

UROC OPEN RESEARCH OPPORTUNITIES DATABASE

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To find a research project that aligns with your research interest, take a look at the research projects at CSUMB and off-campus. If you would like to learn more about the research opportunity, please reach out to the mentor with:

- An email introducing yourself and why you are interested in their project. Please put “UROC Research Project Interest” in the subject line. Highly recommend adding your Resume, CV, or Academic Resume.
- Please click on the college or department to see open research opportunities or you can use the outline on the left side of the page.

COLLEGE OF ARTS, HUMANITIES, AND SOCIAL SCIENCES

[CINEMATIC ARTS & TECHNOLOGY](#)

[HUMANITIES AND COMMUNICATION](#)

[PERFORMING AND VISUAL ARTS](#)

[PSYCHOLOGY](#)

[SOCIAL SCIENCES AND GLOBAL STUDIES](#)

[WORLD LANGUAGE AND CULTURES](#)

COLLEGE OF BUSINESS

[SCHOOL OF BUSINESS](#)

COLLEGE OF EDUCATION

[EDUCATION AND LEADERSHIP](#)

[HUMAN DEVELOPMENT AND FAMILY SCIENCE](#)

COLLEGE OF HEALTH SCIENCES AND HUMAN SERVICES

[HEALTH, HUMAN SERVICES, AND PUBLIC POLICY](#)

[KINESIOLOGY](#)

[SOCIAL WORK](#)

COLLEGE OF SCIENCE

[APPLIED ENVIRONMENTAL SCIENCE](#)

[BIOLOGY AND CHEMISTRY](#)

[COMPUTING AND DESIGN](#)

[MARINE SCIENCE](#)

[MATHEMATICS AND STATISTICS](#)

[MECHATRONICS ENGINEERING](#)

UNIVERSITY COLLEGE

[SERVICE LEARNING INSTITUTE](#)

[TANIMURA AND ANTLE LIBRARY](#)

COLLEGE OF ARTS, HUMANITIES, AND SOCIAL SCIENCES

CINEMATIC ARTS & TECHNOLOGY

PROJECT TITLE	Fires of Change: Battling Invasive Eucalyptus for a Safer Future
PROJECT MENTOR	Chris Carpenter
PROJECT CONTACT INFORMATION	ccarpenter@csumb.edu
PROJECT DESCRIPTION	How can film and multimedia storytelling effectively communicate the impact of invasive species management and wildfire prevention efforts on local communities, ecosystems, and climate resilience? Explore how visual storytelling—through documentary filmmaking, interviews, and cinematic techniques—can raise awareness and engage the public in understanding the importance of invasive eucalyptus removal, wildfire risk reduction, and the broader environmental benefits of these efforts in the Monterey Bay area.
RESPONSIBILITIES	Develop production schedules, crew and gear lists from existing classes at CSUMB. Research content for questions. Plan and promote screening on and off campus.
REQUIREMENTS	The full understanding of creating a production from pre, post and distribution
OTHER IMPORTANT INFORMATION	We have already connected with our alum at the Moss Landing Slough Foundation who are excited to work with our future UROC Scholar/Researcher.

PROJECT TITLE	Improving photo sensitive epilepsy dictation on streaming platforms
PROJECT MENTOR	Chris Carpenter
PROJECT CONTACT INFORMATION	ccarpenter@csumb.edu
PROJECT DESCRIPTION	How can real-time detection and mitigation systems for photosensitive epilepsy triggers on streaming platforms be improved, and what are the key challenges and potential solutions? This study aims to explore the challenges and potential solutions for implementing effective real-time systems that detect and mitigate photosensitive epilepsy triggers, such as flashing lights or high-contrast patterns, on streaming platforms. Photosensitive epilepsy affects a subset of individuals who are at risk of seizures triggered by certain visual stimuli. While platforms have made strides in identifying problematic content during post-production or pre-upload phases, real-time streaming presents unique challenges, including computational efficiency, false positive/negative rates, and diverse content types. The research will: 1) Identify Current Practices: Review existing systems and technologies used for epilepsy-trigger detection on streaming platforms, including machine learning algorithms, content analysis tools, and policy frameworks. 2) Explore Challenges: Analyze technological, operational, and ethical challenges, such as latency in detection, content diversity, and balancing user accessibility with creative freedom for content creators. 3) Propose Solutions: Develop and evaluate innovative methods for improving detection accuracy and response time, including advanced AI models, user customization features, and real-time warning mechanisms. 4) Assess Impact: Examine the effectiveness of proposed solutions through simulation or case studies and explore their implications for users, content creators, and streaming platforms. This research will contribute to creating safer and more inclusive streaming environments while advancing the field of real-time content moderation.
RESPONSIBILITIES	The student assistant will play a crucial role in supporting the research project on improving real-time detection of photosensitive epilepsy triggers on streaming platforms. Their responsibilities will include: Literature Review: Conduct thorough reviews of existing research and technologies related to photosensitive epilepsy, real-time detection systems, and content moderation on streaming platforms. Synthesize findings into concise summaries to inform

	the project's methodology and discussions. Data Collection and Analysis: Assist in gathering case studies or examples of streaming platform incidents involving photosensitive epilepsy triggers. Analyze platform policies, existing technological implementations, and their efficacy. Technology Testing: Test and evaluate real-time detection software or algorithms, focusing on performance metrics such as latency, accuracy, and usability. Record observations and document performance results in detail. Stakeholder Engagement: Help develop surveys or interview questions to gather insights from key stakeholders, such as streaming platform engineers, epilepsy advocacy groups, and affected users. Assist in administering surveys and conducting interviews as needed. Creative Problem-Solving: Contribute to brainstorming sessions to propose innovative solutions for improving detection systems and addressing identified challenges. Presentation and Reporting: Prepare visual aids (e.g., charts, graphs, infographics) to effectively communicate findings during meetings or presentations. Draft sections of progress reports, papers, or presentations to document research developments. The student assistant will gain hands-on experience in research methods, technology assessment, and applied problem-solving in an interdisciplinary context, contributing significantly to the project's outcomes.
REQUIREMENTS	The student needs strong research and analytical skills, proficiency in literature review and synthesis, familiarity with data collection methods, basic technical aptitude (e.g., testing software or algorithms), effective communication skills for stakeholder engagement, and creativity in problem-solving.
OTHER IMPORTANT INFORMATION	

HUMANITIES AND COMMUNICATION

PROJECT TITLE	Central Coast Lowrider Oral History Project
PROJECT MENTOR	Kristen La Follette
PROJECT CONTACT INFORMATION	klafollette@csumb.edu
PROJECT DESCRIPTION	The Central Coast Lowrider Oral History Project celebrates the richness of car culture in the local Latine community. The project's focus on solo riders and car clubs serves to lift up the local lowrider community to recognize the artistry, ingenuity and enduring sense of belonging built through lowriding. Oral history interviews counter prevailing narratives, and appreciate the vibrancy of our region. As stereotypes surrounding lowrider owners are often negative and inaccurate, this project is essential to break down harmful assumptions and emphasize the community building capacity that lowrider clubs embody.
RESPONSIBILITIES	Students will interview local lowrider car owners or edit existing transcripts for accuracy
REQUIREMENTS	Interest in research, collaboration with mentor, desire to interview, appreciation for local culture
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Environmental Racism & Coastal Access Disparity in the Enclosed “17 Mile Dr”
PROJECT MENTOR	Kaiqi Hua
PROJECT CONTACT INFORMATION	khua@csumb.edu
PROJECT DESCRIPTION	The world famous “17 Mile Dr” in Monterey County is only available to those who can pay for a one-way daily ticket at the gates. This fully enclosed land encompasses some of the most breathtaking views of California’s Central Coast, such as China Rock and the Lone Cypress, and some of the most expensive real estates in California. Living in the main town that holds the “17 Mile Dr,” Pebble Beach there are 91% non-Hispanic white residents with affluent backgrounds. Conversely, Monterey County has a diverse population from various socioeconomic backgrounds with 62% Hispanic residents. Historically, all of Pebble Beach including Del Monte forests had vibrant immigrant communities, but over time the entire area has been purchased and gated by big corporations under the guise of protection of the environment and privacy for the residents. How did the developers use contracts, zoning laws, and additional methods to push out some of the original residents including people of color? How was this impacted by golf courses and the Pebble Beach Company dealings with people of color in business, land disputes, and community access? What is the racial history of the Pebble Beach Concours d'Elegance and Monterey Car Week that are continually held in the 17 Mile Dr, with primarily senior white attendees? How do the current owners of the 17 Mile Dr and community leaders comply with the California Coastal Act to allow public access to the coastline and beaches? What are the legalities behind admission fees and usage of the road, and are they meant to keep the tourist numbers low or restrict public access to people of color? Are the environment and resources including the beaches and forests there being protected by the strict access rule as they claim? Overall, how does environmental racism and coastal access disparity play roles in the formation of the restricted “17 Mile Dr” today, and are there any legal solutions available to challenge the landowners to open access to the public with no fee requirement?
RESPONSIBILITIES	Collect primary and secondary sources, visit collections in local archives and libraries, review public records from government offices, write summaries and analytical notes on the sources collected.
REQUIREMENTS	Good research and writing skills, social justice motivated, familiar with local laws and policies, interested in law, history, and environmental studies.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Where is gainful employment now?
PROJECT MENTOR	Barbara Zanger Zuniga
PROJECT CONTACT INFORMATION	bzangerzuniga@csumb.edu
PROJECT DESCRIPTION	Where are most likely employment opportunities for students in the social sciences?
RESPONSIBILITIES	Reviewing best job placements currently
REQUIREMENTS	good researchers, clever at finding less obvious paths
OTHER IMPORTANT INFORMATION	keen awareness of where to find job opportunities

PERFORMING AND VISUAL ARTS

PROJECT TITLE	Heritage Musics of Monterey Bay Oral History Project
PROJECT MENTOR	Violet Cavicchi Muñoz
PROJECT CONTACT INFORMATION	vcavicchimunoz@csumb.edu
PROJECT DESCRIPTION	The research project is a collaborative oral history in which students develop concepts, methods, and tools for curating an archive of interviews with local musician from the Monterey region as part of a Heritage Music Oral History Project. Through this project, students will apply concepts in American music and oral history by facilitating the testimony of an individual music practitioner about their musical experience and knowledge. The project will include guided practice with archival historical materials to develop a framework of interview

	questions; instruction in oral history research methods, ethical considerations, and use of recording technology; collaborative creation of the narrative through conducting an oral history interview; and public preservation of the resulting interview recording, as well as written transcription and summary. The resulting research materials will be published as part of a Heritage Music Oral History Project digital archive available for other researchers and users on the CSUMB Library's Digital Commons.
RESPONSIBILITIES	The student will gain experience in oral history interviews, audio recording, and digital humanities by curating and archiving a digital repository of interviews with local musicians. Additionally, the student will support development of an online platform for public access to materials.
REQUIREMENTS	Training in oral history and/or ethnographic research methods, especially interviewing and transcription; ability to synthesize and summarize primary sources; sound recording and editing audio files; experience with Google Drive, Google Sites, and digital multimedia.
OTHER IMPORTANT INFORMATION	A student with experience in music, folklore, oral history, public humanities, museum studies, and/or anthropology would be great.

PSYCHOLOGY

SOCIAL SCIENCES AND GLOBAL STUDIES

PROJECT TITLE	International Oral History Project
PROJECT MENTOR	Juan Jose Gutierrez
PROJECT CONTACT INFORMATION	juagutierrez@csumb.edu
PROJECT DESCRIPTION	What was the historical process of the disappearance of the last peasant communities in Spain? Students will receive Oral History Interviewing training and will then help train other community members.

	This is part of the SSGS Spain Summer Program.
RESPONSIBILITIES	Will participate in training sessions and then conduct oral history interviews
REQUIREMENTS	Fluency in the Spanish language, basic knowledge of historical background on Europe and the European peasantry. Basic social science research skills (interviewing, field note taking, ethics).
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	AI and Your Career Path: How Young Adults Envision Work Today
PROJECT MENTOR	Dr. Max Papadantonakis
PROJECT CONTACT INFORMATION	mpapadantonakis@csumb.edu
PROJECT DESCRIPTION	Artificial intelligence (AI) is rapidly changing what work looks like and how young people imagine their futures. From AI tools used in classrooms to automated hiring systems and algorithmic scheduling, students are encountering AI at nearly every stage of education and early career development. Public conversations often highlight job loss and automation, but we know much less about how these technologies shape students' sense of purpose, identity, and calling in relation to work. This project asks: How is the meaning of vocation being transformed for

	students and early-career professionals in the age of AI? In other words, when AI is embedded in learning, advising, and early job experiences, how do young people think about what kinds of work are worth doing, who they can become, and where they belong? To answer these questions, the project uses a qualitative, interview-based approach. We will conduct semi-structured interviews and surveys with students, early-career professionals, and advisors connected to CSU Monterey Bay and the surrounding community. We are especially interested in people who are navigating transitions—from college to work, between majors, or into new roles—at a time when AI is reshaping expectations about jobs, skills, and career paths. UROC Student Research Participation The UROC student researcher will be an integral member of the research team and will participate in multiple stages of the project, including: Recruitment and data collection
RESPONSIBILITIES	The UROC student researcher will assist with participant recruitment, outreach, and scheduling; help prepare materials for semi-structured interviews; and, when appropriate, co-conduct or independently conduct interviews under supervision. The student will administer a short online survey, ensure proper informed-consent procedures, and maintain accurate records of participant interactions. They will also be responsible for transcribing interviews, organizing and securely storing data, and supporting the preparation of presentations or summaries of findings. These activities will provide hands-on experience with qualitative research logistics, interviewing, and project coordination.
REQUIREMENTS	The ideal UROC student will have strong communication and interpersonal skills, an interest in interviewing or qualitative research, and the ability to interact professionally with participants. Attention to detail, reliability, and strong organizational skills are essential for managing scheduling, outreach, and transcription tasks. Familiarity with basic research ethics or willingness to learn them is important. No prior experience with qualitative methods is required, but curiosity about the impact of AI on education, work, or society is beneficial.
OTHER IMPORTANT INFORMATION	Students interested in this project should enjoy thinking critically about work, technology, and social change. Because the study explores how AI is reshaping early career pathways, it is especially well suited for students in the social sciences or related fields who are curious about people's lived experiences and the social forces that shape them. Prior research experience is not required; what matters most is an interest in qualitative inquiry, a thoughtful approach

to sensitive conversations, and a commitment to understanding how young adults make meaning of work in a rapidly changing world.

