CONNOR GRADY

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RE: Cover Letter | Summer Internship Program
Monterey Bay Aquarium Research Institute (MBARI)

February 27, 2024

Dear Dr. George Matsumoto, Gene Massion, Dr. Giancarlo Troni, Dr. Thom Maughan, and colleagues,

I am eager to join MBARI's 2024 Summer Internship Program on the Autonomous Coastal Profiling Float (CPF), Scalable Marine Robotics, or Bidirectional Communications Argos Satellite Tag projects. As a General Systems Engineer, I am driven to engineer systems at MBARI for researching and protecting marine ecosystems from anthropogenic climate change.

Several years ago, I discovered Marine Permaculture, the Climate Foundation's (CF) approach to cultivating seaweeds in ocean dead zones. Fascinated with the project, I made a cold call to the CF's Executive Director, successfully initiating a partnership for my Senior Design Thesis at Santa Clara University (SCU).

In a matter of months, I led fundraising of over $5,000 to support the project. I led a diverse team of women engineers, minority peers, and first-generation students through rapid design sprints. Together, we designed, modeled, and published a novel approach to marine telemetry using unjacketed steel cables, earning university awards for social impact and service to others.

I continued on as a Research and Design Engineer with the CF in the Philippines, designing and deploying an autonomous control buoy. I programmed embedded microcontrollers, using real-time data from ocean telemetry sensors to actuate the growing beds to varying depths. To integrate rotary encoders, bluetooth modules, telemetry sensors, and limit switches, I employed my proficiency in low-power electrical hardware. Leveraging my skills in SolidWorks CAD and hands-on prototyping, I manufactured marine- and hurricane-proof mechanical parts. As a PADI-certified scuba diver and freediver, I deployed these designs kilometers off-shore, optimizing seaweed growth conditions and maximizing carbon sequestration.

I returned from the Philippines with a clarified interest in designing oceanography equipment for scientific research and decarbonization. Consequently, I am most eager to work on Gene Massion's CPFs, contributing to a multidisciplinary project designed for impactful scientific missions. I am confident that my aptitude and passion for electro-mechanical prototyping positions me to excel on Gene's team.

MBARI's Summer Internship Program will help me clarify my interests in the ocean engineering sector and inform the topic of my graduate school studies. I even hope to collaborate with MBARI for my thesis research as I pursue a Masters in Mechatronics, Mechanical, or Systems Engineering starting next year.

I look forward to discussing my interest in joining MBARI's Summer Internship cohort further. Thank you for considering my application!

Sincerely,

Connor Grady

RE: Additional Information

Project Interests:

*Autonomous Coastal Profiling Float (CPF) with advisor Gene Massion
*Scalable Marine Robotics with advisor Giancarlo Troni
Bidirectional Communications Argos Satellite Tag with advisor Thom Maughan
**Most align with my interests and career ambitions*

Relevant Coursework and Grades

Mechatronics: B+
Engineering Design & Prototyping: A
Materials & Manufacturing Processes: B
Statics: A-
Thermodynamics: B+
Strength of Materials: B-
Logic Design: A
GIS: A-
Design Thinking: A
Community Based Engineering Design: A-
Alternative Energy Systems: A
Environmental Technology: B+
Energy and the Environment: B
Sustainability 101: B
Graphic Communication in Design: A-
Engineering Communications: A

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SUMMARY — General Systems Engineer specializing in mechatronics and marine product design. Seeking Summer Internship at MBARI working on Autonomous Coastal Profiling Float (CPF), Scalable Marine Robotics, or Bidirectional Communications Argos Satellite Tag projects.

