camera People Tracking

4:05–4:35 p.m.

Eric Huang, Eerina Haque, Sihang Li

Advisor: David Anastasiu

Using computer vision we aim to uniquely identify pedestrians as they move into and out of the field of view of a network of multiple cameras. Our solution aims to leverage Single Camera Tracking to achieve state-of-the-art results, which will be submitted to the 2024 AI City Challenge.

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COMPUTER SCIENCE AND ENGINEERING SESSION 6

Learning Commons 129, Viewing & Taping A

The Journey to Desensitization: A Mobile App for Oral Immunotherapy Patients

2:15–2:40 p.m.

Maddie Waldie

Advisor: Darren Atkinson

This project focuses on developing an iPhone application for Oral Immunotherapy (OIT) patients, leveraging Apple's privacy and security features. The app aims to support patients by seamlessly integrating with the Apple Health app for dose tracking, symptom logging, and visualizing long-term trends, while also providing education on anaphylaxis and OIT.

Virtual Museum Tours

2:50–3:20 p.m.

Justin Enciso-Anaya, Karthik Tamil, Quoc Truong

Advisor: Kai Lukoff

Our project transforms the California Stories exhibit at the de Saisset Museum into an immersive virtual tour, integrating Matterport technology and HCI principles; this collaboration with de Saisset offers visitors a culturally enriching, interactive experience, elevating the standard of virtual museum tours beyond simple walkthroughs to engage a wider audience.

Autonomous Microgrid Agents

3:30–3:55 p.m.

Xavier Kuehn, Brian Xiong

Advisor: Salem Al-Agtash

Microgrids are revolutionary power systems that leverage renewables in a small-scale grid network. This project aims to develop distributed agents, using SPADE (Smart Python Agent Development Environment), to operate the components of a microgrid. The agents will be able to maintain microgrid services during the islanding and disruption of renewables.

AR Storybook

4:05–4:35 p.m.

Jessica Torres, Priya Jain, Melody Trinh

Advisor: Sharon Hsiao

This project implements a physical book paired with an interactive Augmented Reality (AR) application to visualize challenging computational thinking (CT) concepts.

Uruguay Recycling Project

4:45–5:15 p.m.

Kamya Krishnan, Eason Ke, Danny Walsh, Aayooshi Dharmadhikari

Advisor: Shiva Jahangiri

The San Vicente Organization in Montevideo, Uruguay came to the frugal innovation hub looking for a solution to entering and maintaining their data. Our mobile and web applications are a streamlined and robust solution to their problem.

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COMPUTER SCIENCE AND ENGINEERING
SESSION 7

Learning Commons 133, Viewing & Taping B

General Purpose Tuning Data Visualization

2:15–2:45 p.m.

Chris Augustine, Francisco Salinas, Aakash Shetty

Advisor: Younghyun Cho

Some performance auto-tuners utilize databases to collect performance data from multiple sources. This project aims to develop a web application that queries performance data from an existing auto-tuning database (plan to query data from GPTune's shared database which is an open-source autotuning project) and provides user-friendly scientific data visualization.

LLM Parameter Tuning

2:50–3:20 p.m.

Edmund Allen, Darren Inouye, Robin Lee, Lucas Lindo

Advisor: Younghyun Cho

We are viewing applications of Bayesian Optimization on parameter searching in regards to LLMs. Trying to reduce parameter space (applying LoRA method) and tune those reduced models with GPTune.

Distant Horizon: Exploring Human-AI Interaction through Video Games

3:30–4:00 p.m.

Maximillian White, Dalia Suszko, Gabe Labadie

Advisors: Angela Musurlian

A video game that addresses ethical concerns surrounding the use of AI in positions of power. The user plays as a sentient Artificial Intelligence system aboard a spaceship, whose crew members are controlled using Markov Chains and AI methods such as Conceptual Dependency Theory to simulate human behavior.

Personal Trip Planner

4:05–4:35 p.m.

