

# What ISE students did last summer

*Interns share stories of their on-the-job experiences*

## Disney World position offers a magical learning opportunity

By Dina Perlic

*University of Pittsburgh, IISE Member*

**S**earching for an internship can be an intimidating process for a college student. Being a part of IISE provided me with the resources to find an internship that matched both my skill set and my interests.

As an industrial engineering student at the University of Pittsburgh, I had the opportunity to attend the 2018 IISE Annual Conference in Orlando. At the student networking mixer, I was able to connect with an industrial engineer from Disneyland. I am a huge fan of the Disney parks and was eager to learn her role in creating a magical experience for guests.

I attended a variety of presentations on industry topics at the conference, which included two presentations from Disney industrial engineers. This inspired me to apply online for their professional internship program. After applying and going through the interview process, I was ecstatic to receive an offer to intern as an industrial engineer at Walt Disney World in summer 2019.

Industrial engineers at Disney create magic through efficiency. They use analytics to provide internal consulting support to various lines of business, including attractions, merchandise and entertainment. During my internship, I was the line of business intern for merchandise and entertainment. My first project consisted of analyzing transaction times at a Magic Kingdom merchandise location to validate labor standards. I also had the opportunity to work on a project looking at the distribution of annual passholder magnets and its impact on conversion, the ratio of transactions to foot traffic.

For the entertainment line of business, I analyzed historical character performer data to determine trends for some of my favorite Disney characters. Additionally, I created an app in Microsoft PowerApps that is now used daily in the performer feedback process.



Photo courtesy of Dina Perlic

**Dina Perlic, an industrial engineering student at the University of Pittsburgh, spent her summer working as an intern at Walt Disney World in Orlando, Florida.**

My internship with Disney challenged me to grow both personally and professionally. Prior to my internship, I did not have much experience in taking charge of my own projects. However, at Disney you are encouraged to take initiative to ensure your projects are moving forward toward completion. The projects that interns lead are those that would be done by an industrial engineering department regardless of interns, making it rewarding to take ownership over projects and know they will make a real difference.

Each intern is paired with a coach or a full-time IE to

provide project guidance and give performance feedback in addition to the department providing other resources to help you succeed. Training courses on Excel, FileMaker and PowerApps helped build my technical skills, while classes on project scoping and professionalism helped build my soft skills. I was able to directly implement what I learned from these intern trainings into my project work.

Being a part of the Disney internship program includes some awesome perks, including free admission to all the Disney parks, discounts on restaurants and hotel stays and complimentary tickets for family and friends. The other summer interns and I were able to take part in cast preview days for the Gran Destino Tower, the NBA Experience and Star Wars Galaxy's Edge.

When I wasn't exploring Disney property, I was visiting places around the Orlando area such as beaches, farmers markets and local restaurants. The memories and friendships created last summer will stay with me forever. After being a part of the Disney stories last summer, I'm excited to see where my story takes me next! ❖

## GE Aviation provides heavy dose of lean education

By Jennylynn Johnson  
*Virginia Tech, IISE member*

Last summer, I worked for GE Aviation in Greenville, South Carolina, with the plant's Lean Team. I had many projects, but the overall goal was to support the manufacturing of the high-pressure turbine blades for various engines by increasing all of the line's efficiency through 5S, point-of-use tooling, value stream mapping, determining standard work and much more.

This was a large task due to the constant high demand for these parts. I worked closely with my team, specifically the lean manufacturing specialist at the site.

Going into the summer, I had only heard of lean through one of my classes and my previous internship with GE Aviation. I had not completed any work directly within it, aside from updating a value stream map, the elimination of a manufacturing process and automating weekly Excel tasks. I quickly learned that "being lean" involves many steps, changes and support. Furthermore, since the "why" matters most in any field of work, I soon learned the purpose of being lean – to make abnormalities apparent so they are fixed quickly and production can continue.

The first week of my internship consisted of a lot of observing and soaking in information. Since I was in a manufacturing role last summer, I was able to quickly pick up the processes the turbine blades went through, which was help-



Photo courtesy of Jennylynn Johnson

**Virginia Tech IE student Jennylynn Johnson spent her summer internship immersed in lean processes and sustainable manufacturing with GE Aviation in Greenville, South Carolina.**

ful when understanding how the shop flowed. Through discussing kaizen and other lean terms with my team, manufacturers and other resources, I was able to identify areas where the lines and shop had room to improve. Thus, I began initiating projects and starting SMART (specific, measurable, achievable, relevant and time-bound) goals toward proactive action that contributed to the shop's needs and my personal passions.

There were many projects I supported over the summer, but I learned the most within lean from 5S initiatives and action work-outs. I primarily focused on 5S improvements throughout the entirety of the summer to attain the lean management goal score for the shop. I began looking into point-of-use tooling so the manufacturers would have the tools they need when and where they need them. Although this seems small, the lines suffered greatly due to confusion, frustration and, most importantly, two primary TIMWOOD wastes: motion and waiting. During this process, I worked closely with the manufacturers of primarily three lines to work toward a solution.

I discovered that most of the lines in the shop had waste of many kinds, primarily in two manufacturing process locations. Thus, I worked with many manufacturers and the tool room/moonshine leader on the Lean Team and

to standardize different tool holders for these processes. This standardization was only a step toward becoming a lean shop, but also encouraged 5S techniques among all the lines.

During this time of communication, organization and implementation, I supported three action work-outs (AWO) focusing on the new layout of the extension of new manufacturing line; the update of a value stream map (VSM); and standard work attainment for two production lines. Through my support and initiative in various actions, I learned so much from each action-packed week. All of these AWOs had one goal in mind: stay lean to go fast. I learned about how to best optimize floor space for an extension of a manufacturing line from the manufacturers and production control leaders' point of view. I completed a time study and learned how to reduce cycle time and lead time by going in depth for a new VSM.

