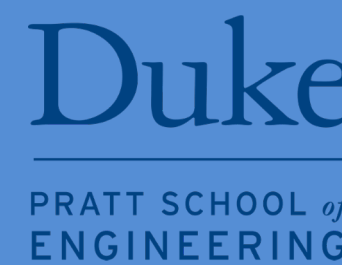




# Boeing Engineering Summer Internship

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## Introduction

This past summer, I interned at Boeing as part of the Environmental Control Systems (ECS) organization, on the Product Development team. This team is responsible for systems of the aircraft involving pressurization, air distribution, and fire/ice protection. My team was in Everett, WA which is about 30 minutes north of Seattle.

Due to the global pandemic, my internship was made completely remote, and I was not able to visit the facility in person. I was able to stay at my off-campus apartment in Durham over the entire summer.

Unfortunately, because all my work was Boeing Proprietary and contained sensitive company information, I am limited in the level of details I can discuss and unable to include any photographs.

My goals for my summer internship this year were:

- Apply the concepts and skills that I had learned in the last 3 years of Mechanical Engineering at Duke.
- Develop strong relationships with my team.
- Network with other engineers across several company organizations.
- Narrow down an area of interest for my future career in engineering.
- Receive a return offer to potentially join the company full-time after graduation.

## Challenges

- Working virtually from home:
  - Not getting to see airplane systems in person made it harder to learn and understand what I was working on.
  - Working on Eastern Time was a difficult adjustment.
  - It was harder to get to know my coworkers on a personal level.
  - “Zoom”/Computer Fatigue
- Learning curves for CATIA/FloEFD and Decompression Analysis

For my first project, I performed Computational Fluid Dynamics (CFD) studies using CATIA/FloEFD to analyze air distribution performance of potential nozzle designs and advise on future development. CFD studies were something I had learned to do at Duke and was able to test my skill in industry application with this project.



For my second project, I furthered development of the Decompression simulation model by converting scripts from Fortran to MATLAB and validating results. A decompression event is when the airplane metal body experiences fatigue after many cycles of landing and takeoff, which can lead to catastrophic damage during flight. With this project, I obtained experience with a widely-used industry programming language and saw firsthand how data-based numerical models are made and improved.



*Aloha Airlines Flight 243, an example of a decompression event (April 28, 1988)*

For my last project, I collaborated with other interns to develop a dynamic model of airplane engine bleed in Simulink by mathematically modeling ducts/users and implementing various control systems. This model allowed me to apply what I had learned in Thermodynamics and Controls over the past school year! This was a great opportunity for me to work with other interns from across the country to solve problems and develop the model.



## Conclusion

After the conclusion of my time at Boeing, I:

- Gained a lot of experience on CAD, CFD, MATLAB, Simulink, and Excel.
- Successfully closed three projects with various deliverables.
- Learned a lot about the airplane and defense industries.
- Had the opportunity to virtually tour several Boeing facilities and products.
- I got to know a lot of awesome colleagues at Boeing!
- Through networking, I learned about a lot of areas within and outside of ECS. Helped to zero in on my career interests.
- Expanded my network of professionals within the Society of Hispanic Professional Engineers at Boeing.
- Practiced time management/project skills different than those in school.
- Present my work and discuss my progress/career with organization leaders and hiring managers.

## References

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