Christian Ochoa, Katie Dangelmaier, Luke Patterson

Advisor: Xiang Li

This project is a user-centric navigation app using AWS-SAM, React Native, Google Maps API, and GPT API. It will process natural language to generate efficient and personalized routes, while incorporating user preferences and needs. Features include multi-stop route planning, personalized recommendations, multiple route options, and secure data storage.

Daily Digest Application

4:45–5:15 p.m.

Justin Wang, George Orloff, Jack Maguin, Justin Groves

Advisor: Xiang Li

The project can help everyone know more in less time. The app will periodically obtain the latest news from sources, and perform content recommendation and digest generation using large language models. The main activities include using and understanding the large language models, performing web crawling, and developing a web app.



ELECTRICAL AND COMPUTER ENGINEERING SESSION 1

Learning Commons Training and Instruction 203

System Design with ChatGPT

2:15–2:40 p.m.

Keeshan Rama, Paul Truong

Advisor: Hoeseok Yang

We will be researching and documenting the potential of ChatGPT to create Verilog code to work in conjunction with hardware. We will be giving the AI different prompts in order to observe the responses we are given and revising the prompts based on the output we wish to obtain.

Hardware Software Co-Design of zk-SNARK

2:50–3:15 p.m.

Dev Shah, Allen Chellasamy

Advisor: Hoeseok Yang

zk-SNARK is a cryptographic proof that allows one user to prove to another user that they possess certain data without revealing that data. Our project utilizes a custom-built hardware accelerator, implemented on an FPGA, to increase the computational efficiency of zk-SNARK.

Santa Clara Hardware Intrusion & Exploitation Discovery (S.H.I.E.L.D)

3:30–3:55 p.m.

Aziz Alajmi, Isaac Wilkinson

Advisor: Hoeseok Yang

Creating budget-friendly hardware security fault injection modules to fortify system resilience. This project focuses on designing cost-effective tools for exploiting security vulnerabilities in electronic systems, providing an accessible means for developers to enhance hardware security measures.

Assistive Mobile Manipulator for People with Limited Mobility

2:50–3:15 p.m.

Matthew Tognotti

Advisor: Maria Kyrarini

This project presents a robotic arm attached to a mobile base, interfaced through speech commands, designed to assist individuals with mobility limitations in accomplishing everyday tasks. The robot retrieves objects for the user and allows the user to create lists of items for future interactions.

VoxLabs: Real-Time Vocal Trainer

3:30–3:55 p.m.

Madhav Danturthi, Aidan Galia

Advisors: Sally Wood, Andy Wolfe

VoxLabs is a hardware-based real-time singing trainer designed to teach people of all ages and skill levels the basics of singing through an entertaining yet challenging environment with real-time corrective feedback, a plethora of musical lessons, and many fun games to play along the way

Automating Theater Lamp Control Using PI Vision

4:05–4:30 p.m.

Clayton Wiley

Advisor: Andy Wolfe

Powered by a Raspberry Pi and an Infrared Camera, this module can be configured with any existing theatrical moving light to automate planar tracking of an actor or any other moving body.

VoxArt: Handcrafting Vocal Audio Effects

4:45–5:10 p.m.

Samuel Stephen, Anthony Ryan

Advisor: Andy Wolfe

VoxART brings vocal expression to a new level of artistic creativity by providing vocalists and musicians a portable, easy to use, vocal audio signal processing system to take on the go. Utilizing a new form control, allowing hand motion to directly control audio effects.

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INTERDISCIPLINARY SESSION 1

Kenna 102

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Acoustic Data Telemetry for Marine Permaculture

2:15–2:45 p.m.

Ben Shiverdaker, Jonathan Lin, Harrison Shaw, Mark Ellersick

Advisor: Jessica Kuczynski, Andy Wolfe

In partnership with the Climate Foundation, we're developing an acoustic data telemetry system to automate a submersible seaweed growth platform in the western Pacific Ocean. Our project aims to drive sustainable adaptation by fostering the optimal growth of a carbon sink, marine habitat, and food source, and to empower seaweed dependent communities with climate-resilient solutions.

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Waypoint Profiler

3:30–4:00 p.m.

