**Career Goals**

**Describe your career goals and how this program would help you fulfill them․ (2,000 word maximum)\***

My career goals have been evolving and changing as I navigate through graduate school and experience new technologies and programs which I had never even dreamed of. But The NREIP program aligns very well with two major components of my career goals which have never changed. Firstly, I feel strongly about finding places to work at and people to work with who share a desire to work in meaningful STEM research. Secondly, having a desire to work with others people who share a passion of being a lifelong learners. To further explain, my passion lies in conducting impactful research that addresses real-world challenges. Through NREIP, I would have the opportunity to engage in meaningful STEM research projects directly related to Naval science and technology. This hands-on experience would not only strengthen my research skills but also allow me to contribute to the advancement of critical technologies. Fulfilling my career goals requires exposure to such research opportunities, which NREIP provides abundantly. Additionally, I feel that NREIP provides an excellent opportunity for me to be exposed to others who try to live as lifelong learners. I am committed to pursuing a STEM career, and my ultimate goal is to make meaningful contributions to the scientific community. Participating in NREIP would not only enhance my education but also provide me with invaluable mentorship. Collaborating with laboratory scientists and engineers would allow me to deepen my understanding of STEM disciplines and broaden my horizons. This program would help me fulfill my career aspirations by providing a rich learning environment.

My career goals have been evolving and changing as I navigate through graduate school and experience new technologies and programs that I had never even dreamed of. However, the NREIP program aligns very well with two major components of my career goals that have remained constant.

Firstly, I feel strongly about finding places to work at and people to work with who share a deep-seated desire to engage in meaningful STEM research. This intrinsic motivation to be part of research endeavors that have a tangible impact on society is at the core of my career aspirations. NREIP, with its focus on placing students in Department of Navy (DoN) laboratories where they conduct real Naval research, perfectly aligns with this aspect of my career goals.

Secondly, I have always had a strong desire to work with individuals who share a passion for being lifelong learners. In my view, true progress in science and technology is achieved through continuous learning and adaptation. The NREIP program offers a unique opportunity to be surrounded by individuals who are not only experts in their respective fields but also committed to staying at the cutting edge of knowledge. This is precisely the kind of environment I believe will foster my personal and professional growth.

To further elaborate, my passion lies in conducting impactful research that addresses real-world challenges. Through NREIP, I would have the opportunity to engage in meaningful STEM research projects directly related to Naval science and technology. This hands-on experience would not only strengthen my research skills but also allow me to contribute to the advancement of critical technologies. Fulfilling my career goals requires exposure to such research opportunities, which NREIP provides abundantly.

Additionally, I feel that NREIP provides an excellent opportunity for me to be exposed to others who strive to live as lifelong learners. I am committed to pursuing a STEM career, and my ultimate goal is to make meaningful contributions to the scientific community. Participating in NREIP would not only enhance my education but also provide me with invaluable mentorship. Collaborating with laboratory scientists and engineers would allow me to deepen my understanding of STEM disciplines and broaden my horizons. This program would help me fulfill my career aspirations by providing a rich learning environment that supports my commitment to ongoing education and personal growth.

In conclusion, the NREIP program represents a perfect convergence of my career goals, offering the opportunity to engage in impactful research, work with individuals dedicated to lifelong learning, and contribute meaningfully to the field of STEM. It is the ideal platform for me to further develop as a scientist and engineer while making lasting contributions to the Department of the Navy's research and development efforts.

My career goal: 10 years and 5 years

My career goals have been evolving and changing as I navigate through graduate school and experience new technologies and programs that I had never even dreamed of.

Why

Tough to get there. I want:

-

-

-

Currently, my career goal is to work some place where I can see the development of a technology from infancy to application while working alongside people who are passionate about the technology and excited to see tit through.

1. Introduction
   1. Briefly introduce your long-term career goal.

As I continue to learn and evolve in my academic and professional journey, the specifics of my career goals have proven to be dynamic, adapting to new knowledge and experiences. However, certain fundamental principles remain unwavering, and the path to realizing them is characterized by incremental learning and a perpetual commitment to expanding my horizons.

1. Long-Term Career Goal
   1. Describe your overarching career aspiration:
      1. To work in a place where you can witness the development of technology from infancy to application.

In the next 10 to 15 years, my career goal is to secure a position where I can actively participate in the entire lifecycle of technology development, from its inception to practical application, all while collaborating with a dynamic team of individuals who share my unwavering passion for technology.

* + 1. Emphasize the importance of collaborating with passionate individuals who share your excitement for technology.

In pursuit of this goal, I recognize that the key to success lies not only in my individual efforts but also in the collective synergy of a team united by the same fervor for technology. The value of collaborating with passionate individuals who share my excitement for technology cannot be overstated; together, we can drive innovation, overcome challenges, and ultimately shape the future of technological advancements.