PROJECT TITLE	Entering Work in the Age of AI: Young Adults' Perspectives on Vocation and Stability
PROJECT MENTOR	Dr. Max Papadantonakis
PROJECT CONTACT INFORMATION	mpapadantonakis@csumb.edu
PROJECT DESCRIPTION	This project examines how college students and recent graduates think about work, long-term stability, and “making it” in a period shaped by economic volatility and emerging technologies, including AI. The central research question is: How do young adults conceptualize vocation, career security, and adulthood under conditions of technological and economic change? The study is based on qualitative, semi-structured interviews with

	undergraduate seniors, recent graduates, and early-career professionals. The UROC student will participate in data collection and qualitative analysis, contributing to an ongoing research project that will result in conference presentations and manuscript preparation.
RESPONSIBILITIES	The UROC student will assist with participant recruitment and outreach, conduct or co-conduct semi-structured interviews (following training), and transcribe and organize interview data. They will code qualitative data using thematic analysis, read and synthesize relevant sociological literature on work, precarity, and technology, and contribute to analytic memos and preliminary findings
REQUIREMENTS	Applicants should have strong writing and communication skills, a demonstrated interest in sociology or related fields such as work, inequality, or technology, and careful attention to detail. Comfort engaging in qualitative research is important, as is the ability to work independently and manage time effectively.
OTHER IMPORTANT INFORMATION	

WORLD LANGUAGE AND CULTURES

COLLEGE OF BUSINESS

SCHOOL OF BUSINESS

PROJECT TITLE	AI chatbot adoption
PROJECT MENTOR	Xiaotong (Cate) Liu
PROJECT CONTACT INFORMATION	xiaoliu@csumb.edu
PROJECT DESCRIPTION	A chatbot is a computer program that conducts a conversation in natural language and sends a response based on business rules and data tuned by the

	organization. This research compares chatbot with traditional website interface and provides insights for chatbot development.
RESPONSIBILITIES	administering surveys to test subjects, reading and synthesizing literature related
REQUIREMENTS	Google scholar, word, Excel
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Critical approach to AI use in college students
PROJECT MENTOR	Jenny Lin
PROJECT CONTACT INFORMATION	jelin@csumb.edu
PROJECT DESCRIPTION	Research question: This projects aims to understand two broad questions regarding learning of AI use in college. Can AI create wider divides among college student demographics? What are some practices to intervene and promote critical thinking in times of polarization? Project details: To address these questions, the researchers will first conduct surveys to understand the current use of AI in college students to learning,

	include approach to coursework and research projects. Background characteristics of the students are further understood. The next phase of the study will involve implementation of interventions and teaching practices in the classroom that may involve a more longitudinal tracking of learning process, mindset and approach to technology, methods of conducting critical thinking, etc. Purpose: Research conducted will be used to inform higher education practices and aim to present and publish in high impact conferences and journals.
RESPONSIBILITIES	Students will be expected to be involved in the design and implementation of the survey and interventions. Preparatory work include conducting literature review, completing the Human Subject Research training, hold regular meetings with the faculty mentor, review and synthesize literature, assist with data collection and data analysis.
REQUIREMENTS	Basic understanding of research and analytical skills. Willing to learn and have open communication with faculty mentor. Interdisciplinary experiences are preferred. Open to business AND non-business students. Other preferred (but not required) experiences such as interest in technology, user design, education, pedagogy, or just open to exploring research topics that have social impact are welcome.
OTHER IMPORTANT INFORMATION	I have mentored over 20 UROC students (undergrad and graduate students) in the past and although I am a faculty in the college of business, my interdisciplinary research background span consumer behavior and psychology, management, and with an international orientation. My mentoring style is flexible, and I believe strongly in having open communication. I enjoy engaging with students who want to learn and have an open mind. Please feel free to reach out to just discuss or learn more about the project: Dr. Jenny Lin jelin@csumb.edu.

PROJECT TITLE	Entrepreneurial Founders and Compassion
PROJECT MENTOR	Rosalyn Sandoval
PROJECT CONTACT INFORMATION	rossandoval@csumb.edu
PROJECT DESCRIPTION	Entrepreneurship is often described as a masculine field emphasizing masculine traits (Bird & Brush, 2002). In addition to working in a male-dominated field, women entrepreneurs often face gender role biases and stereotypes, which puts men who seemingly fit the masculine norm of entrepreneurship at a higher status, and for women, this means that their entrepreneurial abilities and the viability of their business are held to lower

	expectations. Often, women that align more with masculine stereotypes of entrepreneurship signal personal qualities that fit that stereotype (Thébaud, 2015). At other times, women can benefit from maintaining consistency with their gender stereotypes (e.g., women are seen as more trustworthy and obtain more funding due to this perception; Johnson et al., 2018). With this in mind, the present research examines how compassion at work, a trait stereotypically associated with women and their roles, influences new venture performance by examining employee outcomes such as performance, well-being, engagement, and burnout. This is a great project to learn some valuable research skills within qualitative research methods. No experience is needed, just a willingness to learn.
RESPONSIBILITIES	Interview founders and employees, Qualitative data analysis
REQUIREMENTS	
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Environmental, Social, and Governance (ESG) Financial Statement Disclosures
PROJECT MENTOR	Gary Schneider, Sharon (Shaowen) Hua, Tess (Rixing) Lou
PROJECT CONTACT INFORMATION	gschneider@csumb.edu shua@csumb.edu rlou@csumb.edu
PROJECT DESCRIPTION	We have multiple projects ongoing that examine US firms' motivations to make voluntary ESG disclosures and how those motivations affect the reliability and quality of those disclosures.

	ESG disclosures are not yet required in the US (as they are in other countries), but they are on the way. Students interested in business or the regulation of business activity that affects the environment or social justice issues (including, for example, political science, psychology, environmental studies, or sociology students) could find this work to be rewarding.
RESPONSIBILITIES	Students (up to three) may choose to participate in archival data gathering (querying databases and synthesizing results), administering online surveys, tabulating survey results, reading and summarizing existing literature, and formulating new research questions.
REQUIREMENTS	Interest in the topic of financial statement disclosures (ESG or other) and some basic Excel skills. Chatbot AI or Python familiarity would be a plus, but is not required. We can teach students the rest of what they'll need to do this work.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	AI based technology adoption in business
PROJECT MENTOR	Xiaotong (Cate) Liu
PROJECT CONTACT INFORMATION	xiaoliu@csumb.edu
PROJECT DESCRIPTION	The project will focus on the theory and empirical study of technology adoption. The project will include survey and experiment development.

RESPONSIBILITIES	clean data, test survey, test experiments
REQUIREMENTS	writing skills, good communication skills, be proficient with excel, word
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Paleo-biology estimates of carbon sequestration
PROJECT MENTOR	Jenny Kuan
PROJECT CONTACT INFORMATION	jkuan@csumb.edu
PROJECT DESCRIPTION	Paleo-biology research estimates historic population levels of individual species. Usually, estimates go back decades or even centuries and show a

	decline in population levels. My research question is: How much carbon used to be sequestered in the form of living beings? To answer this question, I want to gather a collection of paleo-biology studies and then calculate the amount of carbon that would be sequestered in each species to generate an estimate of the amount of carbon that was historically sequestered by species studied by paleo-biologists.
RESPONSIBILITIES	A student could help gather paleo-biology studies and help calculate the amount of carbon in an individual of each species.
REQUIREMENTS	Familiarity with scholarly journals (how to look for studies cited in the literature) If unfamiliar with scholarly journals, you can learn while working on the project.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Effectiveness, Adoption, and Usage of Mobile applications for diabetes self-management care: A Systematic Review
PROJECT MENTOR	Shwadhin Sharma
PROJECT CONTACT INFORMATION	ssharma@csumb.edu

PROJECT DESCRIPTION	With more than 537 million adults (ages 20-79) worldwide living with diabetes in 2021, it has become one of the most prevalent diseases (International Diabetes Federation, 2022). Recent advancements in smartphone technology, along with widespread access to data connectivity, have sparked growing interest in mobile applications for diabetes self-management, leading to remarkable growth in this area. The objective of this study is to determine, using a systematic review of existing studies, whether mobile diabetes applications have been effective, well-adopted, and used by diabetes patients. While there have been several systematic reviews of the existing studies to understand the quality and effectiveness of mobile technology, few of these studies are focused on minority population groups such as Latinx communities that are highly prone to diabetes. Our study will focus on finding the existing mobile technology features, adoption trends, usage, experimental settings of previous studies, and the gap that exists.
RESPONSIBILITIES	Students (up to two) would read published journal articles and perform literature reviews to create a summary of mobile technologies being used in diabetes self-care. Students will be recording information regarding mobile technology features, adoption, usage, experimental settings of the study, information about the study, and overall findings.
REQUIREMENTS	Basic understanding of journal articles and the ability to synthesize and summarize them would be helpful. Knowledge of research design can be helpful as well.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	AI Usage, Critical Thinking, and Equity
PROJECT MENTOR	Dante Di Gregorio
PROJECT CONTACT INFORMATION	ddigregorio@csumb.edu
PROJECT	Does generative artificial intelligence (GenAI) usage build or undermine critical

DESCRIPTION	thinking skills? Does this impact vary among students with implications for educational equity? GenAI can be used to enhance critical thinking, but it also has the potential to serve as a hazardously convenient replacement for critical thinking. As the adoption of GenAI diffuses unevenly across individuals and contexts—reshaping job roles and altering the value of other skills—the relationship between GenAI usage and critical thinking may be moderated by personal attributes such as self-efficacy and motivation. These dynamics raise important equity concerns. This research investigates the dual role of GenAI as both a complement to and substitute for critical thinking among undergraduate business students, with particular attention to equity-related user background factors such as socioeconomic status, self-efficacy, grit, curiosity and growth mindset. This project will build upon recent research into GenAI usage and cognitive offloading while incorporating equity considerations and a human-centered AI pedagogical intervention, using a study designed proposed along with data collected from classes at different points in the curriculum. By comparing outcomes across student populations, the study aims to assess the nuanced impacts of GenAI usage on critical thinking and educational equity. Findings will inform curriculum design and instructional practices, with broader implications for teaching, learning, and workforce preparation. The student will help gather data, report results and develop educational materials based on the findings.
RESPONSIBILITIES	administering surveys, reading and synthesizing research, assisting in presentation of results and development of educational materials
REQUIREMENTS	familiarity with AI platforms including ChatGPT from a users perspective; interest and/or training in AI usage, interest and/or training in education and professional development
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Central Coast History: Agriculture Pioneers
PROJECT MENTOR	Jenny Kuan
PROJECT CONTACT INFORMATION	jkuan@csumb.edu

PROJECT DESCRIPTION	The study traces the ag industry through the families who settled in the Monterey Bay region to farm. Many of the families are still in the region, stewarding the land and the industry.
RESPONSIBILITIES	Research historical documents including local newspapers, county clerk documents, and company histories. Students may also conduct interviews (if they want).
REQUIREMENTS	Good reading and writing skills. An interest in history.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	The Outcomes of AI Resume screening of Immigrant Applicants
PROJECT MENTOR	Jason Lambert
PROJECT CONTACT INFORMATION	jalambert@csumb.edu

PROJECT DESCRIPTION	Increasingly more companies are utilizing Large Language Models (LLMs) to reduce the amount of employee labor needed to effectively screen applicant resumes. Smaller companies and small business owners who lack the resources to employ human resources employees may rely on LLMs as an efficient way to sort and select top candidates from hundreds or even thousands of resumes. Findings from prior research suggest that LLMs can show bias towards employees with disabilities, and employees who are traditionally marginalized racially and based on gender. The aim of our research study is to investigate how LLMs will evaluate applicants based on their eligibility to work in the U.S. We investigate the following research questions: 1. Are immigrant applicants evaluated more favorably or poorly by LLMs than domestic applicants based on the information on their resume? 2. How does perceived race or ethnicity, and gender intersect with applicants' immigrant status to influence their evaluation? 3. Does perceived degree of acculturation or education attainment influence their evaluation by LLMs?
RESPONSIBILITIES	Students will be responsible for curating, reading, and synthesizing literature related to the research topic. They will be involved in planning methodology including the creation of fictitious resumes and developing prompts to be used with ChatGPT and Claude for the resume screening bootstrapping process. Students may administer surveys to pre-test the reliability and validity of names used for fictitious resume applicants and run simple statistical tests. In order to be listed as a co-author, I ask all student researchers to be willing to contribute in writing at least a few paragraphs of the introduction and discussion sections, in addition to helping conduct the actual research.
REQUIREMENTS	Ability to attend bi-weekly meetings on Zoom. Complete work assignments in a timely manner. Summarize in writing at least one research article on a bi-weekly basis. Knowledge of SPSS, R-Lavann, Dedoose, or Nvivo is preferred but not required.
OTHER IMPORTANT INFORMATION	My research primarily investigates how employee and employer behaviors and policies impact organizational and employee outcomes. As such, my research is interdisciplinary drawing from business, ethnic studies, gender studies, social psychology, and sociology. I have worked with both undergraduate and graduate students on research since 2019. Two undergraduate students who I conducted research with received acknowledgements in one of my published papers (see Lambert & Akinlade, 2019) that they included on their resume. I also conducted research with two more MBA students that resulted in two different publications (see Lambert, Smith, Yeatts, & Dzvurumi, 2025; Lambert, Brown, Lambert, & TorresNava, 2024) with them each listed as published co-authors. My goal is for you to learn about management research from a hands-on approach.