Jeffrey Ke, Alex Collins, Ricky Schober, Kevin Wang

Advisors: Christopher Kitts, Michael Neumann

Our project is a robot that can navigate a marine environment to efficiently collect water column data which is vital to oceanographers' understanding of marine ecosystems.

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9-Axis Motion Tracking to Aid Therapeutic Recovery via Visualization, Analysis & Progress Monitoring

4:05–4:35 p.m.

Liam A'Hearn, Megan Wiser, Liam Kelly, Chris Tamayo

Advisor: Sean Choi

An innovative approach to enhance at-home physical therapy exercises through the development of a wearable motion tracking system. The proposed system utilizes motion-tracking bands worn by patients during exercises, specifically focusing on a squat jump for the initial phase of the project.

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Nautilus 23/24: Deep Sea Dexterity

4:45–5:25 p.m.

Ian Staff, Quinn Bates, Sarah Abruzzo, Saunder Salazar, Davis Robertson, Nick Aguilar, Morgan Watts

Advisors: Christopher Kitts, Michael Neumann

Making the operation of Nautilus underwater ROV a user-friendly experience by designing an intuitive GUI along with a novel end-point-controlled end effector.



INTERDISCIPLINARY SESSION 2

Kenna 104

SCU Maps: Augmented Reality Navigation for the SCU Campus

2:15–2:40 p.m.

Nicolas Lopatin, Bryan Alexander

Advisors: Angela Musurlian, Jessica Kuczenski

This project provides an Augmented Reality solution for the SCU community to quickly and efficiently navigate to select indoor and outdoor campus locations. An iOS/Android app locates the user using the device camera, allows for destination selection, and provides turn-by-turn directions using AR elements overlaid on the user's surroundings.

NeuroGen: EEG and Near-Infrared Light Stimulation Control System

2:50–3:15 p.m.

Mike Kreienkamp, Olivia McConaghy

Advisors: Julia Scott, Sally Wood, Andy Wolfe

Transcranial photobiomodulation is an experimental treatment for neurodegenerative disorders and neuroinflammatory conditions. NeuroGen is a hybrid photobiomodulation and electroencephalography device whose purpose is to optimize light-stimulation therapy methods. This will open new possibilities for better clinical outcomes and research on the effects of photobiomodulation on the brain.

PACRR — Piloted Autonomous Crisis Reconnaissance Robot

3:30–4:00 p.m.

Nicholas Kenny, Aidan O'Hare, Luca Chierotti, Tyler Costello

Advisors: Maria Kyrarini, Andy Wolfe, Ahmed Amer

The aim of PACRR is to create a low-cost, autonomous capable quadruped robot for first responder applications like search and rescue, detecting gas leaks, and other situations where it is dangerous or too confined for humans. We are starting with an open-source design for a 3D-printed robot dog, then modifying it to be better suited for rugged and unsafe applications. Our design will be cheaper, simpler, and more expendable, allowing even small organizations to use it.

ALGAE: Advanced Lakebed Guardian and Algae Eradicator

4:05–4:40 p.m.

**Máté Aranyosi, Julien Buist-Thuillier, Victor Calata-Gentil,
Elia Döhler, Brian Yeh**

Advisors: Michael Neumann, Christopher Kitts

A remotely operated marine rover robot designed to efficiently remove harmful invasive algae species from freshwater lakes. The rover will also serve as a modular platform for a variety of environmental marine applications and benthic sample collection for geological and ecological research projects.

**DOLPHIN: Drone-based, Oceanic Landing Platform
with High-tech Integrated Navigation**

4:45–5:20 p.m.

**Keanu Dayton, Ethan Hang, Jack Hartline, Jordan Puetz,
Tomas Ronderos, Zara Shariff**

Advisors: Michael Neumann, Christopher Kitts

We are developing an autonomous, ocean-based, drone landing platform that will have automated navigation, stationkeeping capabilities, and a stabilizing platform. We are modifying the SWATH (small waterplane area twin hull) vessel that was built in 2005 and new technology will be retrofitted to better suit our needs.

MECHANICAL ENGINEERING SESSION 2

Benson Center, Parlors B & C

High-Temperature Vacuum Furnace

2:15–2:45 p.m.