1. Smaller Goals Leading to the Long-Term Goal
   1. Explain the smaller, intermediate goals that contribute to your long-term career goal:

However, I understand that breaking this aspiration into smaller, self-improvement-focused goals is essential for both my personal growth and my journey towards the ultimate objective. These intermediate goals may not be directly related to the end goal, but they serve as building blocks that will lead me in the right direction. By concentrating on smaller, attainable milestones, I can approach the journey with confidence and a sense of accomplishment, making the path to my career aspiration less daunting. These smaller goals include learning to formulate effective research plans, identifying research gaps, and acquiring technical skills in areas such as robotics, electronics, mechanical design, and manufacturing, all of which contribute to my long-term career aspiration.

* + 1. Learning to Formulate a Good Research Plan
       1. Discuss the significance of research planning in technology development.
       2. Highlight how the NREIP program can enhance your ability to create effective research plans.

Effective research planning plays a pivotal role in the realm of technology development. It serves as the foundational blueprint that guides the entire process, ensuring that the project progresses systematically and efficiently. Through well-structured research plans, one can identify clear objectives, allocate resources judiciously, and set realistic timelines for achieving milestones. Moreover, research planning facilitates the identification of potential challenges and risks, enabling proactive problem-solving and adjustment of strategies. It is, in essence, the compass that keeps technology development on course towards its intended destination.

* + 1. Identifying Research Gaps
       1. Explain the importance of recognizing areas where research opportunities exist.
       2. Mention how exposure to diverse projects within NREIP can sharpen this skill.

Recognizing areas where research opportunities exist is a fundamental aspect of driving innovation in technology development. These opportunities often hide in the gaps and uncharted territories of existing knowledge. By identifying these gaps, we uncover the potential for breakthroughs and advancements. These unexplored avenues represent untapped potential for improving existing technologies or creating entirely new ones. In essence, recognizing research opportunities is like discovering hidden treasures that can lead to groundbreaking developments and keep technology at the cutting edge.

* + 1. Acquiring Technical Skills
       1. List specific technical skills you aim to develop (e.g., robotics, electronics, mechanical design, manufacturing).
       2. Explain how NREIP offers hands-on opportunities to acquire these skills.

The NREIP program offers a remarkable array of hands-on opportunities that align perfectly with my goal of acquiring technical skills. Participants in the program are immersed in the dynamic world of Department of Navy laboratories, where they engage in real-world projects across various domains. This exposure provides an ideal environment for skill development. Specifically, NREIP offers access to cutting-edge robotics laboratories, state-of-the-art electronics facilities, opportunities for hands-on mechanical design and prototyping, and insights into advanced manufacturing processes. These resources, combined with the guidance of experienced mentors, provide a fertile ground for me to acquire and refine the technical skills necessary to contribute meaningfully to technology development initiatives.

1. Steps Toward Fostering a Positive Work Environment
   1. Describe your commitment to creating an enthusiastic research team:
      1. Team Collaboration
         1. Emphasize your desire to collaborate with like-minded individuals.
         2. Discuss how NREIP can help you build a network of passionate peers.

My commitment to creating an enthusiastic research team is unwavering, driven by my desire to collaborate with like-minded individuals who share my passion for technology. I believe that the collective synergy of a motivated and enthusiastic team is the cornerstone of successful research and development. The NREIP program offers a unique opportunity to cultivate a network of passionate peers who are equally dedicated to advancing their STEM careers. By actively engaging with fellow participants, sharing insights, and collectively tackling challenging projects, I aim to forge strong connections and lasting collaborations. Moreover, my aspiration is not only to benefit from this vibrant community but also to contribute to a positive work environment within NREIP. I plan to foster motivation and enthusiasm among my peers by encouraging open communication, providing support when needed, and sharing my excitement for technological innovation. Through active participation in NREIP projects and sharing experiences, I aim to inspire and motivate my colleagues, creating a dynamic and uplifting atmosphere that empowers everyone to excel in their research pursuits.

* + 1. Motivation and Enthusiasm
       1. Explain how you plan to contribute to a positive work environment by fostering motivation and enthusiasm.
       2. Provide examples of how NREIP experiences can support this goal.

1. Conclusion
   1. Summarize your career goals and how the NREIP program aligns with them.
   2. Reiterate your enthusiasm for participating in NREIP and the opportunities it offers for personal and professional growth in pursuit of your long-term career objective.

In summary, my career aspirations center around actively participating in technology development over the next 10 to 15 years while collaborating with passionate peers who share my enthusiasm for innovation. The NREIP program aligns seamlessly with these goals by offering a multifaceted pathway towards skill acquisition, research experience, and a vibrant community of like-minded individuals. I am genuinely enthusiastic about the prospect of participating in NREIP, as it provides an invaluable platform for personal and professional growth. It offers the chance to learn, adapt, and thrive in a supportive environment, all of which are instrumental in my pursuit of a career dedicated to shaping the future of technology. I am eager to embrace the opportunities within NREIP, confident that they will propel me closer to my long-term career objective while fostering a passion-driven journey of exploration and discovery.