EDUCATION

Bachelor of Science, General Engineering, Santa Clara University (SCU), Santa Clara, CA — June 2023
Concentrating in Sustainable Systems; Sustainability Minor
Graduated Cum Laude; earned SCU Dean's Scholarship, Bronco Scholarship, Summer Grant, Incentive Grant

Design Thinking Minor, SCU Abroad Barcelona, Spain — September 2021- December 2021
Universidad de Barcelona, UVic BAU College of Arts & Design, URL LaSalle Business School

Relevant Coursework — Mechatronics, Materials & Manufacturing Processes, Engineering Design & Prototyping, Strength of Materials, Material Science, Logic Design, Environmental & Food Justice, Alternative Energy Systems, Environmental Technology, Energy & the Environment, Sustainability 101, Graphic Communication in Design, Engineering Communications

PROFESSIONAL EXPERIENCE

Research & Design Engineer, Climate Foundation, Compostela, PH — June - October 2023
Designed and manufactured custom marine control buoy. Programmed and tested embedded microcontrollers; integrated bluetooth-smartphone communications, depth tracking, failsafe conditions, and marine hardening. Deployed hurricane-proof, solar-powered system offshore in the Philippines.

Silicon Valley Power Sustainable Futures Fellow, City of Santa Clara, CA— June 2022 - June 2023
Authored publishable policy framework to guide new City-specific "Equitable Shared Solar Program" based on year-long research. Leveraged GIS and LiDAR to calculate rooftop solar potential on multifamily buildings.

Certificate of Mayoral Recognition, City of Santa Clara, CA — May 2023
Awarded for my dedication in studies benefiting income-qualified residents.

Microgrid Project Development & Sales Intern, BoxPower Inc., CA — June 2022 - December 2023
Invented industry-pioneering strategy for optimally locating remote solar microgrids via GIS web applications. Inspired creation of "Microgrid Integration Survey (MGIS)" program, leading BoxPower to sign multi-million dollar Master Service Agreements to deploy microgrids for wildfire mitigation and grid decarbonization.

ACADEMIC PROJECTS

Marine Permaculture Design Project, SCU, CA — September 2022 - June 2023
Managed interdisciplinary engineering team on capstone project in partnership with the Climate Foundation. Developed servo loop to automate offshore Marine Permaculture technology. Modeled and tested novel approach to marine telemetry data transfer using unjacketed inductive coupling for depths up to 200 meters.

Humanitarian Senior Capstone Award, SCU School of Engineering, CA — June 2023
Awarded for the capstone project achieving the greatest social impact.

Raymond M. Galentine Award, SCU School of Engineering, CA — June 2023
Awarded to an outstanding senior committed to service of others.

Mechatronics Robot Design, SCU, CA — January - March 2023
Engineered and assembled robot with multidisciplinary team to autonomously complete "Whac-A-Mole" course. Facilitated electro-mechanical controls design; coded Arduino microcontroller and implemented electronic sensors, servo motors, and actuators. Managed structural design; utilized recycled materials and 3D-printed components to meet cost, reliability, and performance criteria.

Virtual Game Logic Design, SCU, CA — January - March 2022
Programmed virtual ping-pong game in Verilog HDL using latches, flip flops, counters, registers, memory, and busses. Developed and captured logic schematics in LabView and Quartus CAD.

Mapping Optimal Locations for Offshore Seaweed Cultivation, SCU, CA — September - December 2022
Analyzed 10-meter bathymetric contours and sea surface temperature, mapped existing kelp forests in Monterey Bay. Identified optimal regions for seaweed farming in Santa Cruz and Monterey Bay coastal waters using R, ArcGIS, and LiDAR data.

Electromechanical Device Design, SCU, CA — January - March 2020
Constructed autonomous robot with two teammates; entered into freshman student competition. Programmed via Arduino microcontroller to synchronize physical movements to light flashes and music. Harnessed by-hand circuit analysis techniques and CAD to prototyped hardware. Satisfied size, cost, usability, and power constraints.

Tiny House Architectural Design, SCU, CA — September - December 2019
Designed architectural plans for two-story tiny home to provide bridge housing for homeless family of four. Followed ANSI specifications and GD&T techniques for hand-sketched blueprints and final AutoCAD drawings.

SERVICE

Student Advisory Board, Ciocca Center for Entrepreneurship, SCU, CA — August 2021 - August 2022
Collaborated with organizations and clubs across campus. Approved and suggested new entrepreneurship curriculum and program offerings.