**Alejandro Mendez-Reynoso, Ben Spielman, Manu Bodagala,
Peter Schumacher**

Advisor: Robert Marks

We are designing and building a water-cooled high-temperature vacuum chamber for a tensile tester that can withstand 2000°C. With this attachment, the tensile tester could run tests on materials at high temperatures which would expand the material testing capabilities at SCU.

AIAA — Design, Build, Fly "Aero Avengers"

2:50–3:25 p.m.

**Andres Alba Burbano, Chris Berardino, Jill Chandler, Patrick Hudson,
Andrew Mahler, Nicholas Smith**

Advisor: Mohammad Ayoubi

We are building a next-generation model medical transportation aircraft. This electric-powered plane will be approximately 5ft. by 5ft. with a rotating wing and modular cargo bay.

3D Printing Filament Machine

3:30–4:00 p.m.

Jackson Mar, Adnesh Tondale, Charlie Wallace

Advisor: Robert Marks

We are creating a 3D filament recycling machine that recycles Polylactic Acid(PLA) filament, the most common industry material. It aims to recycle used 3D printed parts into a reusable spool of filament. This product will increase the use life of each filament spool, allowing the industry to be more efficient and affordable. This machine will be automated and include several features that will be intuitive to use while maintaining industry safety standards.

We wish to thank the following alumni/ae, friends, and industry partners whose participation as judges contributes greatly to the success of the Senior Design Conference.

David Aguilar Rodriguez '18
McCarthy Building Companies

Kishore Akshintala '14
Hewlett Packard Enterprise

Gabriel Alcantar '08
Mott MacDonald

Brad Allen '00
Retired – Moog CSA

JP Allport '15
Supermicro

Weston Arnold '07
Intuitive

Himanshu Barapatre
Pixelberry Studios

Colleen Barneson '02

Connor Basch '19
Intuitive

Cullen Bash
Hewlett Packard Enterprise

John Bergman '15
Bergman Prototyping and Racing LLC

Nikita Bhatnagar '17
Alector

Jonathan Borst '19
Intuitive

Chris Brady '98
CP Brady Consulting

Kirk Bresniker '89
Hewlett Packard Enterprise

Martin Bringuel '81
Trimble Inc.

Angel Cardenas '19
RNA Bio

Edmund Cheng '08
Intuit

AnandKumar Chennupati
Coupa Software

Daphne Chu
Actionspot Startup Studio

Graeme Coakley '04
Yale and August U.S.

Tony D'Antonio '91

Nayana Dawalbhakta '00
Criterion Networks

Paula Demartini '06
Lucca Group Inc

Mark Dettle '79
Retired

Steve Douglass '83
Lattice Semiconductor

Travis Duncan '12
DECA

Farhood Farhood Moraveji
Monolithic Silicon Power

Michael Freitas '70
Freitas + Freitas Engineering and
Planning Consultants, Inc.

Hudson Gasvoda
Santa Clara University

Eric Golangco '72
Golangco Global Consulting

Andy Gonzales '75
Retired – NASA

Ashwin Gour
LTI Mindtree Limited

Vishu Gupta
Meta

Bret Gustafson
Intel

Asheet Hakoo '05
Ampere Computing

Jesse Harder '15
Electronic Arts

Caroline Harieg '21

Eden Hensley Silverstein '94
E Hensley World Group

Kurt Holloway '15
Calyxo inc

Brian Holm '00
Intuitive

Dylan Hoover '22
SafeinHome

Brent Hosoume '19
Lockheed Martin

Keith Hung '22
LinkedIn

Robert Kleinhenz '71
Santa Clara University

Jeff Krenek '87

Joy Ku '23
Stanford

Joan Lafferty '99
Adobe Systems

Robert Lathrop '94
Lathrop Product Development

Thuy Le
Promaxo Inc

Joseph Leveque '83
Medikine

Erik Levine '95
Stellar Solutions

Philippe Levy '88
Levy Solutions

Billy Li '00
Google

Shiyin Lim '19
Gilead Sciences

Mike Liu '04

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Alan Louie

Avery Lu '95
Aventurine Capital Group
Jeff Maloney
Google, LLC

Piyush Mangalick '93
Fidget Labs

Brian Mapel '93
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Philemon (Phil) Marcoux '79
PPM Associates

Zefram Marks '09
KLA

Sunil Maulik
SunilM1

Jake Mellor '21
Intel

Michael Meyer '92
NVIDIA

Razma Mogharrab '17
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Amanda Moran '12
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Sri Mudigere '07

Hesham Naja '16
Palisade Builders, Inc.