**Final Response 9/25/2023**

I’m the kind of person who sees a new technology that I would have never dreamed up on my own and am instantly excited out it and want to learn more. I go and ask question after question until I feel I have a good grasp on understanding what I’m seeing and if I don’t feel that way I keep digging on my own. If you could imagine it, I get pretty excited about the things I learn and try to use the creative muscles in my brain to drum up cool ways I could get involved in the technology. So with that being said, I feel like as I continue to learn and evolve in both the academic and professional portions of my career, the details and nuances of my career goals are everchanging as they adapt to new knowledge and experiences. However, certain fundamental principles remain unwavering, and I believe the path to realizing my goals is achievable through incremental learning and a commitment to expanding my horizons. If I was to look at my career goals as of today, and probably over the past six months or so, I would say in the next 10 to 15 years, my career goal is to work my way into a position where I can actively participate in the entire lifecycle of technology development, from its inception to practical application, all while collaborating with a team of individuals who share my passion for technology. I plan to get there by developing both my skills as an engineer over the course of many years. But also I want to make sure I highlight that I understand the key to success lies not only in my individual efforts but also in the collective synergy of a team united by the same excitement for engineering that I have.

For the development of my technical skills to make me both and effective engineer and researcher I think it makes the most sense to break this aspiration into smaller, self-improvement focused goals. The relationship of these smaller intermediate goal might not always be obvious how they relate to my overall career goal and where I want to be, but these intermediate goals serve as building blocks that will lead me in the right direction. Additionally, by focusing on self-improvement goals, I am pursuing skill set rather than a position which will allow me to pivot should my career goal change, or more likely a new opportunity arises that my now developed skill set would fit much better. By concentrating on smaller, attainable milestones, I can approach the journey with confidence and a sense of accomplishment, making the path to my career aspiration less daunting. These smaller goals include learning to identifying potential research gaps, formulate effective research plans, and acquiring technical skills in areas such as robotics, electronics, mechanical design, and manufacturing, all of which contribute to my long-term career aspiration.

As for developing skills as a researcher, I think that identifying areas where research opportunities exist is a fundamental aspect of driving innovation in technology development. Learning how to effectively; read the landscape of state of the art and understanding the research trajectory of both the past and the present in different technology areas is an invaluable skill and helps to drive where the future of research will go. Oftentimes opportunities hide in the gaps and uncharted territories of existing knowledge, but by identifying these gaps, we uncover the potential for breakthroughs and advancements and even creation of new technologies, no matter what their application could be for. These unexplored research avenues represent areas for both improving existing technologies or creating entirely new ones. In essence, recognizing research opportunities is like discovering hidden treasures that can lead to groundbreaking developments and keep technology at the cutting edge. I imagine the DoN laboratories where real cutting edge naval research is happening might be one of the best places to work where I could see professionals and experts in their fields identifying research gaps. I think NREIP provides and excellent opportunity for me to gain access to a work environment where this is commonplace and I would be able to sharpen that skill.

Other types of skills where NREIP would be a great place for me to learn and be exposed to would directly follow the identification of uncharted research trajectories; outlining and developing an effective research plan. Effective research planning plays a pivotal role in the realm of technology development. It serves as the foundational blueprint that guides the entire process, ensuring that the project progresses systematically and efficiently. Unplanned research is often serendipitous and leads to new interesting learnings; however, well-structured research plans, one can identify clear objectives, allocate resources judiciously, and set realistic timelines for achieving milestones. As an intern who spends their school year working on my own research plan, I think I have a good foundational understanding of how to lay out a plan for research. But being surrounded by many different types of research projects, seeing and experiencing how research plans are formed and changed and executed would give me great insight into how they play out over a larger scale. Moreover, research planning facilitates the identification of potential challenges and risks, enabling proactive problem-solving and adjustment of strategies. It is, in essence, the compass that keeps technological development on course towards its intended destination. An important understanding I think I would want for my future career.

Now maybe this next idea seems obvious, but I believe the NREIP program offers a remarkable array of hands-on opportunities that align perfectly with my goal of acquiring technical skills. Participants in the program are immersed in the dynamic world of Department of Navy laboratories, where they engage in real-world projects across various domains. This exposure provides an ideal environment for skill development. Through my program in graduate school, I’ve already had exposure to many concepts that an engineer should be familiar with. Robotics, industrial electronics, PCB design, mechanical design, a plethora of manufacturing processes, and so much more. But for the development of my engineering skills more exposure to tehonolgy and its development would both help me learn faster and be a contributor sooner. NREIP offers access to cutting-edge robotics laboratories, state-of-the-art electronics facilities, opportunities for hands-on mechanical design and prototyping, and insights into advanced manufacturing processes. These resources, combined with the guidance of experienced mentors, provide a fertile ground for me to acquire and refine the technical skills necessary to contribute meaningfully to technology development initiatives.

Overall, My commitment to creating an enthusiastic research team is unwavering, driven by my desire to collaborate with like-minded individuals who share my passion for technology. The NREIP program offers a unique opportunity to cultivate a network of passionate peers who are equally dedicated to advancing their STEM careers. By actively engaging with fellow participants, sharing insights, and collectively tackling challenging projects, I aim to forge strong connections and lasting collaborations. Should I be selected to be apart of the NREIP program, I plan to foster motivation and enthusiasm among my peers by encouraging open communication, providing support when needed, and sharing my excitement for technological innovation. Through active participation in NREIP projects and sharing experiences, I aim to inspire and motivate my colleagues, creating a dynamic and uplifting atmosphere that empowers everyone to excel in their research pursuits.

