Starlink starshield GNC

SpaceX was founded under the belief that a future where humanity is out exploring the stars is fundamentally more exciting than one where we are not. Today SpaceX is actively developing the technologies to make this possible, with the ultimate goal of enabling human life on Mars.

DRONE \*\* I had to make the drone tilt a little to make it spin in simulation and I had set my z command incorrectly.

**Why Space X?**

I look for companies that can benefit our society the most because that is my professional goal. From my previous internship, I had a chance to lead a project to help HVAC technicians, and the magnitude of impact that I realized that I could have as an engineer as well as the appreciation that I received for helping them was so rewarding that I wanted to seek greater work that can benefit greater society. And I believe spaceX shares that desire with me. Global warming is the biggest problem, and I truly think planet colonization is one of the solution, and the ultimate goal of space X is to enable human life on Mars to ensure long-term survival of human speice. I would love to contribute to that goal in any form as possioble

Why this job?

**Tell me about yourself**

I am an Integrated masters student at University of texas at austin. My major is mechanical engineering with emphasis on Dynamics systems and control. First I want to point out the relevant courses on my resume.

This position looks for a person with experience in real-world development in GNC system or any expericen ce debuggin software that has been used in real-world applications/projects which I have done in Blue Orgin as a GNC engineering intern, in which I helped develop a rocket simulation that is used in the software-in-the-loop process. I am also currently a GNC engineering intern at Sandia developing simulations there as well. This job also requires experience in C++, which I gained proficiency and experience through a drone project in my aerial robotics course, in which I devleoped a path algorithm for my team’s drone to go to the balloon so it can pop them.

With these experience I just mentioned, I got use a lot of Git to collaborate with other engineers. Share work, and communicate cosntantly that are essential for any engineers. Besides that in other courses, have taken many controls courses for the last few years, which gives me agood fundameltal knowledge on classical controls concepets. I have learned to model mechanical systems, derive a transfer function and analyze the system’s stability, observability and controllability.

I also took the fundamental orbital course in which I learn about the fundamental orbital mechanics and how orbiting objects like the space station and the crew capsule rendezvou. Lastly, I am currently taking a GPS course learning about how GPS communicates.

I can also go on and explain the my leadership experience with Southwest Research Institute, later as well. And my experience at Trane tehcnolgies. But

I think if you are looking for a person with a knowledge in orbital mechanics, modeling and simulation with software skills in C++ , MATLAB . Also, solid Controls background knowledge and communication skills, I will be a great fit.. So with my strong passion in space and a solid background in controls, I believe I can contribute to this GNC position for Dragon

**Explain a time when you had to use logic to solve an engineering problem**

My team and I were tasked to make a product to help grocery shopping. The entire process was based on logic. WE first went through surveys and interviews to indentify the problems the grocers were having and we wanted to decide on our problem statement. We did HoQ to come up with specifications for our design. I was mainly responsible for the selection of our structure. We three different materials we can get hold of, and I ran FEA based on the estimasted stress that our structure will experience and considered cost and how fast we can get hold of them, and I suggested to our team that we go with wood. Then we went through pugh chart, and protoypes to finish our product.

**Military-** In Korean military, there is quarterly, squad team qualificaition test that measures the team and the individuals’ abiltiy to operate missions. So physical tactical, and other miltiary basics a solider should know. On the team missions, for the first two quarters I took, we could not get that above 90 points that we needed for our company’s goal. those two first times, it jsut seemed like coordinating the entire squad was hard, the directors for the tests seemed just harsh for no reason. I wanted do something for us change our squad’s performance. So When I rose to the rank when I can start commanding other fellow soliders, I started discussion sessions within the squad before we took a test. we came up with the plans together, rehearse them. talking about each other’s movements, strategeis, tips they have heard over the months. This really solidfied our operation during the test and we did recieve that high performance grade that we needed. IT was really an accomplishment for us. From that I learned that it’s just a discussion and the planning together is what makes a huge differenece and gave us the result we wanted. All we needed to do was communicate among us. and I think Engineering is not much different from that. Communication is the key and discussions are wehre we find solutions in any engineering roles and projects. I have been working since to communciate and at the same time lead my team members through verbal communication in any engineering projects

**Samsung**

This was my internship two summers ago. The work I did there was not something I expected, but it was a chance for me to learn an entire new thing from the start and apply to work right away. In my life, I ve never coded before, I did not how to make websites. But during that internship I was tasked to learn Javascript, HTML, CSS SQL, VBA and all to create a website and excel tools that helps technicians report failures and record manufacturing data without error and quickly.So I learned all those and at the end I presented my work to engineers and especially the technicians. It was really rewarding again to see technicians appreciating my work and seeing my work at practice. I believe it is still functional in the semiconductor fab right now saving about 1 hour for each of the technicians every shift. I also gained confidence that I can learn new things and quickly adapt to it as well. I am sure there will be new knowledge that I need to learn working at SpaceX as well, so I want to show here that I have an open mind set to learn and will learn and apply my learnings in this GNC position.