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Anlotek Ltd.

Mike Nichols '14
Maxeon

Christine Nolan-Brady '02
Google

Bobby Papadatos '01
Olympus

Chitvan Patel '23
Neuro42, Inc.

Mark Pedrazzi '81
Retired – BAE Systems

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Alaskan AirVentures

Shiva Potu
LegalZoom

Ashwin Ramesh Babu
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Mike Robinson '00
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Steve Rodrigues '85
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Guillermo Surraco '90

Jasper Tan '15
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Steve Tarantino '70
EKI Environment & Water, Inc.

Paul Toledo '08
Northrop Grumman

Andrew Torrance '19
JnJ Medtech

Donald Toy '91
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Donald Van Buren '70
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Ashley Waring
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Jason Weaver '96, MS '03
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Claire Wemp '14
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Jose Ysaguirre '79
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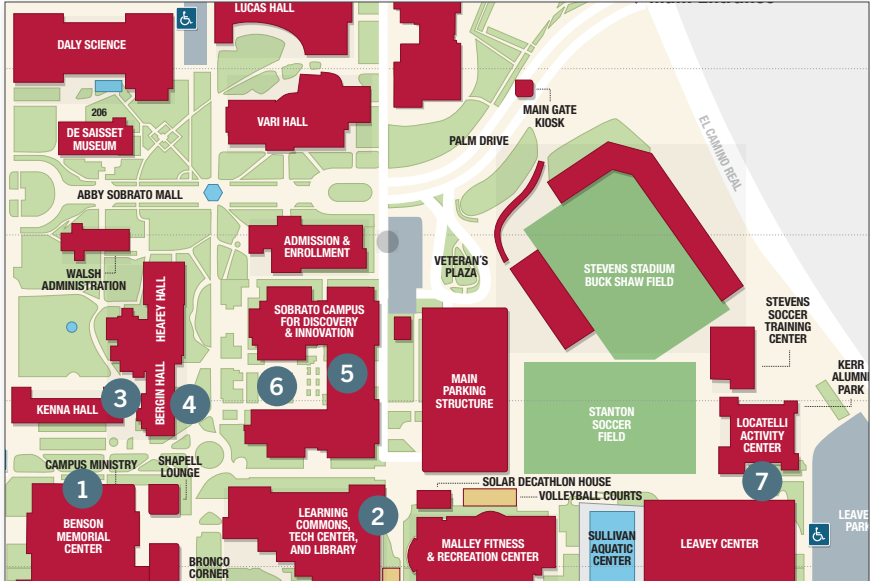
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SENIOR DESIGN CONFERENCE MAP



1 BENSON MEMORIAL CENTER Senior Design Presentations

- Computer Science and Engineering Session 1
- Mechanical Engineering Session 1, 2

2 THE HARRINGTON LEARNING COMMONS & ORRADRE LIBRARY Senior Design Presentations

- Computer Science and Engineering Session 4, 6, 7
- Electrical and Computer Engineering Sessions 1, 2

3 KENNA HALL Senior Design Presentations

- Interdisciplinary Sessions 1, 2

4 BERGIN HALL Senior Design Presentations

- Bioengineering Sessions 1, 2

5 SOBRATO CAMPUS FOR DISCOVERY AND INNOVATION Senior Design Presentations

- Civil, Environmental and Sustainable Engineering Sessions 1, 2
- Computer Science and Engineering Sessions 2, 3

6 SCDI SORDELLO FAMILY COURTYARD Project Demonstrations

7 LOCATELLI ACTIVITY CENTER Judges' Check-in

Judges' Lunch and State of the School Address

Judges' Welcome and Orientation

Dinner