PROJECT TITLE	Machine Learning for Demand Forecasting and Inventory Optimization in Sustainable Supply Chains
PROJECT MENTOR	Xiaotong (Cate) Liu
PROJECT CONTACT INFORMATION	xiaoliu@csumb.edu

PROJECT DESCRIPTION	This research project investigates how machine learning (ML) techniques can improve demand forecasting and inventory optimization in sustainable supply chains. The central research question guiding this project is: How can machine learning models enhance demand forecasting accuracy and support inventory decisions that simultaneously improve operational efficiency? Accurate demand forecasting is critical for reducing overproduction, minimizing stockouts, lowering waste, and decreasing carbon emissions across supply chains. Traditional forecasting models often struggle with demand volatility, seasonality, and complex nonlinear patterns. This project explores whether modern machine learning approaches—such as regression models, tree-based methods (e.g., Random Forest, Gradient Boosting), and neural networks—can produce more accurate and adaptive forecasts. We will also examine how improved forecasts translate into better inventory policies that reduce excess stock or stockout. Collecting and cleaning real-world or open-source supply chain datasets Performing exploratory data analysis (EDA) to identify patterns, seasonality, and trends Engineering features relevant to forecasting (e.g., lag variables, rolling averages, promotional indicators) Implementing and comparing machine learning forecasting models Evaluating performance UROC Student Research Participation
RESPONSIBILITIES	Conducting exploratory data analysis and visualizations
REQUIREMENTS	interest in this subject, willing to learn
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Agriculture Business and Technology Case Studies
PROJECT MENTOR	Jenny Kuan
PROJECT CONTACT INFORMATION	jkuan@csumb.edu
PROJECT DESCRIPTION	Our region has a long history in agriculture with companies that have endured over the past century. How have these companies survived let alone thrived when farms across the country are failing? Interviews with companies will focus on innovation and technology. Student researchers will schedule and conduct these interviews with supervision by a faculty member and journalist.
RESPONSIBILITIES	Student researchers will schedule and conduct these interviews with supervision by a faculty member and journalist.
REQUIREMENTS	Student will have (or learn) good email skills, interviewing, and etiquette.
OTHER IMPORTANT INFORMATION	Curiosity is the most important thing in research. You don't have to be an expert on technology to do a great job on this project!

COLLEGE OF EDUCATION

EDUCATION AND LEADERSHIP

PROJECT TITLE	Collecting Testimonios: Latine & Bilingual Student Experiences at CSU-Monterey Bay
PROJECT MENTOR	Suzanne Garcia
PROJECT CONTACT INFORMATION	sgmateus@csumb.edu
PROJECT DESCRIPTION	This qualitative research will include a call to invite participants to respond to a survey. The survey will be provided via a Google Form. Based on thematic analyses of the survey, I will select focal participants to interview them about their experiences as students in a Hispanic Serving Institution. A Hispanic Serving Institution is a university that has 25% or more students from a Latine background. The interview will be conducted on campus and with an audio recorder. The transcripts from the audio recorder will serve as data to be thematically analyzed. We are exploring the following questions, In what ways does a Hispanic Serving Institution currently support the academic and social success of Latine students? In what ways could the current methods or practices be improved upon or changed to better support students?
RESPONSIBILITIES	A UROC student will recruit participants to complete the survey by visiting instructors' classrooms. We will analyze the data and submit a conference proposal.
REQUIREMENTS	An interest in qualitative research, preferred bilingual (Spanish/English) organized, motivated to learn about research and applying for graduate school.
OTHER IMPORTANT INFORMATION	

HUMAN DEVELOPMENT AND FAMILY SCIENCE

PROJECT TITLE	Assessing Monterey County Playgrounds for Sustainability and Child Development
PROJECT MENTOR	Seth Gustafson
PROJECT CONTACT INFORMATION	sgustafson@csumb.edu
PROJECT DESCRIPTION	This interdisciplinary research project focuses primarily on sustainability, children's development, and public infrastructure by assessing the playgrounds of Monterey County. Currently, there is no single database assessing children's playgrounds in Monterey County, yet these playgrounds are vital sites for the physical and social development of the county's children. The quality, quantity, location, and preparedness for environmental change of these sites is an unknown, making it difficult for cities, non-profits, and the county to assess which playgrounds and communities need upgraded facilities. Such a database would be useful for local non-profit groups to identify areas of inequitable access across the county; advocate for necessary reforms and repairs; monitor children's play spaces for safety; prepare these spaces for adverse conditions of climate change; and more. The fundamental research question is: "Are Monterey County's playgrounds suitable for families and children in an era of environmental change?" The supervisors in this project are affiliated with the Environmental Studies program and the Human Development and Family Sciences program at CSUMB, but students beyond these programs are welcome to apply.
RESPONSIBILITIES	The UROC student researcher would be primarily responsible for identifying, visiting, and assessing playgrounds across the county. The student would also help in organizing and preparing the data for broader public use.
REQUIREMENTS	Eagerness for outdoor site visits; enthusiasm for issues related to infrastructure, environmental change, child development, or a combination of the above.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Family Matters: Policy Education and Undergraduate Attitudes
PROJECT MENTOR	Tess Shirefley
PROJECT CONTACT INFORMATION	tshirefley@csumb.edu
PROJECT DESCRIPTION	This study aims to explore the role of undergraduate education in shaping student attitudes toward federal family social policies, with a particular focus on the U.S. Family and Medical Leave Act (FMLA) and California Family Rights Act. This research study will be conducted in two parts. The first will involve a content analysis of widely used psychology and human development textbooks to assess how frequently and in what context the FMLA is presented in course materials. The second part will examine the impact of explicitly teaching about family policies—including the FMLA and CFRA—within a child development course, measuring changes in student attitudes toward federal and state support for children and families. The study aims to highlight the visibility of family policy in undergraduate developmental curriculum and the potential of policy education to influence civic understanding and interest.
RESPONSIBILITIES	Conducting a content analysis - reviewing textbook materials available and coding for how much content is included about federal family leave policies in the U.S. Survey collection from undergraduate students. Survey analysis of quantitative measures, and qualitative open-response data.
REQUIREMENTS	Interpersonal skills: dedicated, committed, collaborative, interested in psychology/human development Research skills: general interest in answering questions about human attitudes and behaviors, I am happy to teach and support any research skill development needed
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Seeing Scientists: Using Drawing to Support Student Identity in Behavioral Research Learning
PROJECT MENTOR	Tess Shirefley
PROJECT CONTACT INFORMATION	tshirefley@csumb.edu
PROJECT DESCRIPTION	This study explores the use of drawing as a reflective and identity-oriented activity in an undergraduate human development research methods course. Students will first be asked to draw a stereotypical image of a researcher, followed by a drawing of themselves as a researcher. These paired drawings will serve as a tool to examine how students perceive the identity of a researcher and whether they see themselves as fitting within that identity or not. By comparing their drawings, students will engage in reflection about representation, belonging, and their personal connection to the behavioral science fields like human development and psychology. The study will investigate whether this drawing-based intervention influences students' attitudes toward research, particularly in terms of (1) their perceived abilities in science and mathematics, (2) the value they assign to science and math in their academic and personal lives, and (3) their interest in pursuing science- and math-related learning or careers moving forward. Pre- and post-activity surveys and group discussions will be used to assess shifts in these attitudes.
RESPONSIBILITIES	Assist in providing administering surveys to students, collecting qualitative data during group discussions, coding open-responses for common themes.
REQUIREMENTS	Interpersonal skills: motivated, dedicated, collaborative, interested in behavioral science and how to improve education. Research skills: no prior experience needed, happy to support learning of research methodologies
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Young Adults' Parenting Intention
PROJECT MENTOR	Helen Fann
PROJECT CONTACT INFORMATION	hfann@csumb.edu
PROJECT DESCRIPTION	Recent survey data show nearly a quarter of Millennials and Gen Z adults report not wanting to have children. Young adults most often cite financial strain and the current sociopolitical climate as key reasons for this decision (MassMutual, 2024). Compared with older adults, young adults ages 18 to 49 are more likely to emphasize prioritizing their careers, concerns about global issues such as climate change, the high cost of childrearing, and a general lack of interest in parenting (Pew Research Center, 2024). This growing trend has prompted empirical research to further examine specific predictors of parenting intentions, including attachment style (Peltea, 2022), media exposure (Yao et al., 2025), and gender role attitudes (Sonkaya et al., 2024). Motivated by extant literature, the present study uses a mixed methods approach to better understand the factors that underlie young adults' plans to become parents. The first stage of the study, which is quantitative, was initiated in Fall 2025; we are now preparing to launch the second stage, which is qualitative, this Summer 2026.
RESPONSIBILITIES	We plan to launch the second, qualitative stage of our study. Interested undergraduate research assistants (RA) can look forward to establishing study materials (e.g., flyers, advertisements, recruitment materials) as well as aiding the PIs in conducting the focus groups and interviews needed to collect qualitative data.
REQUIREMENTS	An interest in understanding human behaviors and young adults' plans for the future, and strong interpersonal communication skills needed to conduct interviews.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	How Parents Talk to Their Children About Race: Co-Viewing and Racial Socialization When Viewing Child-directed Media
PROJECT MENTOR	Helen Fann
PROJECT CONTACT INFORMATION	hfann@csumb.edu
PROJECT DESCRIPTION	Media can be used to facilitate children's learning of abstract concepts like morals (e.g., Cingel et al., 2019); it can also prompt parent-child discussions of sensitive topics such as mental health (e.g., Cingel et al., 2021). Media has also been used as a tool for racial and ethnic socialization; a study conducted by McClain & Mares (2022) reported most parents use media as a way to expose children to diversity, though practices vary by parents' racial identity. This observational study examines how parents discuss themes of racial socialization when co-viewing child-directed media with their children. Co-viewing provides opportunities for parents to guide their children's interpretation of on-screen content and support their children's learning (McClure & Barr, 2017; Strouse et al., 2019). We focus specifically on how these discussions occurring between dyads differ across parents with varying linguistic and immigrant backgrounds.
RESPONSIBILITIES	The prospective undergraduate research assistants will be assisting in study setup, recruitment efforts (e.g., reaching out to dyads, creating advertisement materials), conducting the study in a lab space, and eventually helping with data coding and analysis.
REQUIREMENTS	Desirable skills include familiarity with audio visual equipment, strong interpersonal communication skills, and experience working with children.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Little Engineers, Big Persistence: How Robotics Shapes Problem-Solving and Persistence in Early Childhood
PROJECT MENTOR	Tess Shirefley
PROJECT CONTACT INFORMATION	tshirefley@csumb.edu
PROJECT DESCRIPTION	Join our research team exploring how young children develop persistence, problem-solving skills, and emotional regulation through hands-on robotics activities. This project investigates how preschool children (ages 3–6) respond to challenges, learn from failure, and build engineering thinking during a two-month robotics program. Undergraduate researchers will gain valuable experience in educational research by assisting with behavioral coding, data analysis, and research dissemination. This is an excellent opportunity for students interested in psychology, education, child development, engineering education, or STEM learning who want hands-on research experience and the opportunity to contribute to conference presentations and future externally funded research.
RESPONSIBILITIES	Undergraduates will meet weekly to support behavioral coding of preschooler's robotics building and emotional regulation using video data.
REQUIREMENTS	Excellent time management, openness to learning new technology (Datavyu), critical thinking, collaboration. Ideally the student will have taken a research methods course in their respective major, but this is not required.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Little Engineers, Big Persistence: How Robotics Shapes Problem-Solving and Persistence in Early Childhood
PROJECT MENTOR	Tess Shirefley
PROJECT CONTACT INFORMATION	tshirefley@csumb.edu
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REQUIREMENTS	Excellent time management, openness to learning new technology (Datavyu), critical thinking, collaboration. Ideally the student will have taken a research methods course in their respective major, but this is not required.
OTHER IMPORTANT INFORMATION	

COLLEGE OF HEALTH SCIENCES AND HUMAN SERVICES

HEALTH, HUMAN SERVICES, AND PUBLIC POLICY

KINESIOLOGY

PROJECT TITLE	"I Move For Good:" Theory-Based Interventions to Increase Physical Activity Motivation
PROJECT MENTOR	Sara Powell
PROJECT CONTACT INFORMATION	sapowell@csumb.edu
PROJECT DESCRIPTION	This project examines the existing Exercise is Medicine-OnCampus offerings. Utilizing the theories of Self Determination Theory, and Self-Efficacy Theory, students will examine the current PAL Program's ability to increase psychological skills for physical activity adherence and motivation. This project will start in summer 2025 and continue through the 2025-2026 academic year.
RESPONSIBILITIES	Students will help with the design of intervention materials, recruitment, implementation of intervention sessions, data collection, data analysis, and preparation of dissemination materials (manuscripts and posters).
REQUIREMENTS	Knowledge of the Exercise Is Medicine - On Campus program, knowledge about physical activity, Canva design, willingness to take initiative.
OTHER IMPORTANT INFORMATION	