I really do believe the NREIP program aligns seamlessly with my overarching career goals by offering a multifaceted pathway towards skill acquisition, research experience, and a vibrant community of like-minded individuals. I am genuinely enthusiastic about the prospect of participating in NREIP, as it provides an invaluable platform for personal and professional growth. It offers the chance to learn, adapt, and thrive in a supportive environment, all of which are instrumental in my pursuit of a career dedicated to shaping the future of technology. I am eager to embrace the opportunities within NREIP, confident that they will propel me closer to my long-term career objective while fostering a passion-driven journey of exploration and discovery.

Chat gpt stuff

As I continue to learn and evolve in both my academic and professional journeys, the details and nuances of my career goals have proven to be dynamic, adapting to new knowledge and experiences. However, certain fundamental principles remain unwavering, and the path to realizing them is characterized by incremental learning and a perpetual commitment to expanding my horizons.

In the next 10 to 15 years, my career goal is to secure a position where I can actively participate in the entire lifecycle of technology development, from its inception to practical application, all while collaborating with a dynamic team of individuals who share my unwavering passion for technology.

In pursuit of this goal, I recognize that the key to success lies not only in my individual efforts but also in the collective synergy of a team united by the same fervor for technology. ~~The value of collaborating with passionate individuals who share my excitement for technology cannot be overstated; together, we can drive innovation, overcome challenges, and ultimately shape the future of technological advancements.~~

However, I understand that breaking this aspiration into smaller, self-improvement-focused goals is essential for both my personal growth and my journey towards the ultimate objective. These intermediate goals may not be directly related to the end goal, but they serve as building blocks that will lead me in the right direction. By concentrating on smaller, attainable milestones, I can approach the journey with confidence and a sense of accomplishment, making the path to my career aspiration less daunting. These smaller goals include learning to formulate effective research plans, identifying research gaps, and acquiring technical skills in areas such as robotics, electronics, mechanical design, and manufacturing, all of which contribute to my long-term career aspiration.

Effective research planning plays a pivotal role in the realm of technology development. It serves as the foundational blueprint that guides the entire process, ensuring that the project progresses systematically and efficiently. Through well-structured research plans, one can identify clear objectives, allocate resources judiciously, and set realistic timelines for achieving milestones. Moreover, research planning facilitates the identification of potential challenges and risks, enabling proactive problem-solving and adjustment of strategies. It is, in essence, the compass that keeps technology development on course towards its intended destination.

Recognizing areas where research opportunities exist is a fundamental aspect of driving innovation in technology development. These opportunities often hide in the gaps and uncharted territories of existing knowledge. By identifying these gaps, we uncover the potential for breakthroughs and advancements. These unexplored avenues represent untapped potential for improving existing technologies or creating entirely new ones. In essence, recognizing research opportunities is like discovering hidden treasures that can lead to groundbreaking developments and keep technology at the cutting edge.

The NREIP program offers a remarkable array of hands-on opportunities that align perfectly with my goal of acquiring technical skills. Participants in the program are immersed in the dynamic world of Department of Navy laboratories, where they engage in real-world projects across various domains. This exposure provides an ideal environment for skill development. Specifically, NREIP offers access to cutting-edge robotics laboratories, state-of-the-art electronics facilities, opportunities for hands-on mechanical design and prototyping, and insights into advanced manufacturing processes. These resources, combined with the guidance of experienced mentors, provide a fertile ground for me to acquire and refine the technical skills necessary to contribute meaningfully to technology development initiatives.

My commitment to creating an enthusiastic research team is unwavering, driven by my desire to collaborate with like-minded individuals who share my passion for technology. I believe that the collective synergy of a motivated and enthusiastic team is the cornerstone of successful research and development. The NREIP program offers a unique opportunity to cultivate a network of passionate peers who are equally dedicated to advancing their STEM careers. By actively engaging with fellow participants, sharing insights, and collectively tackling challenging projects, I aim to forge strong connections and lasting collaborations. Moreover, my aspiration is not only to benefit from this vibrant community but also to contribute to a positive work environment within NREIP. I plan to foster motivation and enthusiasm among my peers by encouraging open communication, providing support when needed, and sharing my excitement for technological innovation. Through active participation in NREIP projects and sharing experiences, I aim to inspire and motivate my colleagues, creating a dynamic and uplifting atmosphere that empowers everyone to excel in their research pursuits.

In summary, my career aspirations center around actively participating in technology development over the next 10 to 15 years while collaborating with passionate peers who share my enthusiasm for innovation. The NREIP program aligns seamlessly with these goals by offering a multifaceted pathway towards skill acquisition, research experience, and a vibrant community of like-minded individuals. I am genuinely enthusiastic about the prospect of participating in NREIP, as it provides an invaluable platform for personal and professional growth. It offers the chance to learn, adapt, and thrive in a supportive environment, all of which are instrumental in my pursuit of a career dedicated to shaping the future of technology. I am eager to embrace the opportunities within NREIP, confident that they will propel me closer to my long-term career objective while fostering a passion-driven journey of exploration and discovery.