Building Site Leader, Homes Without Boundaries, Tijuana, MX — April 2018, April 2019
Directed complete house build; oversaw concrete slab formation, framing, roofing, and door/window additions. Volunteered 80 hours of service in construction of two local family homes.

SKILLS

Software — SolidWorks, AutoCAD*,* C++, ArcGIS, Python, MATLAB, MCU/PLC Programming, LabView, Quartus, Verilog, Microsoft Excel, Web Design
Technical — Injection Molding, 3D Printing, Milling, Lathe Operation, Welding, Machining, Laser Cutting, Soldering, Woodworking, Electrical Circuitry, GD&T, ANSI, Marine Hardening, FEA, Fatigue Analysis
Management — Agile Sprints, GANTT Charts, Project Documentation, Technical Reports, Presentations

LICENSES & CERTIFICATIONS

Mechanical Engineer in Training — FE Exam in March 2024
PADI — Open Water Scuba and Shark Conservation Diver certified; 20 hours experience freediving at offshore engineering site

PUBLICATIONS

Gabriele, A., Grady, C., Rufus, J., Vargas, I. (2023). Thermometer Servo Loop for Actuating Marine Permaculture. *Bioengineering and General Engineering Departments, Santa Clara University*. https://scholarcommons.scu.edu/idp_senior/97

Grady, C. (2023). Designing an Equitable Shared Solar Program for Income-Qualified Multifamily Housing Residents | City of Santa Clara. Manuscript, *Santa Clara University.*

PHOTOGRAPHY — Experienced film photographer; portfolio available at www.connorgradyphoto.com

Santa Clara University
School of Engineering

February 23, 2024

To the MBARI Summer Internship program selection committee,

It is with great pleasure that I recommend Connor Grady for the Summer Internship program at MBARI. As an engineering student, Connor embodies a remarkable fusion of engineering principles and sustainability ideals. I know Connor as his faculty advisor and was his professor in multiple engineering courses at Santa Clara University.

Connor truly works at the intersection of engineering and sustainability. He had a Sustainable Engineering concentration within his General Engineering major, along with two minors, one in Sustainability and one in Technical Innovation, Design Thinking, and Entrepreneurial Mindset. During his time at SCU, he worked on projects in mechanical design, robotics, embedded microcontrollers, low-power electronics, and software. Perhaps most relevant to the MBARI internship was his experience as part of a senior design project. His project was partnered with the Climate Foundation, a partnership sought out and facilitated by Connor himself! He worked to improve the production and health of kelp seaweed beds in the Philippine Ocean by automating the bed winch system based on temperature readings from beneath the waves and optimizing the bed's position within those readings. In addition to the technical work, he also exhibited exceptional leadership and communication skills, within his team and externally with fundraisers and his partner organization. Connor truly is a multidisciplinary, mechanical-focused engineer, driven by a passion for sustainability and marine product design.

Overall, Connor's dedication to sustainability was evident not only within his pursuits at Santa Clara University, but also abroad where his experience in Barcelona inspired an independently researched academic paper titled "Evaluating the Sustainability of Biomass Power for Electricity Generation." Furthermore, he has explored sustainable agricultural practices in rural Belize and evaluated the potential of renewable energy sources for the future. Finally, he visited the Climate Foundation work in the Philippines bringing his working prototype and project knowledge to test in the real-world ocean environment. He has learned much through these experiences, leading him to now pursue a MS degree in Mechanical Engineering, focused on a future career in marine mechatronics.

In summary, Connor's passion for sustainability, coupled with his engineering acumen, sets him apart as an exceptional candidate for the Summer Internship Program at MBARI. I have no doubt that he will leverage this opportunity to further his knowledge and contribute meaningfully to

Santa Clara University
School of Engineering

sustainable practices. I wholeheartedly recommend Connor for this internship and believe he will excel in any endeavor he undertakes. If you have any further questions, feel free to contact me at (408) 551-3337 or via email <jkuczenski@scu.edu>and I'll be happy to answer any questions you may have.

Sincerely,

Jessica Kuczenski