MATC Internship Program

Summer 2018

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This being the last summer of my college career I begun to worry that I would never land an internship and enter the real world with no actual relevant engineering experience at all. Luckily, in February of 2018, I applied and was ultimately hired to be a research assistant at Midwest Roadside Safety. A few months later in May, I was selected to be sponsored by Midwest Roadside Safety to be a part of the MATC internship program. I went from having a barren shell of a resume to a decent one. Not only that, but I got to experience real engineering work first hand, and even contributed. I was not some glorified coffee boy, but an actual part of the research that Midwest Roadside Safety conducts. I worked on numerous different tests throughout the summer, performing different tasks such as SolidWorks drawings, video analysis of crashes, and uncertainty analysis.

The majority of my time this summer I reported to Karla Lechtenberg (Research Engineer) and Justine Kohtz (AutoCad Technician). A typical day or week would consist of asking Justine or Karla what task they want me to work on, and then carrying out the task. The first project I worked on this summer was doing the SolidWorks drawings for an Iowa Bicycle Rail. The initial model and design was done by a graduate assistant. The first task I was to do before starting the drawings was to take an existing model of a splice plate the graduate assistant made and make the components of it separate parts. I remember feeling incredibly nervous as I initially did not understand what was meant by making it into separate parts. In my mind, I thought the splice plate was already one part. This is where I learned that asking questions is the best course of action to take. I was hesitant at first to do this because I was afraid of looking like a fool, and my frail ego tried to get me to delay the possibility of that outcome by not going to ask

clarification. Eventually the fear of looking like an even bigger fool for taking so long on a simple task took over, and I got out of my chair and went to Justine to ask her for clarification. What happened next? She explained it to me and I understood. I went back to my desk and finished what was need to be done and felt an immense relief pour over me. I realized that there is no reason to be afraid to ask questions. Doing the drawings took some time as I had not used SolidWorks for over two years. Through more question asking I eventually finished the initial set of drawings where it was eventually reviewed by other engineers and then given back to me to make any changes. This task really showed me how engineering is really a collaborative effort.

The next task I did was the same as before, except it was doing the SolidWorks drawings for a different test. This one went way more smoothly, since I had gotten over my shyness of asking questions. These experiences with SolidWorks drawings taught me the conventions for dimensioning, which I feel will be a very useful skill to have as I enter the job market next summer.

I then did what is called video analysis. Video analysis uses the TEMA motion analysis software to analyze videos of a crash test to determine important factors such as maximum deflection of posts and rails, impact angle, the vehicle velocity, the exit velocity and the working width of the system. Working with TEMA was great as it allowed me to gain experience with a program I feel like many companies might use. The crash test I did this analysis on was for a special type of barrier called a “Bullnose”. The test for this was unique because while most crash tests have the vehicle impact the barrier on the right or left side of the vehicle, a bullnose test impacts the barrier head on with the front of the vehicle. This made completing this task a bit of a challenge as all

my previous experiences with video analysis dealt with the typical crash tests. Thanks to another healthy round of question asking, however, I was able to complete this task.

The final major task I worked on was doing an uncertainty analysis of how Midwest Roadside Safety does vehicle deformation measurements. To measure the amount of deformation or crush in the vehicle, a coordinate measuring machine called the FAROarm Edge is used to take measurements before and after the test. I, along with a fellow undergraduate research assistant, had to identity the possible sources of uncertainty that may come from measuring this way and then devise a test procedure to evaluate these uncertainty sources. At the time of writing this report, we have created the test procedures and now are waiting for people out at the testing site to perform the tests so we can analyze the data.

I'd like to express my sincere appreciation to Midwest Roadside Safety and the MATC intern program. All in all, this has been a fantastic summer for me. I was initially worried that I'd be completely lost every day and eventually be let go for incompetence. I learned, however, that it's a process and if you don't understand something, that's okay. Ask your supervisors, that's why they are there. I'm really glad to have gone through this internship as I feel it gave me a good amount of relevant experience that I can use when I finally graduate college.