SOCIAL WORK

COLLEGE OF SCIENCE

APPLIED ENVIRONMENTAL SCIENCE

PROJECT TITLE	Reconstructing habitat restoration activities of the Habitat Stewardship Project
PROJECT MENTOR	Seth Gustafson
PROJECT CONTACT INFORMATION	sgustafson@csumb.edu
PROJECT DESCRIPTION	For nearly 30 years, the Habitat Stewardship Project (HSP, also formerly known as the Return of the Natives) has worked to include communities on the central coast in habitat restoration in Salinas, Fort Ord, Seaside, Marina, and many more. Records of these years of extensive habitat restoration, however, are not systematically organized. A database of these activities would lay the groundwork for future HSP activities, including environmental assessments, narrative writing, site visits, grant proposals, and more. The main outcome of this UROC opportunity is the creation of this database and the guiding research question is: "Where, when, how, and with whom has the HSP restored central coast landscapes?" This project could be appealing to a student with a range of interests, so please apply even if your interests don't perfectly align!
RESPONSIBILITIES	The student's role would be 1) collecting and analyzing documents, 2) interviewing HSP members/participants, and 3) creating a database (perhaps creating spatial data for GIS applications)
REQUIREMENTS	Strong organizational skills; possible interests include: qualitative research with archives and interviews, environmental issues/themes, community research, GIS
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Assessing Monterey County Playgrounds for Sustainability and Child Development
PROJECT MENTOR	Seth Gustafson
PROJECT CONTACT INFORMATION	sgustafson@csumb.edu
PROJECT DESCRIPTION	This interdisciplinary research project focuses primarily on sustainability, children's development, and public infrastructure by assessing the playgrounds of Monterey County. Currently, there is no single database assessing children's playgrounds in Monterey County, yet these playgrounds are vital sites for the physical and social development of the county's children. The quality, quantity, location, and preparedness for environmental change of these sites is an unknown, making it difficult for cities, non-profits, and the county, to assess which playgrounds and communities need upgraded facilities. Such a database would be useful for local non-profit groups to identify areas of inequitable access across the county; advocate for necessary reforms and repairs; monitor children's play spaces for safety; prepare these spaces for adverse conditions of climate change; and more. The fundamental research question is: "Are Monterey County's playgrounds suitable for families and children in an era of environmental change?" The supervisors in this project are affiliated with the Environmental Studies program and the Human Development and Family Sciences program at CSUMB, but students beyond these programs are welcome to apply.
RESPONSIBILITIES	The UROC student researcher would be primarily responsible for identifying, visiting, and assessing playgrounds across the county. The student would also help in organizing and preparing the data for broader public use.
REQUIREMENTS	Eagerness for outdoor site visits; enthusiasm for issues related to infrastructure, environmental change, child development, or a combination of the above.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Wildlife presence in wetlands adjacent to agriculture. Does this pose a food safety hazard?
PROJECT MENTOR	Rebecca Roberts Monterey Bay National Marine Sanctuary
PROJECT CONTACT INFORMATION	rebecca@californiamsf.org
PROJECT DESCRIPTION	Natural structures such as vegetated ditches and wetlands can remove many of the agricultural pollutants (nutrients, pesticides and sediment) from ag runoff that are causing substantial water quality issues in our central CA coast region. Growers want to adopt these practices to help with regulatory compliance, however are reluctant due to concerns that natural habitat may attract rodents, birds and other species. These species pose food safety risks, as they can carry human pathogens into the crop. The California Marine Sanctuary Foundation is working with CSUMB to develop a scientific understanding of the level of food safety risk posed by the presence of wetland vegetation adjacent to cropping systems. We know growers will be more likely to implement vegetation to improve water quality if they understand the risks and how to manage them. Join our collaboration to help us trap small rodents in wetlands and test practices for preventing their movement into the field. This is a terrific opportunity to learn how to do field work in an agricultural setting. The work you accomplish will make a difference to agriculture and to the Monterey Bay National Marine Sanctuary.
RESPONSIBILITIES	The student will assess wildlife presence of small mammals, amphibians, and reptiles near wetlands adjacent to agricultural crop fields. The student will be responsible for being on a team that will trap rodents in wetlands and look for evidence of other small mammals like rabbits and ground squirrels. The student will also help install fencing or some other management practice to deter movement into the field. The student will research what species carry different human pathogens and pose the highest risk. The student will develop a paper or power point presentation that can be used to explain food safety risks and conservation values of vegetated ditches and wetlands to growers and the ag industry.
REQUIREMENTS	Ability to learn! We will teach you most of what you need to know. Most importantly you will need to be reliable and available to work on the project, be disciplined in caring for equipment, and be determined to get the job done. Having a car is a plus.
OTHER IMPORTANT INFORMATION	Must be willing to handle rodents (with the proper safety equipment and precautions). May need to work on weekends and early mornings. Must be professional when talking with growers and other farm people.

PROJECT TITLE	Ventana Wildlife Society: Managing the Central CA population of critically endangered California Condors with Pinnacles National Park.
PROJECT MENTOR	Ventana Wildlife
PROJECT CONTACT INFORMATION	Danae Mouton danaemouton@ventanaws.org
PROJECT DESCRIPTION	Ventana Wildlife Society (VWS) co-manages the Central CA population of critically endangered California Condors with Pinnacles National Park. Part of this intensive management involves placing supplemental carcasses at feeding sites throughout Big Sur, California. Remote video cameras and game cameras are deployed at each bait site, and this footage is analyzed to document condor presence and behavior at each location. The student involved in this project will help place carcasses at bait sites as well as analyze remote camera footage to document behavior related to courtship, breeding, feeding, socializing, and dominance for individual birds, as well as presence and abundance of Condors over time
RESPONSIBILITIES	The student on this project will assist with placing frozen calf carcasses at bait sites in Big Sur during the day and at night and assist with trail camera setup and maintenance. They will also have the opportunity to assist in transporting calf carcasses from dairies in Petaluma for this purpose. The student will review both still and video remote camera footage and will identify individual condors and document their observed behavior at each feeding location (behaviors include courtship/breeding, feeding, dominance, and social behavior). The student also has the opportunity to create time activity budgets for individual condors, as well as analyze the relationship between condor feeding activity and factors such as site location and condor age and sex. All data will be recorded according to rigorous protocols and entered into a centralized database by the student. Based on student's interest, there is the potential for up to one overnight visit to a remote field site per week (camping or rustic cabin accommodations provided) which includes the opportunity for in-person observations of condors.
REQUIREMENTS	Personal vehicle preferred (for transportation to Monterey office) but not required for field work. Students would be meeting at Ventana Wildlife Society's Main office (Ryan Ranch Monterey, CA), or at our field trucks location (Munras Ave Monterey, CA) and traveling to Petaluma, CA or Big Sur, CA- accompanied by a biologist at all times. Students could travel to Petaluma, CA once a month and Big Sur, CA once a week. Statistics: Basic summary statistics will be used to analyze condor data

	collected Computer Skills: Analyze video and camera footage to curate condor behavior, then enter data into a centralized database Field work: Willingness to be in the field desired, but minimal prior experience required. Training on field tasks will be provided Taxonomic ID (and individual condor ID): Will be trained to identify CA condors and read vinyl ID tags to recognize individuals Willingness to travel: Would join for overnight trips to our remote field site in Big Sur (3 hours each way) and for day-long trips to Petaluma (approx. 4 hours each way). Other: Willingness to handle dead animals: will lift calf carcasses with another person, process to make sure they are safe to place for condor consumption, and drag to feed locations Other: Willingness to handle and move heavy objects: With another person, will lift calf carcasses, weighing > 50 lbs, from chest freezers and into and out of trucks. Will also drag carcasses short distances to feeding locations. The student will need to be in good physical condition and have the ability to hike steep rugged terrain. While assistance will be provided, this position will require the ability to safely lift and move carcasses in excess of 50-75 pounds. We also note that the ability to handle rotten carcasses (not for the squeamish) is necessary. We are looking for a self-motivated student who can commit at least two days a week and a minimum of 10 hrs total per week.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Central Coast Black Oystercatcher Monitoring Project
PROJECT MENTOR	Monterey Audubon Society
PROJECT CONTACT INFORMATION	montereyaudubon@gmail.com
PROJECT DESCRIPTION	The intern in our program will be out in the field with the Black Oystercatcher (BLOY) monitoring program staff for most days, observing oystercatcher behavior to determine the status of the oystercatcher nests we monitor around the Monterey Peninsula. The BLOY is a Species of Special Concern in California, and their reoccurring nesting failure is what we will be exploring. These nesting birds have been monitored since 2011, and this large dataset will be a crucial part of our research efforts to understand the main causes of nest failure. All nest monitoring is conducted from a distance to reduce disturbance to the birds, so the intern will be issued binoculars and a spotting scope and instructed on how to use them. While in the field, the intern will also interact with the public by answering questions and distributing educational material such as brochures. Time will be set aside each week to meet with the Audubon mentor/PI, who will check in with the intern about how they feel the internship is going and work together to clean up data, develop hypotheses, and dig into statistical analysis. We will be combining multiple large datasets from the BLOY monitoring project, rocky intertidal biodiversity data from UCSC, and MPA Watch data related to human recreational use of the coastline. **Please note, this position will be paid by the Monterey Audubon Society's Whale Tail Grant from the CA Coastal Commission. Researchers will be paid \$17 per hour. The goal of this grant and project is to recruit and pay an intern from the local Latinx student community at CSUMB to assist with monitoring nesting Black Oystercatchers in the Monterey Bay region, allowing them to forge a meaningful connection to the coast and develop skills that will help them excel in their chosen field of study within STEM. We hope that this grant will provide a crucial opportunity to minimize barriers to entering the conservation field by interested students from the Latinx community.
RESPONSIBILITIES	Responsibilities of the intern include but are not limited to: Field Work Responsibilities • Work with the MAS BLOY Project staff and volunteers monitoring Black Oystercatcher nests on the rocky coastlines of Monterey Bay • Enter data into spreadsheets, make recommendations, and analyze data as assigned

	Research Responsibilities • Work with project staff organizing pre-existing data related to rocky intertidal habitat health and public use of the coastline for use in analysis • Format existing BLOY data for use with other datasets • Develop hypotheses to test through model analysis Education and Outreach Responsibilities • Engage and educate the public while out conducting field work • Present research findings at the UROC Summer Symposium and present to the Monterey Audubon • Society members at the Pacific Grove Museum of Natural History
REQUIREMENTS	Student must have their own transportation Significant Experience Required, supervision will be provided: • Statistics • Statistical Modeling • Computer Skills (R & Excel) • Programming (Running statistical models in R or Python) Some Experience Expected, some training will be provided • GIS (Arc) • Willingness to travel • Experience talking to public
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Fog Water Collection - Field work and analysis
PROJECT MENTOR	Dan Fernandez
PROJECT CONTACT INFORMATION	dfernandez@csumb.edu
PROJECT DESCRIPTION	We will primarily be examining data on fog water collection that we have gathered over many years throughout locations in California. However, some work will also occur to service some of the existing systems.
RESPONSIBILITIES	Data analysis, use of R and Excel, preparation of graphs and images, some field/lab work as well.
REQUIREMENTS	Strong work ethic, ability and willingness to both analyze data and generate graphs in R or excel. Ability or willingness to use tools to fabricate fog collectors.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Fog Research
PROJECT MENTOR	Dan Fernandez
PROJECT CONTACT INFORMATION	dfernandez@csumb.edu
PROJECT DESCRIPTION	Analysis of data from local and regional fog collectors in conjunction with meteorological data.
RESPONSIBILITIES	Instrument fabrication, deployment, and data analysis
REQUIREMENTS	R, excel, hands on fabrication
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Assessing and Communicating Dormitory Water and Electricity Use
PROJECT MENTOR	Seth Gustafson
PROJECT CONTACT INFORMATION	sgustafson@csumb.edu
PROJECT DESCRIPTION	This project seeks to develop effective ways of communicating and monitoring dormitory water and electricity use at CSUMB. Because CSUMB students do not see their utility use or pay a monthly bill, consumption rates are often unknown to most students. This is a problem for encouraging sustainable and judicious utility use, especially for a student body that is eco-conscious and motivated toward environmental good.
RESPONSIBILITIES	Researching and developing communication strategies related to utility use, collecting and displaying utility information, creating surveys for student questionnaires
REQUIREMENTS	Eagerness to learn, interest in sustainability
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Living Community Challenge and Campus Nature Rx
PROJECT MENTOR	Victoria Derr
PROJECT CONTACT INFORMATION	vderr@csumb.edu
PROJECT DESCRIPTION	This research is focused on compiling existing photovoice data from three years of Environmental Studies research methods coursework as well as collecting new data to support the reporting and promotion of CSUMB's Living Community Challenge and its related Campus Nature Rx programming. The research question, broadly, is who and how is the campus promoting health, well-being, and a sense of belonging through biophilic design and promotion of Nature Rx? and How can Nature Rx be more accessible to CSUMB's campus and students?
RESPONSIBILITIES	Students will: i) compile and analyze photovoice data and support generation of a report for campus planning; ii) conduct short interviews to compile a set of "Nature Rx Champions" and interviews with campus student affinity groups to identify opportunities and barriers to Nature Rx; and iii) conduct literature reviews. Photovoice and literature reviews will also inform recommendations for better integrating Campus Nature Rx across the campus.
REQUIREMENTS	Familiarity with photographic research and interviews; ability to follow detailed instructions and to utilize spreadsheet; interest in and familiarity with concepts such as biophilic design and Nature Rx.
OTHER IMPORTANT INFORMATION	This is a long term process of university engagement that is embedded into policies and plans of the university, and that campus staff and faculty are actively working on improving. The research will have direct benefits to the campus and students.

PROJECT TITLE	Provenance of Beach Sands in Monterey Bay: Sediment Sources, Littoral Connectivity, and Canyon Exchange
PROJECT MENTOR	Ivano Aiello
PROJECT CONTACT INFORMATION	ivano.aiello@sjsu.edu MLML
PROJECT DESCRIPTION	This project investigates the provenance of beach sands in Monterey Bay to evaluate sediment sources, littoral-cell connectivity, and potential sediment exchange across Monterey Canyon. The central research question is whether sands found along different sectors of the bay—including Moss Landing and areas near the canyon head—can be linked to distinct sources such as the Salinas River, Pajaro River, or erosion of southern Monterey Bay dunes. The UROC student will participate in field sampling along the Santa Cruz–Monterey coastline, laboratory analyses (grain size and XRF/pXRF geochemistry), and data interpretation using statistical approaches to compare sediment signatures across sites.
RESPONSIBILITIES	The student will conduct beach sediment sampling at both local and regional scales, assist with sample preparation, perform grain-size analyses, and carry out XRF/pXRF measurements. They will organize datasets, produce basic plots and maps, and apply introductory statistical methods to compare sediment compositions. The student will also read and synthesize relevant literature on watershed geology and sediment transport, and contribute to a short written report and figures summarizing results.
REQUIREMENTS	Interest in oceanography, geology, or environmental science; willingness to participate in fieldwork under variable coastal conditions; basic quantitative and organizational skills (e.g., Excel); attention to detail in laboratory work; ability to work both independently and as part of a team. Prior coursework in Earth or environmental science is helpful but not required.
OTHER IMPORTANT INFORMATION	The project is structured over 10 weeks, with the first half focused on field sampling and laboratory analyses, and the second half on data analysis and writing. The student will work closely with graduate students and gain exposure to an active research environment, including lab meetings and collaborative interpretation of results. The project provides hands-on experience in sedimentology, geochemical analysis, and coastal process interpretation.