In the ever-evolving landscape of science and technology, the importance of setting clear and ambitious career goals cannot be overstated. As I navigate my academic journey and gain exposure to the dynamic world of research, my career goals have evolved alongside my expanding knowledge and experiences. While specific details may shift, certain fundamental principles have remained steadfast in shaping my vision for the future. In this essay, I will outline my long-term career goal, which involves actively participating in technology development over the next 10 to 15 years, all while working alongside passionate individuals who share my unwavering enthusiasm for technology.

My overarching career aspiration is to secure a position where I can be actively involved in the entire lifecycle of technology development, from its inception to practical application. This career goal is driven by an unwavering passion for technology and a deep-seated desire to contribute to the ever-advancing world of science and innovation. I envision a future where I play a vital role in the process of conceiving, designing, developing, and implementing groundbreaking technologies that have a tangible impact on society. However, what truly fuels my drive is the prospect of working with a dynamic team of individuals who share my enthusiasm for technology. The collaborative synergy of a passionate team is, in my view, the driving force behind transformative technological advancements.

Breaking down this long-term career goal into smaller, self-improvement-focused steps is crucial for making the journey more manageable and less daunting. While these smaller goals may not be directly tied to the ultimate objective, they serve as essential building blocks on the path to realizing it. They also facilitate continuous personal growth, which is integral to staying on course.

Effective research planning is the cornerstone of successful technology development. It involves crafting a comprehensive strategy that outlines the objectives, methodologies, resources, and timelines for a research project. This skill is vital because it ensures that the project progresses systematically and efficiently, identifying potential challenges and mitigating risks along the way. By mastering research planning, I will be better equipped to steer technology projects toward successful outcomes.

Recognizing areas where research opportunities exist is another critical skill for driving innovation in technology development. These opportunities often hide in the gaps and uncharted territories of existing knowledge. Identifying these gaps allows for the discovery of potential breakthroughs and advancements. In essence, recognizing research opportunities is akin to finding hidden treasures that can lead to groundbreaking developments and keep technology at the forefront of progress.

To actively participate in technology development, it's imperative to acquire specific technical skills. These skills are the tools of the trade, empowering individuals to conceive, design, prototype, and produce innovative solutions. In my case, the technical skills I aim to develop include robotics, electronics, mechanical design, and manufacturing. These areas of expertise are integral to modern technology development and will enable me to contribute significantly to research projects and bridge the gap between concept and practical application.

The Naval Research Enterprise Internship Program (NREIP) is a pivotal catalyst in my journey toward realizing these career goals. NREIP provides a rich learning environment where I can acquire hands-on experience, develop critical skills, and collaborate with experts in the field. Here's how NREIP enhances my pursuit of each smaller goal:

NREIP exposes participants to real-world research projects within the Department of Navy laboratories. This firsthand experience in crafting research plans, setting objectives, and executing methodologies will sharpen my ability to formulate effective research strategies. By working on projects that have direct implications for naval science and technology, I will gain insights into best practices for research planning.

Participating in the NREIP program offers a diverse array of projects, each presenting unique research challenges and technological frontiers. Engaging with these projects allows me to refine my ability to identify research gaps and unexplored avenues. By working on projects that span different disciplines and applications, I will develop a keen sense of where research opportunities exist.

NREIP provides access to cutting-edge robotics laboratories, state-of-the-art electronics facilities, opportunities for hands-on mechanical design and prototyping, and insights into advanced manufacturing processes. These resources, coupled with the guidance of experienced mentors, offer a fertile ground for me to acquire and refine the technical skills necessary to contribute meaningfully to technology development initiatives.

My commitment extends beyond personal growth; it encompasses the creation of an enthusiastic research team. I firmly believe that the collective motivation and enthusiasm of a team are the cornerstones of successful research and development. NREIP can contribute to this commitment in several ways:

NREIP fosters a dynamic community of like-minded individuals who are passionate about science and technology. Collaborating with such a network of peers can be incredibly motivating and inspiring. As I engage with fellow NREIP participants, I plan to share insights, exchange ideas, and build relationships that extend beyond the program's duration. By actively participating in NREIP projects, I aim to inspire and motivate my colleagues, creating a dynamic and uplifting atmosphere that empowers everyone to excel in their research pursuits.

Additionally, NREIP exposes participants to a diverse range of projects, each offering opportunities to collaborate with experts in the field. These collaborations will not only enrich my own understanding but also enable me to contribute positively to the research teams I join. Through open communication, constructive feedback, and a shared commitment to innovation, I aim to foster a positive work environment that fuels motivation and enthusiasm among my peers.

