

January 10, 2022

Dear MBARI Internship Team,

It is with great interest and enthusiasm that I am applying for the MBARI Summer Internship program for the Summer of 2022. I believe my qualifications and experience make me an ideal candidate for this position.

I fell in love with marine biology last summer through my work with the Woods Hole Oceanographic Institution (WHOI), the Centre Scientifique de Monaco (CSM), and the Centre National de la Recherche Scientifique (CNRS). As part of this internship, I designed a machine learning algorithm to classify penguin breeding cycles using rfid tag data. But the real benefit came from the people that I met. Learning about the career paths of my coworkers inspired me beyond words; in short, they were living my dream. While I have enjoyed my coursework in Mechanical Engineering and Modern Languages (French and Chinese), this internship made me realize that marine biology is my chosen career. It is a little too late to change my major, but I am now very seriously considering a PhD in marine biology or ecology. My purpose in applying for this internship is to confirm that I have the resolve for a 5-year program, and to experiment working in an in-person environment.

Before working with WHOI, I had the opportunity to perform research in various other fields. My previous experience includes:

- Research with the Research Center for Eco-Environmental Sciences in Beijing
- Research with the Majumdar Energy lab at Stanford, where I worked with the engineering team on the direct conversion of methane to methanol through photocatalysis
- An internship with Nitricity, where I helped design, permit, and build a 50 kW solar panel system to make greener, on-site nitrogen fertilizer
- An internship with the National Renewable Energy Laboratory, where I used high-fidelity models to compare the impacts of steady and unsteady air conditions on wind turbines.

I additionally led the management team and taught for Inspirit AI, an organization that continues to teach thousands of middle school, high school, and college students the fundamental concepts of machine learning, started a non-profit organization to connect college students with older adults during coronavirus isolation, and partnered with TCHO to create biochar from abandoned cacao husks for the use of their farmers in Ghana.

Any of these previous employers would tell you that I am enthusiastic, driven, independent, and excited to learn. Nitricity quickly labeled me a “super-intern,” and needed to hire a full-time team member to replace me after I left. Under my support, the Inspirit AI program grew from a few hundred students each session to a few thousand. The management structure that I developed while I headed that program continues to be used by the current team. And, although I didn’t have any artificial intelligence experience before my employment there, after some self-study I was soon teaching classes, leading virtual conferences around the world, and was even invited to give a TEDx talk on the subject. After my contribution to the TCHO biochar team, I was asked to be the course assistant for the Engineers for a Sustainable World class.

I have taken several classes which could apply to an internship with MBARI. These include: Frontiers in Marine Biology (S), Introduction to Ecology (A), Engineering Thermodynamics (A-), Mechanics of Materials (S), Foundations of Product Realization (A), Dynamic Systems, Vibrations, and Control (S), and Computational Engineering (A-). This year, I plan to take: Historical Ecology at Hopkins Marine Station, Introduction to Robotics, Design and Control of Haptic Systems, and Feedback Control Design.

The project that is of most interest to me is “Ocean productivity from bio-optical sensors on autonomous platforms” with Jacki Long and Yui Takeshita. Because my internship with WHOI was mostly online, the in-field components of this project are especially attractive. And, while I would love to collect data on a research cruise and work up-close with autonomous vehicles (I mean, who wouldn’t??!), I additionally think that this project most closely aligns with my previous research and engineering experience. I want an internship to which I can add value, and feel that I could do so with this project.

That being said, I am equally excited about the autonomous CPF project with Gene Massion. I am a certified Solidworks CAD Associate, have worked with C and C++ in the past, and have limited experience with microcontrollers as part of my research at Stanford. The functionality and engineering challenges associated with CPFs have baffled and amazed me since I first learned about them, and would be honored to have the opportunity to see them up-close!

I am also interested in Kakani Katija’s Bioinspired Design project. I have followed similarly-minded efforts from Mark Cutkosky at Stanford, and truly believe that learning from our environment’s natural capabilities is the future of engineering.

While these are my top three choices for the summer internship, I would be honored and grateful to be accepted into a position of any capacity. I have loved MBARI since I was a child, sitting in awe of the films at the Monterey Bay Aquarium and inspired by a team that got to

experience the world and have fun for their job. It is my dream to work with your organization, and would be happy to provide any further information to help in your decision.