BIOLOGY, AGRICULTURE AND CHEMISTRY

PROJECT TITLE	Synthesis of novel metal oxides for energy and agriculture related applications
PROJECT MENTOR	Roshini Ramachandran
PROJECT CONTACT INFORMATION	rramachandran@csUMB.edu
PROJECT DESCRIPTION	We are interested in synthesizing a variety of metal oxide and boron oxide materials with new surface structures and properties for application in energy storage and agriculture. We will explore how different reaction conditions (temperature, pH, starting materials, reagents etc.) will influence the structure and composition of the product formed. We will also be using advanced instrumentation to test the physical properties of the materials we made - some have interesting properties such as changing color when electricity is passed through them!
RESPONSIBILITIES	Performing inorganic chemistry experiments in the lab, reading literature related to them, testing physical properties of the materials made
REQUIREMENTS	Has taken CHEM 110/CHEM 110L or equivalent intro chemistry lab course
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Synthesis of metal oxides for energy applications
PROJECT MENTOR	Roshini Ramachandran
PROJECT CONTACT INFORMATION	rramachandran@csumb.edu
PROJECT DESCRIPTION	We use inorganic chemistry and nanotechnology to make novel metal oxide materials that have interesting surface structures. We use precipitation chemistry techniques coupled with nanoscience to control the size and shape of metal oxides, so that we can alter their properties favorably. The materials we make have cool properties (e.g. color changing) that aim to solve current issues in energy, efficiency, and imaging.
RESPONSIBILITIES	Reading literature, performing chemistry precipitation reactions, using instrumental techniques to identify chemical compounds
REQUIREMENTS	Basic general chemistry knowledge (CHEM 110) and laboratory skills (CHEM 110L)
OTHER IMPORTANT INFORMATION	What I expect from you: • Interest in learning something new! • Willingness to go outside your comfort zone and try new techniques • Knowledge of basic mathematical & chemistry calculations (CHEM 110). • Ability to perform lab work safely (CHEM 110L). • Commitment of 2-3 hours per week. What you can expect from me: • Dedicated one-on-one mentorship • Full guidance in experimental and analytical techniques • Support to advance your academic & career interests

PROJECT TITLE	Assessing Climate Smart Nutrient Management Practices for Reductions of In-Field Nitrogen Losses
PROJECT MENTOR	Stefanie Kortman
PROJECT CONTACT INFORMATION	skortman@csumb.edu
PROJECT DESCRIPTION	The Haffa Laboratory of Agricultural Biogeochemistry (LAB) is working with a Salinas Valley agriculture company to seeking to determine the potential of climate smart nutrient management (CSNM) practices to sustain specialty crop yields while reducing environmental impacts of nitrogen discharge as greenhouse gas emissions and nitrate and sequestering soil carbon This project will increase the understanding of climate smart nutrient management for specialty crop producers and multiple other stakeholders. We are seeking a Sustainable Nutrient and Irrigation Management student research liaison to support a field trial in partnership with Huntington Farms. This student would help with on-farm measurements of soil gas emissions, and soil sampling and lab processing. Additionally, the student would have the opportunity to learn and conduct sustainability reporting and greenhouse gas tracking for on-farm trials.
RESPONSIBILITIES	The student will be responsible for participating in field measurements of soil gas emissions, collecting soil samples, and processing soil in the laboratory. The student will also be expected to participate in bi-weekly lab meetings to review and discuss literature and resources related to the research topic to enhance their understanding of the work.
REQUIREMENTS	The student should have a current driver's license and be willing to complete the University Defensive Driving to drive research trucks. They should be able to lift up to 50 pounds and navigate around a farm field for up to a few hours, and work both under supervision and independently with great attention to detail and accuracy. Excellent communication skills are important. Proficiency in Google applications and Excel are helpful, and any experience in R is a plus (but not necessary).
OTHER IMPORTANT INFORMATION	The technical and practical skills gained through this experience are transferable to many other applications.

PROJECT TITLE	Scaling Up Climate Smart Nutrient Management in Cool-season Specialty Crop Production
PROJECT MENTOR	Stefanie Kortman
PROJECT CONTACT INFORMATION	skortman@csumb.edu
PROJECT DESCRIPTION	The Haffa Laboratory of Agricultural Biogeochemistry (LAB) investigates how agricultural management practices can improve both crop productivity and environmental sustainability. This project focuses on climate-smart nutrient and irrigation management strategies that maintain crop yields while reducing greenhouse gas emissions, minimizing nitrate losses to groundwater, and enhancing soil carbon storage. The research also evaluates how these management practices perform across commercial farming operations and under changing climate conditions to support their adoption by growers and land managers. The UROC student will play an active role in ongoing field and laboratory research. Students will participate in collecting soil and environmental data from working agricultural fields, processing and analyzing samples in the laboratory, and contributing to data management and interpretation. Through these activities, students will gain hands-on experience in agricultural biogeochemistry, soil science, environmental monitoring, and applied sustainability while contributing to research that addresses critical challenges in climate-resilient agriculture.
RESPONSIBILITIES	Responsibilities will include collecting soil samples, measuring soil greenhouse gas emissions in agricultural fields, processing soil samples in the laboratory through different methods and using analytical instruments, and maintaining accurate records of field and laboratory data. The student may also assist with data entry, basic data analysis, literature review, and sustainability reporting related to greenhouse gas accounting. Students will have opportunities to work both independently and collaboratively with students, faculty, and research staff while gaining experience with field instrumentation, laboratory techniques, and scientific data management.
REQUIREMENTS	Preferred qualifications include a valid driver's license, the ability to lift up to 50 pounds and work safely outdoors under a range of agricultural field conditions, and a willingness to work both independently and collaboratively as part of a research team. Strong organizational and communication skills are desirable, along with an interest in agriculture, environmental science, soil science, or sustainability. Experience with field or laboratory research is beneficial but not required, as training will be provided. Spanish language proficiency is a plus, but not necessary.
OTHER IMPORTANT INFORMATION	

COMPUTING AND DESIGN

PROJECT TITLE	Utilizing Gamification & Interactive Technologies to Improve Learning
PROJECT MENTOR	Amir Attia
PROJECT CONTACT INFORMATION	aattia@csumb.edu
PROJECT DESCRIPTION	Examine interactive game design approaches to communicate early age STEM curriculums and environmental health topics to improve children's learning skills and mental health. Stimulate and engage communication and Visual Design students' in multi-disciplinary projects to address problems related to creating and developing interactive game and User Interface (UI) designs for early age STEM education.
RESPONSIBILITIES	• Administer surveys for middle school teachers and students. • Help with identifying the challenging STEM and environmental science concepts/topics that can be gamified. • Help in coding and developing the apps.
REQUIREMENTS	Conducting surveys, coding for iOS and/or Android
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Large Language Model for Complex Reasoning Task: An Exploratory Study in Fermi Question
PROJECT MENTOR	Dongji Feng
PROJECT CONTACT INFORMATION	dfeng@csumb.edu
PROJECT DESCRIPTION	Fermi Problems (FPs) are mathematical reasoning tasks that require human-like logic and numerical reasoning. Unlike other reasoning questions, FPs often involve real-world impracticalities or ambiguous concepts, making them challenging even for humans to solve. Despite advancements in AI, particularly with large language models (LLMs) in various reasoning tasks, FPs remain relatively under-explored. This work conducted an exploratory study to examine the capabilities and limitations of LLMs in solving FPs. CSUMB students will have the opportunity to participate in a collaborative research project with partner institutions to develop a multi-modal Fermi problem benchmark. This initiative will include dataset construction, LLM performance evaluation, and fine-tuning experiments, and scholarly paper publication.
RESPONSIBILITIES	Include but not limited to : Assist in collecting, cleaning, and organizing datasets for multi-modal Fermi problem benchmarks. Conduct literature reviews on large language model (LLM) evaluation and fine-tuning methods. Support design and implementation of experiments to assess LLM performance on reasoning tasks. Contribute to data annotation and documentation to ensure dataset quality and reproducibility. Collaborate with faculty and partner institutions in research meetings and progress reports. Help with analyzing experimental results and summarizing key findings. Participate in drafting research papers, figures, and presentations for publication and conferences. Maintain clear and organized records of research activities, code, and data versions. Prepare and present weekly or bi-weekly progress reports during team meetings.
REQUIREMENTS	Basic knowledge of Python programming and familiarity with common data science libraries (e.g., NumPy, pandas, PyTorch, TensorFlow, or similar). Strong interest in artificial intelligence, machine learning, or natural language processing (NLP). Ability to analyze and interpret data, and willingness to learn new research methods and tools. Commitment to attend weekly or bi-weekly meetings and provide consistent progress updates.
OTHER IMPORTANT INFORMATION	AI / ML prior experience is not required, as training will be provided

PROJECT TITLE	NutritionBench: A Benchmark for Evaluating LLMs on Healthcare Nutrition Tasks
PROJECT MENTOR	Dongji Feng
PROJECT CONTACT INFORMATION	dfeng@csumb.edu
PROJECT DESCRIPTION	This research project focuses on developing a novel benchmark to evaluate the capabilities of large language models (LLMs) and multimodal AI systems in healthcare-related nutrition tasks. As AI systems are increasingly used in health and wellness applications, it is critical to assess their ability to accurately recognize food items, understand nutritional information, and reason about diet-related questions. The central research question of this project is: How well can modern AI systems (including LLMs and multimodal models) understand, interpret, and reason about food and nutrition information from images and text? To address this question, the project will develop and evaluate two core tasks: 1 - Food Classification Task: Students will work with food image datasets to build and evaluate models that classify and identify food items. Additional attributes such as packaging and processing level may also be incorporated to enrich the prediction task. 2 - Nutrition Question Answering Task: This task will involve answering nutrition-related questions based on one or more food images. The goal is to assess the reasoning ability and domain knowledge of AI systems in realistic, health-related scenarios.
RESPONSIBILITIES	Students will participant the core parts including: 1) Data analysis and preparation: Exploring and organizing food image and nutrition datasets. 2) Methodology implementation: Running and testing different LLMs and multimodal models on benchmark tasks. 3) Evaluation and metrics design: Developing criteria to measure model performance and reliability. 4) Result analysis: Interpreting findings and comparing model capabilities across tasks. 5) Collaborative research meetings: Participating in joint meetings with collaborating institutions and contributing to research discussions
REQUIREMENTS	Basic knowledge of Python programming and familiarity with common data science libraries (e.g., NumPy, pandas, PyTorch, TensorFlow, or similar). Strong interest in artificial intelligence, machine learning, LLM

	Ability to analyze and interpret data, and willingness to learn new research methods and tools. Commitment to attend weekly or bi-weekly meetings and provide consistent progress updates.
OTHER IMPORTANT INFORMATION	We are looking for motivated undergraduate students who are interested in AI, data science, and healthcare applications. Ideal candidates should demonstrate: 1) Strong work ethic and commitment to completing research tasks on time 2) Discipline and reliability in managing responsibilities and meeting deadlines 3) Willingness to learn new tools and concepts in machine learning and AI 4) Attention to detail in data analysis and evaluation 5) Critical thinking skills for interpreting results and identifying limitations 6) Ability to work independently and collaboratively in a research team 7) Effective communication skills for participating in meetings and presenting findings

PROJECT TITLE	Draculog: Measuring Climate Impact of Computing
PROJECT MENTOR	Joshua Gross
PROJECT CONTACT INFORMATION	jgross@csumb.edu
PROJECT DESCRIPTION	This project focuses on software to help students understand performance in computation based on energy use and climate impact (CO2 produced), rather than just time. The purpose of this research is to help students and researchers better understand measures of efficiency within computation, and to offer students a real-world understanding of efficiency.
RESPONSIBILITIES	Students will develop web software, server software, and educational content
REQUIREMENTS	Programming (ideally having completed a data structures course), writing/documentation, and/or data analysis (experience with statistics)
OTHER IMPORTANT INFORMATION	Students contribute to the common software for the project, and also work to carve a project based on their own interests

PROJECT TITLE	Learning from Online CS Program Data: Evidence-Based Pathways for Computing Education Research, Student Success, and Program Visibility
PROJECT MENTOR	Dongji Feng
PROJECT CONTACT INFORMATION	dfeng@csumb.edu
PROJECT DESCRIPTION	SCD has accumulated multiple years of data from its online degree program, including enrollment patterns, student demographics, course performance, learning management system activity, advising records, course sequencing, retention, graduation, and possibly career outcome data. These data represent a valuable but underused asset for improving student outcomes, advancing computing education research, and communicating the strengths of the program to prospective students and stakeholders. This proposal outlines a systematic plan to organize, analyze, and use these data through a department-level learning analytics and computing education research initiative. The project will pursue three connected goals: 1) Conduct research in computing education, especially around online CS learning pathways, course bottlenecks, equity, and student persistence. 2) Improve student success through early-alert models, course redesign, advising support, and evidence-based interventions, and develop an ethical, AI-supported learning analytics framework. 3) Enhance SCD online program outreach and promotion by leveraging validated and aggregated evidence regarding student development pathways, outcomes and program strength. The proposed work will begin with a data inventory and governance plan, followed by descriptive analytics, predictive modeling, intervention design, and evaluation. The long-term outcome will be a sustainable data-informed improvement cycle for the SCD online program.
RESPONSIBILITIES	Include but not limited to : Assist in collecting, cleaning, and organizing datasets. Conduct literature reviews. Support design and implementation of experiments. Maintain clear and organized records of research activities, code, and data versions. Prepare and present weekly or bi-weekly progress reports during team meetings.
REQUIREMENTS	Basic knowledge of Python programming and familiarity with common data science libraries (e.g., NumPy, pandas, PyTorch, TensorFlow, or similar).

	Strong interest in artificial intelligence, machine learning, or natural language processing (NLP). Ability to analyze and interpret data, and willingness to learn new research methods and tools. Commitment to attend weekly or bi-weekly meetings and provide consistent progress updates.
OTHER IMPORTANT INFORMATION	We have three ultimate goals in this work: Goal 1: Advance Computing Education Research Use multi-year online CS program data to study student learning, persistence, equity, and course progression in an online computing environment (research paper). Goal 2: Enhance Student Success Develop evidence-based advising, early-alert, and course-redesign strategies that improve retention, course completion, graduation, and student confidence. One outcome of this goal is an AI-supported learning analytics framework which can help in the faculty teaching process (Can be a research/application paper). Goal 3: Support Program Advertising and Outreach Use verified aggregate outcomes, student pathway evidence, capstone examples, and alumni success stories to communicate the value of the online CS program.