**Trane**

just like any other work, I think communication is essential in engineering. This experience at Trane technologies I showcase my communcioations skills. I led a qualification project for a new HVAC component. It required me to have consistent communication with the supplier, UL representative, senior engineers and technicians.

This was my first professional engineering experience. Among couple of things I was responsible for, most memorable was a component qualification project. I led the project, and the product had potential to save installation time for technicians by 25%, and I had to test its performance, check its standard compliance, and price to help the company decide whether to use this product or not. This type of product was not a typical component in HVAC, so I had many discussions with other professional engineers on how to test the performance and interpreting the standard. I also met with manyh technicians to receive their feedback reflect them on the methods of testing.I have also come up with a safety measure incase the component fails during tests. I Experimented the safety measure and showed other engineers that it does perform properly as a safety measure. At the end, with everyone’s help through communication, I was able to qualify this component that reduced the HVAC installation time by 25%.

I loved this project, it was really fun coming up with my own tests, interacting with actual users of the product, technicians, and learned alot from other engineers. It was great chance to show my written and verbal communication skills and was great leadership experience that I believe you guys are looking for this position.

**Guadaloop**

I was the lead suspension engineer for the team last semester. First of all, the team’s design when I became the lead did not have sufficient engineering justification. Meaning, We did not run a thorough stress, cost analysis, etc., so we could not answer anyone who asked why our suspension is built this way. So I scrapped the entire design and began from the scratch. Just like I had done in other design courses, I led the suspension team to take methodical approach to clarify performance specification, brainstorm, picking a design and analyze our selection. We used Pugh charts, gantt charts, multiple sessions of 6-3-5 method, and ran stress analysis through FEA. All these activities provided a solid justification for our team’s design, and if anyone asks why certain things were designed such a way, we could give them a sufficient engineering reason. They involved lots of communications and especially, the FEA required lots of background knowledge in Statics and dynamics. So at the end of the last summer, the team created a CAD of Gudaloop’s suspension along with documentation of the entire engineering process and its justification. The team just has to manufacture it now!

**Grocery-**

My team and I were tasked to make a product to help grocery shopping. WE first went through surveys and interviews to indentify the problems the grocers were having and to dfine a specific problem statement. What is our design going to achieve. And we concluded that our design has to reduce the time it takes for people to check out their groceries. We did HoQ to come up with specifications for our design. When specifications were set, I was mainly responsible for the selection of the materials for our structure. We had three different materials we can get hold of, and I ran FEA based on the estimasted stress that our structure will experience and considered cost and how fast we can get hold of them, and I suggested to our team that we go with wood. Then we went through pugh chart and other brainstorming sessions to finalize our design, and we created a prototype to finish our product. Because this project ran on a timely schedule and was a team project, I think this is another hands on project experience that demonstrates my ability to deliver necessary work on time and work as a team, which will also be qualities necessary as an intern at Blue.

**Senior Design Project**

The team I led was tasked with designing an impact test machine for equipments on naval ships. Because we were designing such a big system from the ground up in three months, the project was very timeline driven. Projects like these, I think it is important to have every member on the same page without much confusion. If the team is confused, it delays the time for it to do actual work on the project. In order to reduce such misunderstandings and miscommunications, at the end of every meeting, I clarified action items and their due dates for everyone, so everyone knew what to do and made progress on the project until the next meeting. Also, I stayed open minded as a team leader. When a member thought that he could not finish his work in time, I discussed about it before the due date with the team and tried to see if we can distribute the work or reach out to our sponsor and the faculty to see if such extensive study was necessary given the time. At the end, we successfully met every single deadlines and produced a CAD model of the machine. So, With this senior design project, I helped my team deliver the deliverable on time and stayed open minded to run the project efficiently, which I believe are part of two of the core principles of leaders at Blue.

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Problem solving skills - SwRI project.

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**Guadaloop**

Though I was in the team since 2021, my engineering work only started earlier this year. I joined the suspension team spring 2022, and was responsible for stress analysis and manufacturing of suspension system. We had a quite tight schedule when I joined back. We had to finish building this and send it to Neatherlands this summer. Our suspension had to hold the entire weight of the pod when it is not running or the levitation mechanism fails. So I ran Finite element analysis on SolidWorks for shaft, mounts, and wheels to see if our design can withhold. Some parts didn’t hold up, so we increased the size of the shaft or looked into other materials to accodamte the weight. When we verified the design through FEA, I used lathe machine and drill presses to manufacture our actual suspension referencing the parts drawing has all the GD&T (geometric deimensioning and tolerancing). And created the suspension in time. And this one again shows the ability to efficiently build parts on schedule and shows my understanding of GD&T that’s required for this position.