In conclusion, my career goal of actively participating in technology development over the next 10 to 15 years is driven by a passion for innovation and a desire to collaborate with like-minded individuals. The NREIP program aligns seamlessly with these goals by providing a wealth of opportunities for skill development, research experience, and networking. I am genuinely enthusiastic about the prospect of participating in NREIP, as it offers a platform for personal and professional growth. It presents the chance to learn, adapt, and thrive in a supportive environment, all of which are instrumental in my pursuit of a career dedicated to shaping the future of technology. I am eager to embrace the opportunities within NREIP, confident that they will propel me closer to my long-term career objective while fostering a passion-driven journey of exploration and discovery.

**Academic Interests**

**Describe any special interests you have that would make you a valuable participant․ (2,000 word maximum)\***

From an academic perspective I am interested in STEM and Engineering and my research for grad school has been focused in additive and advanced manufacturing which I find super interesting. My area of study is specifically around large scale metal additive manufacturing which gives me a good background in controls, electronics, material science, data analysis and some other good research practices. These skill areas honed by my focus on advanced manufacturing as a skill. This makes good. Fix this sentence.

I’ve gotton interested in supply chain disruption and decentralization of manufacturing in the world. I assume Carderock does research related to supply chain robustness for deployed forces.

**Research Experience**

**Describe any research experience you may have in relation to this program, including any STEM afterschool programs, camps, or competitions in which you have participated․ (2,000 word maximum)\***

My research experience consists of over two years of research in an additive manufacturing lab at my university.

I’ve participated in research going into my 3rd year now at my universities additive manufacturing lab. I’ve worked on a number of projects including carbon fiber repair, multi-modality additive components and metal additive manufacturing to name a few. AI in manufacturing, large format polymer printers and design challenges. A combination of fundamental research and engineering went into these projects.

The metal AM project involved hybrid wire arc additive manufacturing (hWAAM) and its cool.

My relevant experience in relation to reserach

1. Introduction
   1. Briefly show a summary of research experience from an overall perspective (ie. I do research in science/ engineering)
   2. List of experiences
      1. Engineering Education
      2. DREAMS Lab
         1. Undergraduate
         2. Graduate
2. Engineering Education
   1. Describe the motivation behind:
      1. To see what collaboration in engineering looked like in a remote environment.
   2. Takeaways
      1. Learning to Formulate a Good Research Plan
      2. How to conduct an experiment
      3. How to interpret results
      4. Writing a paper / going to a conference
3. DREAMS lab – undergraduate
   1. List of projects:
      1. AON
      2. Luna
      3. Pressure multiplier
4. DREAMS lab - Graduate
   1. Metal AM (hWAAM)
      1. Physics Stuff
   2. Other Projects
      1. Robotic AM
      2. Large Scale AM
      3. Direct ink write print building
   3. GE Research
      1. Literature Review
      2. Technological development for research applications
5. Conclusion
   1. Summarize how the NREIP program overlaps with and compliments your previous research experience.
   2. Reiterate your enthusiasm for participating in NREIP and the opportunities it offers for personal and professional growth in pursuit of your long-term career objective.

Over the past four years, my research endeavors have encompassed a diverse spectrum of projects, ranging from human subject research focusing on engineering education applications to intricate modifications and advancements in additive manufacturing systems. A recurring theme in these projects has been my unyielding commitment to in-depth exploration, seeking a comprehensive understanding of the subjects under investigation.

My initiation into the realm of research coincided with the challenging circumstances brought about by the COVID-19 pandemic during my junior year of undergraduate studies. As I witnessed the educational landscape transition to online platforms, it sparked my interest in the tools that could facilitate seamless collaboration and enhance remote work for engineering teams. To pursue this, a fellow student and I co-authored a research proposal, which we presented to a professor in the engineering education department. This proposal received sponsorship for a three-year research project, marking my inaugural research experience.

This first project in research ignited my passion for further exploration and subsequently led me to my current pursuit of a Ph.D. in mechanical engineering within the DREAMS Lab. During my tenure in this lab, I have engaged in a wide array of projects, including the development of a multi-modality 3D printer, robotic laser welding, and the modification of a hybrid wire arc additive manufacturing machine.

Several years ago, I embarked on a research journey focused on engineering education. This initiative aimed to assess the efficacy of specific online tools for engineering education projects, enhancing collaborative teamwork among students. The success of students in staying organized and their performance in teamwork metrics were meticulously analyzed as they utilized various online tools for communication and collaborative project tasks. My motivation for this project stemmed from a keen interest in the evolving landscape of collaboration, particularly in the post-COVID era, where tools like Zoom, Dropbox, and Microsoft Teams have gained prominence, making remote work a standard practice for many engineers. The experiment revealed the effectiveness of certain tools for remote collaboration while highlighting challenges related to cost and cloud service availability in an educational setting. Beyond the outcomes of the study, the research experience enriched me with essential skills. I honed the art of crafting well-defined research questions and constructing comprehensive research plans, providing insights into the rationale behind observed results. The development of experimental plans and data processing methods has proven to be an invaluable asset throughout my academic journey.