MARINE SCIENCE

PROJECT TITLE	Pismo Clams and their Geological Habitat
PROJECT MENTOR	Olivia Beaudoin Moss Landing Marine Laboratories
PROJECT CONTACT INFORMATION	obeaudoin@csUMB.edu
PROJECT DESCRIPTION	The Pismo clam (<i>Tivela stultorum</i>) was once a strong commercial asset to the fishing industry along the California coast, until a decline in their population sizes due to their exploitation in the 1990s. This proposed project explores how distributions, abundances, and ages of Pismo clam populations are potentially dictated by the sedimentary habitat of Monterey Bay. The results of this study will provide an understanding of what geological habitat conditions are best fit to maintain, or reestablish, populations of Pismo clams in Monterey Bay. The main objectives of this project are listed below: • Evaluate the mean sediment grain size that results in the highest abundance of Pismo clams in Monterey Bay. • Gather full profiles of sediment size to estimate what degree of sorting is best correlated with the highest abundance of Pismo clams in Monterey Bay. • Estimate the beach slope of each transect to understand what beach slope is best fit to contain the highest abundance of Pismo clams in Monterey Bay. • Define population age structures of Pismo clams within Monterey Bay and compare these age structures with sedimentary habitat characteristics. These objectives will be achieved through sampling the sandy beach coastline at a number of sites within Monterey Bay. Sampling will include running a number perpendicular transects by digging roughly 30 meter long trenches at a width and depth of one shovel head. The transect is broken up into three meter increments, where the sand is shoveled into a Gorilla cart and pulled into the water to sieve for clams. Sediment will be gathered at the start of each three meter increment. As you can imagine this will require a significant number of hands to complete. I would expect students to participate in these digs and learn about all the roles they must play to make sure our collection runs smoothly. Luckily, all students who have shown interest in this project have already volunteered and attended training sessions for our field collection methods. I would expect students to become familiar with littoral sediment transport, beach interface dynamics, Pismo clam population histories of Monterey Bay, and physical oceanographic dynamics. With

	permission, I would also expect students to be trained in the use of the Beckman Coulter LS Particle Analyzer so sediment samples can be processed
RESPONSIBILITIES	Reading literature, particle sizing, sandy beach transects, establishing burial rate indices, sampling at early mornings. • Students will be required to dig 30 meter transects into the surf and sieve them (a group effort). These will most likely be done in any condition. Shoveling wet sand will require good physical health. • Students will also be required to identify and count individual clams and mark individuals for recapture. • Students will collect and maintain sediment samples. • Students will also have to read and analyze previous literature and historical data.
REQUIREMENTS	Willingness to learn, leadership, enthusiasm, some field experience, communicative • A willingness to learn, enthusiasm. • Ability to conduct research in the early hours of the morning at times. • Flexibility with tidal schedules. • Experience reading scientific literature. • Some experience with data analysis (can just be from a general biology or elective class). • Good physical health.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Exploring hidden diversity: ecological and evolutionary insights into marine Rickettsiales
PROJECT MENTOR	Lydia Baker
PROJECT CONTACT INFORMATION	lybaker@csumb.edu
PROJECT DESCRIPTION	Bacterial parasites, particularly those from the genus Rickettsiales, are well-known in terrestrial systems but are often overlooked in marine environments until they cause significant harm. One group, Aquarickettsia, has been detected during extensive research into coral microbiomes, where it has been linked to dysbiosis, reduced growth, and increased mortality in hosts, especially under stress from climate change and pollution. Beyond corals, Rickettsiales are present across a wide range of marine ecosystems and organisms, as suggested by the Earth Microbiome Project and other genomic databases. However, much remains unknown about their evolutionary trajectory, their transition from terrestrial to marine environments, and their ecological impact on marine ecosystems. This project will explore existing datasets and genomic resources to better understand the evolution, diversity, and ecological consequences of Rickettsiales infections in marine ecosystems, and how these bacteria might respond to climate change. Students working on this project will primarily engage in computational and data analysis tasks. They will explore large-scale publicly available genomic and environmental datasets to 1) Identify evolutionary patterns in marine Rickettsiales 2) Analyze how these bacteria interact with different marine hosts and ecosystems 3) How environmental factors may be influencing the symbionts evolution and ecology.
RESPONSIBILITIES	Students will receive training in bioinformatics, including the use of tools like R and Python, and will gain experience working with complex datasets. No prior lab experience is required, as this project focuses entirely on data-driven research. Students will also have opportunities to present their work at conferences and apply for relevant research grants.
REQUIREMENTS	Candidates would benefit from having experience showing attention to detail, the ability to stay focused on tasks despite a learning curve, and a basic familiarity with computational tools like R. Students who have previous experience in other languages (bash, python, etc) a plus.
OTHER IMPORTANT INFORMATION	There will be no wet lab work in this project, and students will focus on data analysis and interpretation. However, this means that working hours are more flexible, with opportunities to work remotely.

PROJECT TITLE	Functional dynamics and climate change vulnerability of the gut microbiome of omnivorous sharks
PROJECT MENTOR	Lydia Baker
PROJECT CONTACT INFORMATION	lybaker@csumb.edu
PROJECT DESCRIPTION	This project explores the gut microbiome of bonnethead sharks (<i>Sphyrna tiburo</i>), one of the only confirmed omnivorous shark species, to uncover critical links between their unique diet, microbial communities, and environmental impact. As bonnetheads eat both seagrass and algae, exploration of their microbiome relative to a similarly sized carnivorous species will inform how this species and their ecosystem is impacted by a changing environment. To achieve this, the project will evaluate how factors like life stage, sex, nutritional condition, and environmental stressors affect the gut microbiome and how these changes may influence the sharks' health and resilience. By leveraging a combination of field sampling, molecular analysis, and bioinformatics, the research aims to identify key microbial taxa and develop microbiome-based biomarkers that could serve as early indicators of ecosystem health and degradation.
RESPONSIBILITIES	The UROC student will receive funding to attend a week-long training course in Miami, FL, where they will gain hands-on experience in animal handling, sterile sample collection, and other essential field methods. During this time, the student will be living in shared, tight-quarters housing with the research team. Following this training, the student will work as part of a research team to extract DNA from samples and prepare them for metagenomic sequencing. In the second year of the project, the student will analyze sequencing data and contribute to data interpretation. Their work will culminate in a research presentation at UROC and a coding tutorial shared with collaborators in year 2.
REQUIREMENTS	Students with prior experience in coding, R analysis, and/or molecular techniques will be preferred, but no prior experience with animal handling needed.
OTHER IMPORTANT INFORMATION	This opportunity is not restricted to those in the Marine Science Dept. Any applicant will be expected to commit to two years of working in my lab and with UROC.

PROJECT TITLE	Brine-Dominated Hydrothermal Vents: Megafaunal Community Structure and Dynamics along the Cleft Segment of the Juan de Luca Ridge
PROJECT MENTOR	Ilaria Bardini Moss Landing Marine Laboratories (MLML)
PROJECT CONTACT INFORMATION	ilaria.bardini@sjsu.edu
PROJECT DESCRIPTION	This project investigates megafaunal community dynamics and ecological succession at hydrothermal vents along the Cleft Segment of the Juan de Fuca Ridge. Unlike typical vent systems, vents in this region release long-lived, brine-dominated fluids with unique chemical profiles such as low oxygen, high chlorinity, and elevated metals that may limit diversity and favor specialized species. Due to the last eruption occurring in 1986 and the prolonged venting period, little is known about how these conditions influence megafaunal succession and spatial community structure. Using ROV video transects and biological sampling collected in 2024, this study will analyze how abundance, diversity, and composition of megafauna change with distance from vent sites and explore fine-scale patterns across vent structures. Here are the objectives for this project: O1: To quantify and analyze the spatial distribution, community composition, diversity and community complexity of megafauna along the Cleft Segment of the Juan de Fuca Ridge as distance from brine-dominated vents increases. O2: To explore fine-scale spatial community structure on the vents themselves to address variation in community composition across smaller scales.
RESPONSIBILITIES	1. Assist in the review and analysis of ROV video footage from the Cleft Segment, gaining experience in identifying species and ecological patterns at hydrothermal vent sites 2. Become familiar with BIIGLE, a video and image annotation software 3. Aid in the development of a comprehensive ID Guide of that region 4. Work directly with preserved biological deep-sea samples, assisting with sorting, preliminary taxonomic ID, and counting of various deep-sea invertebrate species
REQUIREMENTS	A eagerness to learn and an interest in deep-sea ecology!
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Strategic Survivors: How Foraging Decisions Shape Longevity in Female Northern Elephant Seals
PROJECT MENTOR	Sebastian Caamano Moss Landing Marine Laboratories (MLML)
PROJECT CONTACT INFORMATION	sebastian.caamano@sjsu.edu
PROJECT DESCRIPTION	Foraging is critical to survival, particularly in long-lived species such as the northern elephant seal. Individuals that consistently adopt effective foraging strategies, maximizing energy intake while minimizing risk, are more likely to survive and reproduce successfully. However, not all strategies are equal; behaviors that yield high energetic rewards may come at the cost of increased predation or reduced survival, and vice versa. Within populations, foraging behavior is often composed of distinct strategies, each potentially conferring different trade-offs. Yet in female northern elephant seals, the extent to which individuals consistently employ particular strategies across their reproductive lifespan, and how such consistency relates to fitness, is poorly understood. This study addresses these questions using stable isotope analysis of hair samples collected over the past decade as a biochemical proxy for foraging strategy. By integrating these data with long-term demographic records (e.g., maternal age, reproductive history, and pup condition), we aim to quantify patterns of foraging consistency and evaluate their potential consequences for survival and reproductive output. Specifically, we aim to address: 1. Do individual female elephant seals exhibit consistent foraging strategies across their reproductive lifespan? 2. If so, are certain strategies more strongly associated with increased energy gain, survival, or reproductive success?
RESPONSIBILITIES	UROC student researchers will assist with data organization, preparation of samples for stable isotope analysis, handling large datasets, and may contribute to statistical analysis depending on interest and experience.
REQUIREMENTS	• Must be able to reliably commute to Moss Landing Marine Laboratories • Third year student or equivalent experience preferred • Training will be provided for lab skills, students should demonstrate a willingness to learn lab and computer skills, attention to detail, and keep detailed lab notes • Some experience in R programming, or another coding language, may be useful

PROJECT TITLE	Upwelling Impacts on Temperate Coastal Herbivory, Physiology, and Reproductive Performance of Purple Sea Urchins (NSF OCE 2308398)
PROJECT MENTOR	Nathaniel Spindel and Kayla Vidal MLML
PROJECT CONTACT INFORMATION	kayla.vidal@sjsu.edu
PROJECT DESCRIPTION	Summary: Investigating independent and combined impacts of temperature, acidification, and deoxygenation on the physiology, performance, and population dynamics of sea urchins whose grazing shapes nearshore ecosystems. Thesis Project Overview: Due to natural and anthropogenic factors reducing the populations of their primary predators, purple urchin numbers in California have increased to unprecedented levels, leading to the overgrazing of kelp and triggering phase shifts from biodiverse kelp forests to sea urchin-dominated "barrens". However, urchin gonads, commonly referred to as "uni", are a desirable seafood product, creating an opportunity to utilize this abundant species for aquaculture. "Urchin ranching", collecting urchins and developing their gonads in an aquaculture setting, presents a potential economic incentive for urchin removal from urchin barrens. By identifying the ideal temperature range that maintains high feeding efficiency while promoting quality gonad growth, it would be possible to maximize gonad size and nutrient content. This approach could not only make urchin ranching more profitable but also support sustainable seafood production and contribute to ecological restoration efforts. This lab based mesocosm experiment will subject urchins to various temperature, dissolved oxygen, and ph treatments and seeks to: Objective 1) Determine the individual and combined effects of ocean warming, hypoxia, and acidification on <i>S. purpuratus</i> reproductive performance and uni quality and nutritional value and Objective 2) Characterize the optimal temperature conditions for <i>S. purpuratus</i> gonad growth, quality, and nutritional composition for aquaculture The larger experiment objectives also include understanding how metabolic rates, respiration, growth, and the urchin microbiome are affected by these treatments.
RESPONSIBILITIES	Bioenergetics assays: aquatic respirometry, per capita consumption, size