All the best,

Emily Wong

emcmwong@stanford.edu

650-281-9537

<https://emcmwong.wixsite.com/aboutme>

EDUCATION

Stanford University, Stanford CA Class of 2022	GPA: 3.8/4.0
Prospective B.S. in Mechanical Engineering and minor in Modern Languages	
Relevant Coursework: Programming Abstractions, Dynamics, Mechanics of Materials, Engineering Thermodynamics, Fluids Engineering, Engineering Design, Product Realization, Computational Engineering	
Carlmont High School, Belmont CA Class of 2017	GPA: 4.4/4.0

RELEVANT EXPERIENCE AND PROJECTS

Intern, National Renewable Energy Laboratory (NREL)	September 2021 – December 2021
- Generated input files for a variety of conditions and airfoils - Analyzed the differences between experimental data and calculated data from high-fidelity models to assess the impact of unsteady air conditions on wind turbines, to improve the accuracy of the models	
Summer Intern, Woods Hole Oceanographic Institute, MA	June 2021 – August 2021
- Used Artificial Intelligence to analyze king penguin breeding cycles based on rfid chip data - Spent a week on-site, learning how to use analytical tools to collect data. - Prepared for Antarctic expeditions, dissected penguins, and supported the team at the Centre Scientifique de Monaco (CSM) and the Centre National de la Recherche Scientifique (CNRS)	
Mechanical Engineering Intern, Nitricity, San Francisco CA	March 2021 – June 2021
- Helped build an arcing reactor to make nitrogen fertilizer from just air, water, and solar - Obtained permit for and built a 50kW solar panel system on a farm in Fresno	
Undergraduate Research Assistant, Majumdar Energy Lab, Stanford CA	March 2020 – January 2021
- Researched direct conversion of methane to methanol through photocatalysis - Built an LED control system using an Arduino microcontroller, and a high-pressure photoreactor	
Lead Program Manager and Instructor, Inspirit AI	December 2020 – Present
- Made sure that all aspects of the program, including several hundred students and dozens of staff members, ran smoothly - Communicated with students and parents, maintained organization, and managed instructors - Enthusiastically taught high school students from around the world the foundational concepts of AI	
Intern, Research Center for Eco-Environmental Sciences, Beijing China	February 2018 – April 2018
- Supported PhD students and their research to further learning on environmental science, the research process, and conservation with a focus on China - Traveled with a small team to a nature reserve in northern Sichuan to perform a preliminary search of the area and observe examples of environmental uses of natural capital	

LEADERSHIP AND CO-CURRICULAR ACTIVITIES

Course Assistant, TCHO Team Member, Engineers for a Sustainable World	December 2020 - Present
- Working with TCHO and CRIG, this team repurposed cacao husks to produce biochar, an organic substance that can act as activated carbon in water filters - Helped manage the whole class, choosing course material, interviewing perspective students, and leading discussions	
Chief Financial Officer and PenPal Team Lead, Virtual Companions	April 2020 – September 2021
- Co-creator of this nonprofit, which connects older and younger generations to help ease the loneliness of seniors during the coronavirus shelter-in-place - Managed the nonprofit bank account and finances, including reimbursements	
Vice President and Social Media Chair, The Stanford Breakfast Club	April 2019 – Present
This organization makes and serves breakfast to some of the homeless population in Palo Alto	
Member, Stanford Equestrian Team	October 2019 – Present
TEDx Speaker	May 2021

SKILLS AND INTERESTS

Technical: SolidWorks CAD Associate, C++, Java, Python, JavaScript, Word, SkyCiv Engineering Software, ANSYS
Languages: English (fluent, first language), Mandarin (HSK level 5, advanced, lived in China for 1 year), French (intermediate advanced, lived in France for 6 months)
Interests: The intersection of Mechanical Engineering and Environmental Conservation and Justice



Dear whom it may concern,

I'm writing to provide my highest possible recommendation for Ms. Emily Wong, a mechanical engineer who interned for 10 weeks with our business in the Spring of 2021. During her internship, I saw Emily grow as an engineer, student, and leader. We are very grateful for the work she helped us with. This letter describes the background for the project Emily was involved in and highlights the mechanical and social engineering skills she demonstrated during her internship.

For background, our business [Nitricity Inc.](#) is a technology company that manufactures nitrogen fertilizer. We develop and manage assets that produce nitrogen fertilizer using air, water, and solar energy as inputs. Accordingly, planning, designing, and installing solar is a major aspect of our business, and Emily was central in helping us with our largest commercial-scale system to date. I've attached a picture representing the result of some of her work with our business, one that generated headlines.

As part of her internship, Emily demonstrated strong mechanical engineering skills and a desire to grow and improve. Specifically, Emily helped us design and build a complex reactor, made CAD models in SolidWorks, communicated with our machinist, and gained experience using power tools, such as angle grinders and welders. Notably, at the conclusion of her internship, and her completion of Nitricity's training program, Emily was able to pass her SolidWorks Associates test and become officially certified. I'll note that her CAD skills were exceptional, and she passed the Solidworks CSWA with a score of 100%.

Emily's second responsibility was to help Nitricity plan, permit, and install a 50-kW solar array for a remote project. Emily helped draft and submit building permits for the 50-kW solar-fertilizer system, connected with workers at the Fresno County Permit office (daily) to expedite the process, booked travel reservations, ordered parts and steel, maintained a BoM, rented heavy machinery, and crafted a Gantt chart for the entire solar installation process. Looking back now, the Gantt timeline that Emily drafted was fully satisfied on time and under budget. When it came to installation of the solar array, Emily was on the 100°F field for 2-3 weeks working and helping direct our crew. This process included digging 44 6'-deep holes with a skid steer and auger extension, constructing a wooden skeleton structure to hold 21' galvanized steel pipes, pouring concrete, installing steel cross-rails, and attaching 144 solar panels.