Following this initial research exposure, my senior year brought new opportunities. While continuing my work on the engineering education project, I joined our school's additive manufacturing lab, known as the DREAMS Lab, which stands for Design Research and Education in Additive Manufacturing Systems. Here, I engaged in diverse projects. Notably, I was tasked with designing and fabricating a direct ink write head capable of operating under elevated environmental temperatures while effectively managing material temperature. This project instilled in me the ability to identify technological gaps in existing literature and understand the direct ink write process. It also provided me with insights into the influence of heated chambers on the thermal profile of the printing process. Armed with this knowledge and a clearly defined problem statement, I embarked on the endeavor to create a new multi-modality heated environment printer. This experience not only heightened my enthusiasm for undergraduate research within the DREAMS Lab but also led me to contribute to another project centered on conformal carbon fiber compaction. Proposed by an external company, this project enabled me to work on a controls project that incorporated robotics and carbon fiber layup. The project deepened my understanding of robotics and imparted knowledge in controls and mechatronics principles, which I continue to leverage in my current research. This experience, though rooted in engineering, unveiled the diverse range of opportunities and technologies available for further exploration within the DREAMS Lab, should I choose to pursue graduate studies.

Motivated by this newfound inspiration, I applied for a master's program at Virginia Tech, continuing my research journey within the DREAMS Lab. This phase of my academic journey introduced me to Wire Arc Additive Manufacturing (WAAM), a metal 3D printing process closely related to welding. Prior to graduate school, I had no experience in metal additive manufacturing, making it a novel challenge in an unfamiliar domain. However, my prior experiences, including the development and execution of research plans through my engineering education project and work within the DREAMS Lab, provided me with a solid foundation for success in graduate-level research. I embarked on an extensive literature review to comprehend the intricacies of the technology, typical processing conditions, and areas where knowledge gaps existed. This review enabled me to shape my research scope and define my contribution within the WAAM research landscape, demonstrating the cumulative growth of my research skills.

At present, my research focuses on examining how the thermal history of a part impacts grain growth when employing specific build strategies in WAAM. I firmly believe that my prior research experiences have endowed me with the capabilities essential for effective research, an asset that would greatly benefit me as an NREIP intern. I bring to the program a robust background in developing strategies for uncovering new research opportunities, identifying gaps in existing research, and formulating well-structured research plans. Moreover, I recognize the numerous opportunities within the NREIP program to apply my research skills, including literature review, project proposal and reporting, and unwavering attention to detail in research execution. My extensive background positions me well for success within the program.

**Technical Skills**

**Describe any technical skills you may have which are related to the science and engineering disciplines․ (2,000 word maximum) \***

Over my time in university, I’ve learned quite a few technical skills. They include fundamental knowledge from classes like controls theory, material science and thermodynamics. As well as math, numerical method solving, heat and mass transfer and fluids. But I have also developed skills outside of the theoretical field which land closer to practical application. I’ve been developing these skills by taking on projects both for my research, for other student groups and personal projects. I’ve learned many electronics skills including circuit design, PCB design microcontroller programming, and industrial electronics. I’ve learned manufacturing skills like CNC machining, polymer additive manufacturing, metal additive manufacturing, different welding modalities and laser cutting. To design the projects where I developed some of these skills I’ve learned CAD software including Fusion, Solidworks, Inventor and NX as well as the CAM software available for these CAD software’s. I’ve also developed many robotics systems and done programming and alterations to robotic systems ranging from gantry systems to 7 and 8 degree of freedom robotic arms. Many of these projects require complex math and programming so I am also very familiar with effective programming structures and system architectures. Most commonly I use python and C++ for my projects but I would be open of course to learning more.

1. Introduction
   1. Describe that I’ve been developing technical skills that relate to science and engineering long before my time studying at university.
      1. Thorughout my life I’ve had a fascination with building thing and understanding how things worked. I’ve gone through phases working with electronics, metal working, automotive and wood working and that’s all before even applying to a college.
   2. Talk about how time spent in college has given me a nice understanding of the theory and fundamentals behind some of the skill I have already acquired.
      1. Controls theory
      2. Material science
      3. Thermodynamics
      4. Mathematical concepts
      5. Numerical method solving
      6. Heat, mass transfer, and fluid dynamics
   3. Talk about phases I my life where I found certain things interesting and pushed me to develop technical skills on my own outside the classroom:
      1. Electronics Skills
         1. Circuit design
         2. PCB design
         3. Microcontroller programming
         4. Industrial electronics
         5. Soldering
      2. Manufacturing Skills
         1. CNC machining
         2. Polymer additive manufacturing
         3. Metal additive manufacturing
         4. Welding modalities
         5. Laser cutting
      3. Computer-Aided Design (CAD)
         1. Proficiency in CAD software
            1. Solidworks, NX, Fusion, Inventor
      4. Robotics Skills
         1. Robotics system design
         2. Programming and alterations
         3. Range of applications from gantry systems to robotic arms
      5. Programming Skills
         1. Competence in Python and C++
         2. Willingness to learn and adapt to new programming languages
2. Conclusion
   1. Summarize the significance of the technical skill set.
   2. Emphasize adaptability and passion for continued learning and contribution to STEM fields.