	specific growth and gonad production, histology; Literature review In this experiment, you can be involved with whichever of the following interests you most in addition to mandatory maintenance tasks: respiration rate data collection, gonad histology, DNA extractions from gut contents and gonads from microbiome and gene expression analysis (TBD), and microscopic assessments of urchin jaw structure to determine growth rates. Maintenance tasks include: data management, literature review, urchin feeding and animal care, periodic large sampling events and dissections, and daily tank temperature, ph, and DO spot checks
REQUIREMENTS	• Must be able to reliably commute to Moss Landing Marine Laboratories • Some wet lab or aquarium experience preferred • Training will be provided for lab skills, students should demonstrate a willingness to learn lab and computer skills, attention to detail, professional work ethic, and keep detailed lab notes
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Surviving the heat: Coral metabolism under thermal stress
PROJECT MENTOR	Emma Saso MLML Graduate Student
PROJECT CONTACT INFORMATION	esaso@csumb.edu
PROJECT DESCRIPTION	This research investigates the mechanisms driving thermal tolerance in Galápagos corals to identify traits that enable resilience under climate stress. The project will focus on two key questions: 1) How does heat stress affect the growth, survival, and bleaching status of coral genotypes in the Galápagos? 2) What roles do coral genotype and symbiont composition play in determining thermal tolerance? In this specific part of the project, we investigate the metabolic rates of the branching coral <i>Pocillopora</i> from the Galápagos islands characterized by low, medium and high growth rates.
RESPONSIBILITIES	Undergraduate researchers will assist in processing photosynthesis and respiration data that was collected in July 2025 to determine coral metabolic rates. Specifically, the student will work on a method to calculate coral surface area using photography and available softwares such as ImageJ, CloudCompare and RStudio. There may also be opportunities for molecular lab work for an interested candidate. Through these activities, students will gain hands-on experience with cutting-edge techniques in marine ecology and contribute to solutions for coral conservation in a warming world. Simultaneously, students will write a literature review on the topic, learn scientific writing techniques and data analysis using RStudio.
REQUIREMENTS	• Third year student or equivalent experience (Required) • Introductory biology, MSCI, and chemistry courses (Required) • Some data processing experiencing • Some lab experience (from a previous research opportunity or lab section of a core class)
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Life in glass castles: Assessing the diversity of life associated with newly discovered deep-sea sponge reefs
PROJECT MENTOR	Amanda Kahn
PROJECT CONTACT INFORMATION	amanda.kahn@sjsu.edu MLML
PROJECT DESCRIPTION	Our team recently discovered a deep-sea reef built by the glass skeletons of sponges off the coast of southern California. These reefs were only known from the fjords of western Canada until this discovery. The new reefs are deeper, built by different species, and have different environmental conditions. These species are found elsewhere in the deep sea, so our question is: why do they form reefs here? What are the unique, emergent properties of reefs that differ from communities of individual sponges? We conducted video surveys using an autonomous underwater vehicle to document the communities of a live and dead reef area. This research seeks to: 1) Characterize and compare the diversity of communities associated with live reefs, dead reef structures, and nearby non-reef areas, and 2) Compare the physical conditions associated with live and dead reef areas, using data from sensors mounted on the AUV.
RESPONSIBILITIES	- Count and identify morphospecies of benthic invertebrates and demersal fish associated with reef habitat using VIAME software - Use several deep-sea species ID guides to identify morphospecies • Conduct nonparametric statistical analyses such as nMDS, PERMANOVA and ANOSIM, and calculate alpha and beta diversity from AUV footage - Create a georeferenced database of all identifications using ArcGIS - Create plots and calculate summary statistics of physical parameters measured by AUV sensors (temperature, dissolved oxygen, salinity, etc.)
REQUIREMENTS	- Must be able to reliably commute to Moss Landing Marine Laboratories, including for lab meetings. Remote work is negotiable if both parties agree to suitable arrangements, revocable any time if data sharing or communication are not sufficient. - Training will be provided for computer skills, students should demonstrate a willingness to learn new skills, attention to detail, professional work ethic, keep detailed lab notes, and maintain all data and analyses only in shared Google Drive settings.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Diet selection and community succession in stable deep-sea hydrothermal vents
PROJECT MENTOR	Amanda Kahn
PROJECT CONTACT INFORMATION	amanda.kahn@sjsu.edu MLML
PROJECT DESCRIPTION	Hydrothermal vents form at oceanic spreading centers, where superheated water takes up sulfidic and metal compounds as it moves through the seafloor. Once that water is released from a vent, those compounds can support unique chemosynthetic communities. Most hydrothermal vents are short-lived, venting only a few years or up to a decade. However, the brine-dominated vents of the Cleft Segment in the Juan de Fuca Ridge have been venting consistently for at least 30 years (possibly much longer). This means while communities growing on most vents might be at early stages of succession, vents in the Cleft Segment have had decades to develop, possibly allowing succession to progress further along a trajectory. Vents may also drive selection in these habitats as species adapt to a long-constant food supply. The objectives of this research are to: 1) use remotely operated vehicle (ROV) surveys to survey and document communities growing on the hydrothermal vents, and 2) assess diet of deep-sea sponges living near and far from vents.
RESPONSIBILITIES	• Count and identify morphospecies of benthic invertebrates growing on hydrothermal vents from the Cleft Segment using VIAME software • Use several deep-sea species ID guides to identify morphospecies • Create 3D reconstructions of hydrothermal vents from video surveys • Prepare physical sponge samples for stable isotope analysis to assess diet. • Create summary statistics and plots of results from stable isotope analysis and community data.
REQUIREMENTS	• Must be able to reliably commute to Moss Landing Marine Laboratories, including for lab meetings • Training will be provided for lab and computer skills, students should demonstrate a willingness to learn new skills, attention to detail, professional work ethic, keep detailed lab notes, and maintain all data and analyses only in shared Google Drive settings.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Piseco kelp Forest surveys
PROJECT MENTOR	Dan Malone and Mark Carr UCSC
PROJECT CONTACT INFORMATION	dmalone@ucsc.edu
PROJECT DESCRIPTION	The Carr Lab at the University of California, Santa Cruz (UCSC) is offering opportunities for students with scientific research diving certifications to participate in marine ecological research. Under the direction of Dr. Mark Carr, participants will assist with interdisciplinary studies focusing on questions in marine ecology, conservation of nearshore species, and oceanographic drivers of ecological processes. SCUBA diving is an essential function of this position.
RESPONSIBILITIES	• Participate in SCUBA based ecological monitoring surveys of kelp forests along the California Coast • assist with logistics for local and remote field missions • collect and perform quality control of data as well as help maintain project databases; • assist in maintenance of small boats and vehicles • students will have the opportunity to travel and work at remote field sites for periods of 1-2 weeks along the California Coast • be able to adapt to a variable and rigorous field schedule including long days and occasional weekends • be physically capable of carrying 75 pounds of field equipment to in and out of trucks and boats
REQUIREMENTS	AAUS dive certification
OTHER IMPORTANT INFORMATION	Students must be able to travel to UCSC campus

PROJECT TITLE	Environmental DNA analysis to aid the restoration of the Pajaro River system
PROJECT MENTOR	Liz Alter
PROJECT CONTACT INFORMATION	ealter@csumb.edu
PROJECT DESCRIPTION	As part of a larger project on improving water system resilience to climate change in the Pajaro River Valley, the Alter lab is undertaking biotic assessment in a section of the Pajaro River and Corralitos/Salsapudes Creek that is to be the subject of a major levee modification project, to assess potential for improvements to groundwater recharge, water quality, and habitat. Specifically, we are using environmental DNA, a molecular method to detect species from DNA left behind in water, sediment and other environmental samples.
RESPONSIBILITIES	Research students will be involved in field work collecting samples and data in the Pajaro River, which involves potentially long hours outside in (sometimes) muddy and adverse conditions. Students will learn basic (and potentially advanced) molecular laboratory skills including DNA extraction, PCR, Illumina library construction and sequencing, as well as data analysis including eDNA data processing. Students are encouraged to apply for grant and conference opportunities and lab personnel will provide guidance in these areas.
REQUIREMENTS	Training will be provided for lab skills. Successful applicants will show strong attention to detail; ability to focus closely on the task at hand; and basic comfort using computational tools such as R.
OTHER IMPORTANT INFORMATION	Students should expect to attend weekly lab meetings and be able to spend at least 5-6 hours per week in the lab (sometimes more depending on the week). For the purpose of lab safety, while in lab students must wear close-toed shoes, clothing that covers torso, shoulders and legs, and tie back long hair.

PROJECT TITLE	Understanding diversification in rockfishes, a hyperdiverse clade of marine fishes
PROJECT MENTOR	Liz Alter
PROJECT CONTACT INFORMATION	ealter@csumb.edu
PROJECT DESCRIPTION	Much of Earth's biodiversity has been generated through adaptive radiations, but we know little about the genomic changes that accompany these radiations, particularly in marine systems where incipient species may still be exchanging genes. This gap in knowledge impedes our ability to design effective conservation plans that take evolutionary processes into account. Rockfishes in the genus <i>Sebastes</i> have radiated into >110 species across a range of ecological niches and depths, and present an excellent case study in marine speciation. At least 66 species are found in the Northeast Pacific (NEP) with ~56 in broad sympatry. This extraordinary diversity, including many species pairs across replicated depth gradients, makes rockfishes an excellent model for understanding how divergence proceeds at the genomic level. The goals of this project are to analyze the genomic processes underlying speciation through comparative analyses of multiple sister species of rockfishes, and to integrate this work into undergraduate research and teacher training opportunities. The goals of this project are to: 1) Reconstruct the evolutionary relationships among rockfishes using phylogenomic methods; 2) Using whole genome data from sympatric species pairs across depths, infer the most likely divergence scenario including loci that have been exchanged through gene flow and those that are resistant to gene flow during speciation; 3) Compare morphological and ecological divergence with genomic divergence between species pairs.
RESPONSIBILITIES	Research students will learn basic (and potentially advanced) molecular laboratory skills including DNA extraction, PCR, Illumina library construction and sequencing, as well as data analysis including phylogenetic reconstruction and comparative genomics. Opportunities for comparative morphometric analyses also exist. Students are encouraged to apply for grant and conference opportunities and lab personnel will provide guidance in these areas.
REQUIREMENTS	Training will be provided for lab skills. Successful applicants will show strong attention to detail; ability to focus closely on the task at hand; and basic comfort using computational tools such as R
OTHER IMPORTANT INFORMATION	For the purpose of lab safety, while in lab students must wear close-toed shoes, clothing that covers torso, shoulders and legs, and tie back long hair.

PROJECT TITLE	Mechanisms of kelp forest persistence and recovery
PROJECT MENTOR	Joshua Smith
PROJECT CONTACT INFORMATION	jogsmith@ucsc.edu UCSC
PROJECT DESCRIPTION	The Nearshore Ecology Research Group at UCSC is conducting research to understand mechanisms of kelp forest persistence and recovery to advance our understanding of foundational ecological resilience and to support conservation solutions. California's iconic kelp forests are highly valued for their extraordinary biodiversity and the benefits they provide to people and nature. A combination of recent environmental and biological perturbations such as a marine heatwave, a catastrophic sea star die-off, and an outbreak of kelp-eating sea urchins decimated over 95 percent of kelp forests in northern California and nearly 80 percent along the central coast. Unfortunately, kelp deforestation is not unique to California and other places around the world are experiencing unprecedented declines. This internship will directly contribute to ongoing research aimed at advancing our understanding of mechanisms of kelp forest recovery in California to inform climate-ready action and management planning in our state and beyond.
RESPONSIBILITIES	The selected individual will assist with field observations and data collection through scientific scuba diving and laboratory assays. The student will participate with a team of divers in subtidal surveys and assist in the deployment and retrieval of sea urchin larvae and kelp spore settlement collectors, and conduct kelp productivity surveys. The student would spend several days per week conducting scientific SCUBA surveys, and also contribute to the quantification of recently settled sea urchin larvae and kelp spores under microscopes in the lab. The research will be conducted primarily along the Monterey Peninsula and in Carmel Bay, California, and in the Smith Lab in the Coastal Biology Building at UCSC.
REQUIREMENTS	(1) AAUS scientific diving and Nitrox certifications are required at the time of appointment, (2) Willingness to perform project task assignments on a flexible schedule, (3) Willingness to spend up to 8 hours at a time at sea in small boats conducting scientific diving operations, (4) Willingness to conduct 3 scientific dives in cold water (average water temperatures is 52 degrees F) per day, (5) Strong interest in marine ecology, (6) Strong interpersonal skills and proven ability to work effectively with colleagues, (7) Ability to work independently with minimal direct supervision, (8) Familiarity with basic data management and analysis using R is a plus.
OTHER IMPORTANT INFORMATION	Must be able to commute to UCSC

PROJECT TITLE	Untangling the causes of the Island Species Area Relationship
PROJECT MENTOR	Eli Lewis
PROJECT CONTACT INFORMATION	eli.lewis@sjsu.edu MLML
PROJECT DESCRIPTION	I'm a graduate student at MLML studying invertebrate diversity in kelp holdfasts. My thesis investigates the causes of the Island Species Area relationship, one of the oldest relationships in ecology that has puzzled ecologists for over 250 years. I will be using <i>Macrocystis pyrifera</i> holdfasts to investigate this question. They support upwards of 150 species, and I'll be testing several frameworks to explain that diversity, including Island Biogeography Theory, the Sampling Effect, and Habitat Complexity. The core work involves dissecting both real and artificial kelp holdfasts collected or deployed subtidally around Monterey Bay, and enumerating invertebrate species found. Students will gain hands-on lab experience in marine biology, contribute to an active research dataset, and develop practical skills in species identification and data entry. Students who are AAUS-certified may also have the opportunity to participate in fieldwork. At the end of the project, they'll be able to use the data they collected for their own final projects, analyzing the data they collected.
RESPONSIBILITIES	Students will be responsible for measuring, and identifying a subset of species present in kelp holdfasts. This includes using dichotomous keys and calipers.
REQUIREMENTS	Experience using dichotomous keys, experience identifying invertebrates, and attention to detail. Desired but not required: AAUS scuba diver.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	"From Bites to Biases: How Fish Behavior Shapes Catchability and Influences Hook-and-Line Monitoring in Central California MPAs"
PROJECT MENTOR	Keeler Nelsen
PROJECT CONTACT INFORMATION	keeler.nelsen@sjsu.edu MLML Graduate student Scott Hamilton's Research Lab
PROJECT DESCRIPTION	This research project is focused on recording fish interactions with a fishing lure and quantifying the interaction and behavior of individual fish towards a lure. The behavior of fish have been shown to be different inside protected areas compared to areas that receive fishing pressure. If fish behavior towards fishing gear is different inside and outside protected areas, this can confound the outcomes of hook-and-line monitoring of these MPAs. The primary question I am aiming to answer is: Does fish behavior towards a lure differ between protected areas and non-protected areas? The ultimate goal of this project is to detect differences in fish behavior and "catchability" in order to inform hook-and-line monitoring techniques. In order to record these interactions with a lure, a camera will be mounted above a fishing lure. This project will entail watching and extracting fish behavior from video recorded during summer MPA monitoring completed by the California Collaborative Fisheries Research Program (CCFRP).
RESPONSIBILITIES	I am requesting an undergraduate to help me watch videos of fish interactions with a lure and quantify lure interactions. According to an ethogram (description of behavior), the student should expect to record behavioral codes for specific lure interactions. Record the behavioral codes in a data sheet and input into Excel database.
REQUIREMENTS	Fish Species Identification (primarily rockfish), Video annotation experience, proficiency in Excel.
OTHER IMPORTANT INFORMATION	I am a current graduate student at MLML and I think that this is a great way to get some experience in fisheries and marine science! I would love to be a mentor, both for this project and for anyone interested in a career in marine science!