I combined this knowledge and learned more through engaging with the manufacturers to ideate new standard work procedure options and to correctly level out the amount of work at each operation while trying to reduce the number of manufacturers needed.

Through these projects, I will be able to apply my new learned concepts of lean manufacturing in a workplace facility and as an undergraduate student. Communication is vital for an efficient production flow, and the entire shop must be driven to solve any issue that is faced with a proactive mindset. Furthermore, the terms and processes I learned can be applied in the classroom and various organizations when attacking a large problem at hand or developing a new system. It is necessary to have lean concepts in mind through all actions to aim for the best outcomes but prepare for the worst.

Over the summer, I also started to research environmental efforts the plant could take to create a more sustainable and eco-friendly facility. I primarily sought out recycling partners and new material and facility conservation opportunities. I specifically spent time researching eco-friendly material in which to ship the turbine blades. When parts were shipped from any of the production lines, they were packaged in a Styrofoam and plastic material with specific cutouts to hold each part. Since Styrofoam is very detrimental to the environment due to its extensive decomposition time, I researched an alternative mushroom-packaging material to replace the old holders after they had worn down to an unusable state and as an option to invest for future purchases of part holders.

This was one of my favorite projects because I was able to bring awareness to and connect with many people about eco-friendly alternatives. I gained more knowledge in the lifecycle of the turbine blades, but more importantly, what it takes to properly manufacture them. These projects in

this field allowed me to dabble in a huge passion of mine: sustainable manufacturing.

To tie my internship experience and personal interests together, I planned many events geared toward professional development for myself and the interns. I facilitated a GE Aviation plant tour for 42 GE Power and GE Renewable Energy interns in the area, coordinated six external tours and three internal lunch-and-learns for the GE Aviation interns. Through these tours and connections, we were exposed to lean in an automotive industry, design and assembly in another GE business, and were able to connect with people in different areas of work. Through expanding our knowledge, experiences and connections through these opportunities, we discovered personal interests and different career paths.

GE Aviation provided me another engaging and exciting summer. I was given goals for the summer but allowed the freedom to explore my own interests. My team was always extremely supportive and proactive, which created a welcoming and encouraging atmosphere where I was able to grow as an engineer. This coming summer, I will be back at GE with GE Renewable Energy. I am beyond excited to see where the summer and my passions will lead me in my career and personal goals. ❖

## An out-of-this-world experience at Space Flight Center test lab

By Adriane Tenequer

*Navaho Technical University, Crownpoint, New Mexico*

Last summer, I was given the opportunity to intern with Jacobs Engineering Group at the Marshall Space Flight Center in Huntsville, Alabama. I joined the Jacobs team to get a better understanding of how a material testing lab functioned on a day-to-day basis. With our new metrology building being constructed soon at Navajo Technical University, the understanding of a material testing lab was key.

I remember the sense of pride I felt when I entered the Redstone Arsenal gates. My excitement built as I drove past the George C. Marshall SFC building and the Rocket park, a view that welcomed me every morning. Right off the bat, I was introduced to many of the Jacobs staff members. Everyone was so friendly, like one big family – Southern hospitality at its finest.

“How do we keep everyone safe around the equipment?” was a question we continuously asked, so I had to do complete safety training before I was allowed in the lab. Becoming familiar with the Jacobs Safety Plan of Action was very important. It was a plan I would take home and implement in our facility.



**Intern Adriane Tenequer of Navaho Technical University, left, poses with her mentor, Summer Roden, from the Jacobs Engineering Group's material testing team at Marshall Space Flight Center in Huntsville, Alabama.**

Understanding the setup, tuning and testing also plays a vital role in material and structural testing. During the setup process, we research the ASTM standards, test parameters and size of equipment that would be used. Once our parameters were determined, we input that information into the Bluehill software and selected an external calibrator to be calibrated by the NASA Calibration Labs (NIST certified).

Before testing, we tuned our equipment; the goal is to make sure the command we send out is proportional to the feedback we receive. Once the equipment has been properly tuned, measurements can be taken with confidence. Verify, verify, verify is the most important thing to remember.

After the tuning is complete, we set up our sample for testing. During testing, the data produced can provide a better understanding of the properties of a material and how its performance will respond when a load is applied. This data can influence how systems are designed and how equipment can be operated. Testing not only provides the technician with important information but it also provides the customer with data that can be helpful in designing and structuring the products they produce.

Not only did I work hard, I enjoyed the benefits of work-



**Adriane Tenequer works in the material testing lab at Marshall Space Flight Center.**

Photos courtesy of Adriane Tenequer

ing in the Marshall Space Flight Center. The Jacobs intern coordinator set up multiple tours, presentations and activities for the interns. My most memorable tour was visiting the test site to see the liquid hydrogen tank for the Space Launch System. The size of the tank itself was amazing.

Another great experience was celebrating the 50th anniversary of the Apollo 11 mission and the first moonwalk. The community came together to enjoy music, food and good company. It was an amazing experience to be in a place that helped make Apollo 11 happen.

The summer was a great experience, not only working with Jacobs but also the opportunity to live in Huntsville. I learned new skills working with the material testing team; they made me feel at home and showed me how the material testing lab functioned. Huntsville not only lived up to that Southern hospitality but there were so many beautiful sights to see and places to explore. My overall experience was amazing.

Thank you to everyone who helped make this summer possible: my boss at NTU, Harold Halliday, my mentors Brian Keith Hastings and Summer Roden, and my Material Testing Team in EM-22. ❖