Fig. Ms. Emily Wong and a film crew in front of a completed 50-kW solar fertilizer system.

In conclusion, Emily was great to work with and handled considerable responsibilities. I look forward to watching her career. Your business will be competing with Nitricity to offer her employment after she graduates. Please do call or email me any time as a reference check.

Sincerely,

A handwritten signature in black ink, reading "Nicolas H. Pinkowski".

Nicolas H. Pinkowski
[Nitricity Inc](#) | CEO
nico@nitricity.co
(303) 475-6197



Reference Letter for Emily Wong

February 28, 2020

To Whom It May Concern:

This is a general reference letter for Emily Wong. I have known Emily for about 10 months now. She was a student in my 2019 Stanford summer seminar program in Southern France, "The Other France: Troubadours and the Politics of Cultural Heritage." For three weeks we explored various archaeological and historical sites related to the premodern culture of the troubadours and discussed Occitan heritage in the region. Critical analysis of a minor culture within France was an important aspect of this course, and the students were encouraged to develop creative projects. We also encouraged the students to delve into performance practices of dance, music, and theatre.

Emily was a wonderful student in this course because she made an effort to understand medieval culture and its legacy by using her French language skills, her interest in music and performance, and passion for wine. She was a vital part of the seminar group and demonstrated her leadership qualities by encouraging collegiality and camaraderie within the group and with professors and local people. She would energetically participate in our various activities in which we would perform music, sing, or dance medieval pieces. She excelled at grappling with new challenges, whether hiking up to medieval castles and engaging in lectures on Catharism, encountering new food in new places. She exhibited intellectual curiosity and generosity and I was glad to have her model those qualities for our small group throughout our travels.

Emily demonstrated a wonderful talent to throw herself fearlessly into new cultural environments and develop new skills within them. For her final project, Emily interviewed a local winemaker in the area in French—I was impressed by how she developed researched questions on regional wines, viniculture, and food pairings with wine, and how she was eager to apply her French that she had not studied as long as others in the seminar. I appreciated her fearless and jovial attitude and enthusiasm that I rarely see in students that study French over many years. I also appreciated how much thought and effort she put into her final presentation before the students. Her regional wine pairings with food was a brilliant idea that was instructional and fun for the whole group. I hope she can continue her interest in French viniculture and history.

Finally, Emily is gracious, confident, open, curious. She is a wonderful person to have in a group, a good team player who comes with a smile, a willingness to listen as well as ask difficult questions.

Please let me know if you have further questions.

Sincerely,

Marisa Galvez
Associate Professor of French and Italian



January 17, 2021

To Whom It May Concern,

It is my pleasure to strongly recommend Emily Wong for acceptance into your program.

I am Adeesh Goel, the Program Head at Inspirit AI, a pre-collegiate Artificial Intelligence education company founded by graduate students from Stanford University. I have worked with many instructors and program managers over the past couple of years, and Emily's work uniquely stands out among the rest.

Emily joined our team as a back-up program manager, but quickly proved her expertise and became an integral member of our team. As a program manager, Emily was unafraid to step in where needed and find and complete tasks that were left undone. After only a few days of working on our team, I decided to include her in our outreach and innovation teams, where she has also excelled. After a few weeks she was promoted to the Program Manager Team Lead, and is now completely in charge of making sure that all aspects of our programs run smoothly.

One of the things that makes Emily stand out within our organization is the effortless but effective way that she communicates with parents and students. In the month that she has worked with us, she has completely taken over our student and parent inquiries, made several hundred phone calls, and answers emails daily. She does so with speed and thoughtfulness, and takes special care to make sure that each person that asks for her help is given it in full, often emailing for follow-ups to make sure that their issue was resolved.

When we had an instructor drop out last-minute, Emily also took the initiative to gain the qualifications and proficiency of material necessary to become an instructor. In this position, she has taught high school students from around the world foundational concepts of AI and has adapted to different learning styles and cultures to create a

welcoming environment for all. Despite being newer to Artificial Intelligence, through self study she has effectively taught lessons in linear regression, machine learning algorithms, classifications, natural language processing, computer vision, neural networks, convolutional neural networks, AI and ethics, and more. She has additionally been able to work around technical difficulties while keeping course goals in mind and making the difficult curriculum fun to learn. Her flexibility and enthusiasm have made her a favorite instructor among the students.

Instructors and Program Managers who worked alongside Emily found her positivity and cheerful attitude infectious, helping them also to perform at a stellar level -- Emily is a true team player and a pleasure to work with.

If you need further information, please do not hesitate to contact me by email at adeesh@stanford.edu. I would be more than happy to elaborate further on my time working with Emily.

Sincerely,
Adeesh Goel
Program Head
Inspirit AI