PROJECT TITLE	Enhancing conservation aquaculture of Olympia oysters, <i>Ostrea lurida</i>, to support Tribal and NERR stewardship
PROJECT MENTOR	Kai Rooney
PROJECT CONTACT INFORMATION	karooney@csumb.edu Graduate Student Alison Haupt's Lab
PROJECT DESCRIPTION	Olympia oysters, <i>Ostrea lurida</i> , are an important native foundation species along the Pacific Coast. Like many oyster species, Olympia oysters have experienced dramatic declines in population abundance over their native range. Oyster abundance in Elkhorn Slough, California's second largest estuary, is limited by recruitment failure and a lack of hard substrate. In recent years, researchers at the Elkhorn Slough National Estuarine Research Reserve (ESNERR) have used aquaculture to cultivate hatchery-raised oysters ready for outplanting in the estuary. ESNERR and its partners, including the Amah Mutsun Land Trust (AMLT), would like to better understand the impact of hatchery-raised oysters on wild oyster recruitment. Specifically, this project aims to 1) Examine if hatchery-raised oysters increase recruitment rates in tidal creeks with and without wild oysters, and 2) Determine if hatchery-raised oysters increase wild recruitment at a very local (meter-level) scale.
RESPONSIBILITIES	Students will be assisting with monthly monitoring of recruitment tiles in tidal creeks at Elkhorn Slough. Tasks include reading literature, collecting species cover data from recruitment tiles via kayak, photographing tiles, data entry, and analysis. Students will receive training on species identification and water/lab safety.
REQUIREMENTS	Comfortable in a kayak and around water. Can lift up to 50 lbs. Monitoring will be conducted in muddy, wet conditions. Kayaking experience preferred, not required. Students with experience in R or GIS are encouraged to apply.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	The effects of El Niño conditions on growth, reproduction, and survivorship in surfperch
PROJECT MENTOR	Katerina Vicini
PROJECT CONTACT INFORMATION	katerina.vicini@sjsu.edu
PROJECT DESCRIPTION	Current climate models are predicting that a super El Niño may develop in 2026. El Niño events often lead to increased ocean temperatures, reduced nutrients and primary productivity, and reduced prey availability in California's coastal waters. Shiner and dwarf surfperch, viviparous marine teleosts found in surf zone and estuary habitats, may experience altered growth rates, reproductive timing and output, and survivorship due to changing oceanographic conditions associated with El Niño. In addition, differences in habitat condition between a sandy beach and estuary may enhance potential effects of El Niño on surfperch populations. In order to investigate reproductive timing and the effects of environmental conditions on fecundity and embryo development, adult female surfperch will be sampled during the birthing season from different habitat conditions and then dissected to extract otoliths and embryos when pregnant. Juvenile surfperch will be collected to measure embryonic and early juvenile growth trajectories using extracted otoliths. This in conjunction with individual size measurements across a seasonal scale will be used to infer size-selective mortality. Surfperch are caught primarily in recreational fisheries and play an important ecological role as middle trophic level forage fish. By examining how extreme weather conditions influence surfperch reproduction, growth, and survivorship based on habitat, this study can inform ecosystem management strategies.
RESPONSIBILITIES	The UROC student(s) may be involved in fieldwork, lab work, and/or data analysis. Specific activities that students may participate in include: Beach seining and other fisheries fieldwork methods to catch adult and juvenile surfperch; Handling, measuring, and collecting fish in a humane and efficient manner; Dissecting surfperch specimens under a microscope to extract otoliths and embryos, and recording corresponding dissection data; Preparing otoliths for analysis using established protocols and recording measurements on otolith age and growth rates; Using various computer programs such as ImageJ and R in order to record quantitative measurements and perform data analysis; Reading and interpreting scientific literature related to the project.
REQUIREMENTS	- No prior experience with field or lab work required, but students should have a willingness to learn and enthusiasm for scientific research. Students should have good communication skills and attention to detail. - (If participating in field work) ability to swim and tread water, ability to carry heavy equipment to beach field sites, and an openness to handling marine fish and invertebrates - (If participating in lab work) an openness to handling dead specimens and performing dissections, and an ability to follow designated protocols - Means of transportation to and from Moss Landing Marine Laboratories
OTHER IMPORTANT INFORMATION	Field work takes place from June-September in 2026 and 2027. Dissections and lab work will also take place during this time, but will primarily occur outside of the field season. For field work, I will send students a list of possible dates to sign up for. For lab work, I will also send dates/times to sign up for, but I will try to accommodate students' schedules to the best of my ability. It is highly recommended that students have a means of transportation to both MLML and associated field sites, but I can occasionally provide transportation to field sites and will encourage students to carpool.

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MATHEMATICS AND STATISTICS

MECHATRONICS ENGINEERING

PROJECT TITLE	Development and evaluation of a PWM nozzle controlled liquid application system
PROJECT MENTOR	Prashanta Pokharel
PROJECT CONTACT INFORMATION	ppokharel@csumb.edu
PROJECT DESCRIPTION	The goal of this project is to design a pulse-width modulation-controlled low-pressure sprayer system for accurate liquid applications. Key design considerations include modularity, compatibility with robotic platforms, suitability for in-house testing and development, onboard hardware and software for control and data acquisition, and the ability to record as-applied data. A system meeting these requirements will be built, and its nozzle pressure response and spray characteristics will be evaluated to assess spray accuracy.
RESPONSIBILITIES	Collect the sensor data, digitize water sensitive paper spray cards, perform image processing, and analyze the data
REQUIREMENTS	Willingness to learn, experience or interest in learning the MS Office suite, strong record-keeping skills, and attention to detail
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Assessing droplet spectra variability and spray coverage of PWM-controlled nozzles during turning
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PROJECT MENTOR	Prashanta Pokharel
PROJECT CONTACT INFORMATION	ppokharel@csumb.edu
PROJECT DESCRIPTION	Past research on spray technologies has primarily focused on analyzing spray coverage and droplet spectra characteristics under steady-state conditions. However, there is limited information available regarding spray coverage and droplet spectra when utilizing a PWM- controlled spray nozzle during turning. As-applied spray characteristics, including droplet size, distribution, and coverage, offer valuable insights into chemical application efficacy. Such localized spray characteristics information can be utilized to evaluate the performance of PWM nozzle control, providing producers and other stakeholders with the insights needed to make informed and effective decisions for achieving higher spray application accuracy.
RESPONSIBILITIES	Data collection, digitization, image processing, data analysis
REQUIREMENTS	Willingness to learn, experience or interest in learning the MS Office suite, strong record-keeping skills, and attention to detail
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Development of a novel simulation framework to optimize spray use efficacy for using multiple degree-of-freedom nozzle control system
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PROJECT MENTOR	Prashanta Pokharel
PROJECT CONTACT INFORMATION	ppokharel@csumb.edu
PROJECT DESCRIPTION	There is an opportunity to develop a novel vision-based mechatronic system capable of real-time position and flow control for accurate, on-target chemical applications. The development and evaluation of such a system could provide valuable insights into the suitability of a spray nozzle under various canopy characteristics. However, designing and testing a physical prototype of a vision-based, multiple-degree-of-freedom nozzle control system could be cost-prohibitive. A computer simulation framework will provide all the essential information needed to determine the optimal nozzle types under various boundary conditions and control strategies for on-target spray applications. This information will also offer critical insights into appropriate flow and nozzle control mechanisms for optimal sprayer performance.
RESPONSIBILITIES	Simulate different spray patterns under different theoretical boundary conditions
REQUIREMENTS	MATLAB programming skills
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	A machine vision based nozzle control system to optimize chemical use efficacy for vertical spray applications
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PROJECT MENTOR	Prashanta Pokharel
PROJECT CONTACT INFORMATION	ppokharel@csumb.edu
PROJECT DESCRIPTION	Modern agriculture relies on chemicals for crop protection and improved yields. However, current spray technologies fall short of achieving site-specific on-target applications in specialty crop systems. This limitation is mainly attributed to the absence of real-time plant canopy profile information and a suitable nozzle control mechanism, resulting in increased costs and environmental impacts. This study aimed to develop and validate an intelligent nozzle control mechanism based on variable profile plant contours for precise chemical application.
RESPONSIBILITIES	Develop algorithms to extract the plant canopy information using a stereo vision camera
REQUIREMENTS	Python and/or C++ programming skills
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	UAV image processing for Almond and alfalfa field, which is a collaboration with USDA.
PROJECT MENTOR	Haoyu Niu

PROJECT CONTACT INFORMATION	hniu@csumb.edu
PROJECT DESCRIPTION	Students will learn and work on UAV image processing, computer vision, and objection detection.
RESPONSIBILITIES	
REQUIREMENTS	<u>Requirements:</u> Programming knowledge, Python programming preferred Soft skills: open communication, collaborative, attention to detail, adaptable, analytical, self-motivated/independent.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Robotic project.
PROJECT MENTOR	Haoyu Niu
PROJECT CONTACT INFORMATION	hniu@csumb.edu
PROJECT DESCRIPTION	Students will learn how to design, writing codes to control a Unitree robotic dog.
RESPONSIBILITIES	
REQUIREMENTS	<u>Requirements:</u> Programming knowledge: Python preferred. Former robotics experience in operations preferred but not required. Problem solving abilities to troubleshoot hardware and software interactions. Systems thinking. Soft skills: open communication, collaborative, self-motivated/independent.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Development of an autonomous navigation system for a modular scouting robot
PROJECT MENTOR	Prashanta Pokharel
PROJECT CONTACT INFORMATION	ppokharel@cumb.edu
PROJECT DESCRIPTION	This project focuses on the development of a simple GPS-guided autonomous navigation system for a modular scouting robot. The project will involve designing, testing, and improving the robot's navigation software and hardware integration, including GPS-based waypoint tracking, basic path planning, and motion control. The UROC student will participate in research activities such as reviewing related work, assisting with system design, conducting field tests, collecting navigation performance data, and helping evaluate the accuracy and reliability of the robot's autonomous movement.
RESPONSIBILITIES	Specific responsibilities may include reading and summarizing literature on autonomous mobile robots and GPS navigation, assisting with programming waypoint navigation algorithms, integrating sensors and microcontroller components, preparing the robot for outdoor testing, collecting and organizing field-test data, analyzing navigation accuracy and documenting results. The student will gain hands-on experience in robotics, embedded systems, field testing, and applied engineering research.
REQUIREMENTS	Basic programming skills, Basic knowledge of sensors and microcontroller systems
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Stereo Vision-Based Lettuce Canopy Volume Estimation for Precision Robotic Spraying
PROJECT MENTOR	Prashanta Pokharel
PROJECT CONTACT INFORMATION	ppokharel@cumb.edu
PROJECT DESCRIPTION	This project will use a stereo vision camera to estimate lettuce canopy volume for precision robotic spraying. The goal is to evaluate how well stereo vision can estimate lettuce canopy volume under real growing conditions and use the volume information for precision spraying. The UROC student will help develop machine vision algorithms, collect image data, compare camera-based volume estimates with manual plant measurements, and study how shadows, overlapping leaves, camera angles, and plant size affect the accuracy of the system.
RESPONSIBILITIES	The student involved in this project will help set up the stereo vision camera, capture lettuce canopy images, organize image files, record test conditions, and take manual plant measurements for comparison. They will also help develop machine vision algorithms to estimate canopy volume from depth images or point cloud data. As the project moves forward, they will assist with connecting the vision system to the precision sprayer so that canopy measurements can help guide spray decisions. They will also prepare simple graphs, tables, and summaries of the results.
REQUIREMENTS	Interest in robotics, machine vision, or precision agriculture Basic programming experience, preferably in Python or C/C++. Willingness to learn image processing and 3D data analysis. Comfortable working with cameras, sensors, and robotic equipment. Careful with data collection, note-taking, and file organization. Willing to help with field or greenhouse testing
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Stereo Vision-Based Lettuce Canopy Volume Estimation for Precision Robotic Spraying
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PROJECT MENTOR	Prashanta Pokharel
PROJECT CONTACT INFORMATION	ppokharel@cumb.edu
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OTHER IMPORTANT INFORMATION	

UNIVERSITY COLLEGE

SERVICE LEARNING INSTITUTE

PROJECT TITLE	Telling the Story of Service Learning
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PROJECT MENTOR	Chrissy Hernandez
PROJECT CONTACT INFORMATION	chrihernandez@csumb.edu
PROJECT DESCRIPTION	This project will consider the efficacy of Service Learning at CSUMB, specifically the experiences of CSUMB students during the 2023-2024 academic year. Reviewing a robust data sample of CSUMB student evaluations of service experiences, we will create a report to be shared during a Service Learning Symposium about the skills, benefits, and challenges students have experienced. This will be a good opportunity to gain experience in data organization and interpretation, as well as to better understand CSUMB's signature approach to experiential learning.
RESPONSIBILITIES	UROC researchers will review and code student surveys from the 2023-2024 school year and create and present a report on their findings.
REQUIREMENTS	Good organizational skills, interest in service learning, experiential learning, and/or program evaluation.
OTHER IMPORTANT INFORMATION	

PROJECT TITLE	Localization of Ethnic Studies
PROJECT MENTOR	Chrissy Hernandez
PROJECT CONTACT INFORMATION	chrihernandez@csumb.edu

PROJECT DESCRIPTION	Within the embattled and emergent context of Ethnic Studies (ES) mandates, this moment offers an opportunity to model an ES curricular framework based on local voice, histories, and communities. This project considers how the Salinas Union High School District (SUHSD) is localizing their ES curriculum by democratizing archival materials; fostering civic action through participatory action research projects; and creating critical service learning and ES pipelines between SUHSD and CSUMB. The overarching research question is: How does the localization of history and civics curriculum support the development of Ethnic Studies praxis for students, teachers, and community members? This exploratory case study will inform an emergent framework for localized ES praxis that centers place-based storymaking through civic action and a community-centered archive. Our research team, including local educators, students, community organizers, and artists with substantial Ethnic Studies expertise, will work with classroom teachers to develop, document, and assess a localized Ethnic Studies curriculum and praxis. Central to Ethnic Studies praxis, this project expands upon making meaningful connections between classrooms (content, people, and practice) and communities (histories, civic action, and activism). UROC researchers would choose one aspect of the project to work on: Archival research; Ethnic Studies in the classroom; or program evaluation or zooming out to consider the project as a whole.
RESPONSIBILITIES	UROC researchers can choose to work on the development and facilitation of a fall research retreat assessing the progress of the project so far; develop curricular materials for educators; archival research in local archives around themes of race and resistance; code curricular materials, and/or join the planning team of the spring conference and research retreat.
REQUIREMENTS	Skill desired: Interest in Ethnic Studies, education, and social justice; good organization skills; desire to be part of a research collective including community partners.
OTHER IMPORTANT INFORMATION	

TANIMURA AND ANTLE LIBRARY

PROJECT TITLE	
PROJECT MENTOR	
PROJECT CONTACT INFORMATION	
PROJECT DESCRIPTION	
RESPONSIBILITIES	
REQUIREMENTS	
OTHER IMPORTANT INFORMATION	