Engineering skills are the product of a complex blend of critical thinking, unwavering determination, and a well-rounded technical prowess. The crux of these skills lies in the ability to analyze problems critically, persist through challenges, and adapt to learn new skills and concepts when the need arises. While critical thinking and grit are the cornerstones, the technical side of engineering and scientific knowledge, when cultivated effectively, can significantly expedite the engineering and research processes. The development of these technical skills is not just a part of my academic journey; it's a lifelong passion that has shaped me into the engineer and researcher I am today.

My affinity for technical skills began early in life, driven by an insatiable curiosity to build and understand how things functioned. Long before I stepped into a college classroom, I embarked on a multifaceted exploration spanning various domains, including electronics, metalworking, automotive, and woodworking. These early experiences laid the foundation for my educational and professional endeavors. Crafting Halloween costumes from scratch using cardboard, tape, and household items was just the beginning of my hands-on journey. Beyond costumes, I tackled more complex projects, such as constructing air cannons, water guns, and even potato launchers. These ventures led me to explore the principles of gas expansion, water pressure, and fluid flow restrictions. Through experimentation and perseverance, I acquired skills in soldering and circuitry.

My high school years marked a pivotal stage in my development. Like many young enthusiasts, I became engrossed in automotive technology. I delved into engine mechanics, suspension systems, and sensors, providing me with profound insights into the intricacies of mechanical systems. This practical knowledge laid the foundation for much of my engineering skill set, and I found myself further inspired to explore the vast and evolving world of engineering.

These experiences were instrumental in preparing me for college, where I transitioned from hands-on projects to a more theoretical understanding of engineering concepts. I engaged with subjects like control theory, material science, thermodynamics, fluid dynamics, and numerical methods. These theoretical underpinnings not only complemented my practical skills but also provided a deeper understanding of the principles governing the technologies I had explored earlier.

With an automotive background and a few years of university education under my belt, I eagerly embarked on my first internship, working with a small company specializing in semi-truck modification. This experience introduced me to the world of welding, machining, and CAD/CAM software. It was my first exposure to Autodesk Inventor, a new software for me, as my prior projects predominantly utilized SolidWorks. During this internship, I honed my skills in pneumatics and air pressure control for non-electrical systems. I also delved into the development of wiring harnesses designed to function within the capabilities of the stock software running on the trucks. These projects were not only a practical application of my skills but also a window into how technical skills could be applied in real-world engineering and scientific contexts.

Subsequent years in school saw my participation in an interdisciplinary capstone design class, which involved industrial robotics. The project aimed to automate monotonous and unnecessary tasks, alleviating workers from repetitive labor. In the context of industrial robotics, I gained substantial experience in robotics, computer vision, and closed-loop control systems. This project served as an opportunity to refine my skills in PCB design, C++ programming, and Python coding. Material selection for the robotic end effector was another dimension of the project, emphasizing the importance of materials science in practical engineering. The project was a comprehensive showcase of my technical skills, particularly in controls, microcontroller wiring, and programming. It was during this project that I was exposed to different types of robot toolpathing solutions, which led to my burgeoning interest in inverse kinematics, an area I'm actively working to develop as a technical skill.

In my present endeavors, I've found myself at the cutting edge of technology. My work in an additive manufacturing lab has provided me with a platform to refine a cross-section of technical skills relevant to additive manufacturing and research. Additive manufacturing research is a captivating realm, especially when I'm involved in the design and construction of the very machines we use for research. Here, I'm tasked with mastering mechatronics and controls programming to not only build but also modify our lab equipment as needed. Additionally, understanding the intricacies of materials processing is vital in the additive manufacturing field. As we repeatedly deposit and build materials, my research delves into how material processing affects the mechanical performance of the built parts. Furthermore, there are the challenges of CAM (computer-aided manufacturing) and robotic toolpathing, requiring a deep understanding of both the machines' capabilities and the functionalities of CAM software. This ensures that experiments using the machines are designed and executed successfully.

In the context of my research, extensive data processing and statistical analysis play a pivotal role. Python programming forms the backbone, allowing me to synthesize and present results in a clear and concise manner. Moreover, I've ventured into the realms of machine learning and artificial intelligence, harnessing these tools to expedite my research. Using machine learning algorithms like support vector machines, random forest trees, and neural networks, I seek to identify trends and establish connections between physical phenomena and the data generated by our lab equipment. While I am still in the process of developing these technical skills, my understanding of machine learning and its application in a technical context continues to grow daily.

Having cultivated a broad technical skill set has been instrumental in my journey as a successful engineer and researcher within the educational sphere. Yet, my thirst for knowledge and the inherent challenges in engineering and science keep me eagerly exploring new horizons. With an ever-growing skill set, I eagerly seize opportunities like NREIP, which expose me to new environments, intricate technical challenges, and the company of creative and seasoned engineers. These experiences not only enrich my knowledge but also push me to develop new and formidable skills that I can apply to my research and engineering in the future. As I embrace these opportunities, my journey as an engineer and researcher continues to evolve, leading me down exciting paths of innovation and discovery.