

Reflection on URC RAP program Presentation – Research, Scholarly, & Creative Activity (Application)

I had the opportunity to collaborate with my research mentor under the Undergraduate Research Center, Research Apprenticeship Program, to work on a research project. The project was titled "Development and Evaluation of a PDMS Microfluidic Biosensor with PVDF Sensing Polymer" aimed at advancing biomedical applications. The research anticipated developing a microfluidic device capable of detecting biomolecules and indicating the specific type of molecule tested. Then I had the privilege of showcasing my research on three distinct occasions: firstly, at the Undergraduate Research Center (URC) Symposium 2023, secondly, at the Department of Electrical and Computer Engineering and Technology (ECET) Faculty, and lastly, and most significantly, at the IEEE International Conference On Electro Information Technology (EIT) Conference hosted by Lewis University in Romeoville, Illinois.

I will start from the URC Symposium 2023. I remember it was on Thursday morning April 20, 2023, the event was held at Centennial Student Union Ballroom on campus, I can't deny feeling a touch of nerves, but my habitual early-bird nature had me as the first person on the scene. Although I brought my printed version of my poster, I just received an email stating that I would also have the opportunity to present it on screen. I was one of the lucky three students chosen to experiment with presenting our research on a TV screen connected to our computers. This unexpected opportunity added an extra layer of motivation and flexibility to show extra materials about my research on the tv screen. My research had a bunch of simulation results so getting that opportunity made me very lucky. Being able to show these simulation results and also showing pictures and videos helped for easy understanding of the research.

The presentation took around an hour and a half, towards the end, I met the judges, and I gave them the best presentation I could. Overall, I would say that the presentation went a lot better than I expected. Prior to the presentation, I had even begun to worry that my anxiety could reach a point where I would consider stopping or cutting the presentation short. Later, when I got an email with feedback, I was informed that the presentation was outstanding. Although I was encouraged to speak up more, this feedback was anticipated, as I've long been aware that it has been my persistent weakness and have been working on it. Taking that into consideration, I was getting ready for presenting at the IEEE EIT conference. However, in the meanwhile, one of the professors in our department sent me an email asking if I would be interested in presenting my research given that it was research month. He also mentioned that two of the students, including myself, and a few of the professors had been chosen to present. Initially, I was hesitant to accept the invitation because I wanted to give my full attention to the upcoming conference, but I eventually agreed to give a presentation due to the constant pressure from him and my mentor. Since I was the last presenter in that series of presentations, my trick was to attend the presentation that took place before mine. After observing the other senior student present her research, I learned that I need to keep my cool and remember that my mentor will be there to support me, so even if the faculty members ask me tough questions, I need to take that into consideration. Since this is a more formal presentation than the kind where you stand next to your poster and talk for hours, I had to create a different PowerPoint. I applied the skills I learned from the workshops along with my prior knowledge of creating interactive PowerPoint on canvas.

On Tuesday, April 25, just five days after my previous conference, I entered the presenting room at TRC 310 with a level of unease equal to, if not greater than before. Surprisingly, the presentation went exceptionally well, exceeding the performance of the last one. I was able to take my time presenting and going into further detail about each of my simulation results. The majority of the questions I received from the professors were ones I could respond to, but my mentor was there as well, so she addressed

some of the questions also. Following my presentation, Dr. Wu, our department's dean, expressed his admiration for it and informed me that he had a project for me during the summer. At that point I secured a Research Assistant position at Thin Films Technology, which I have been working on for the past 9 to 10 months.

After feeling satisfied with my presentations and landing a Research Assistant job like icing on the cake my motivation began to wane, and I started considering declining the EIT conference. After a couple of weeks, I eventually decided to email my mentor, expressing my interest in continuing to work on the project. I had completed my midterm exams and felt ready to get back into it after a sufficient break. At that point, she informed me that her schedule had become busy. Due to his expertise in the specific field, we sought assistance from Dr. Bhushan to enhance the research and help me send an improved abstract for official registration in the conference.

Afterwards, I dedicated around two weeks to enhance the abstract and reorganize the research work accordingly. During this time, we demonstrated progress by actively working in the lab and refining our 3D model. Our project was purely experimental, we didn't set out to solve a major problem but rather to prove whether our concept could work. Most of our validation came through simulations, which gave us promising results, even though the actual lab research took longer than expected and we weren't able to fully complete it before the conference. This reminded me that research often happens step by step, and even partial results are valuable when they demonstrate feasibility.

When I was told I had to submit my abstract for review before the IEEE conference, my first thought was honestly, "Ugh, more paperwork." I was already stressed about presenting, and this felt like one more hurdle. But as I sat there double-checking every citation, it hit me that this step actually mattered. What if I had overlooked something or accidentally used someone else's idea? That would have been embarrassing and damaging to my credibility.

The waiting for approval felt endless, I kept refreshing my email nonstop. When the acceptance finally came through, I literally fist-pumped in the library. It wasn't just relief; I felt genuinely proud that my work was original and worthy of being shared. That moment changed how I view research. I used to think citation rules were just bureaucratic details, but now I see that they're about honesty and protecting both your own integrity and the work of others. In the professional world, nobody wants to work with someone who cuts corners or steals credit. This experience really drove home the importance of academic integrity, and I'm grateful for that lesson.

Following this, we left Mankato and drove for six hours to Romeoville, Illinois, a city very close to Chicago. We spent two days in Romeoville, where the presentation took place at Lewis University. Colin, a senior computer engineering student at MNSU currently working at Honeywell, joined me along with Dr. Bhushan, my second mentor. The presentation proceeded smoothly, as usual. At this point, I was feeling very relaxed, and I spoke with more confidence than I had previously.

In addition to the previously mentioned aspects, I talked about the improvements I made in my research. Specifically, I highlighted the progress I achieved in the fabrication of the Piezoresistive biosensor. This included 3D printing mold for the PDMS microfluidic device, a crucial step in the overall process. While integrating the PDMS with the PVDF sensing polymer remained a challenge to be addressed, the judges were impressed with my progress, especially considering the changes I implemented in a short timeframe and the complexity of the research topic for a freshman. They encouraged me to continue my work and return to present my further developments next year.

It was a great learning opportunity to present my research to professors and students from different universities, specifically those that are a part of the IEEE Region 4 universities. Additionally, being honored with the third-best poster award and receiving a \$250 check was truly humbling. The conference offered a fantastic chance to network with fellow students in my major, as well as with

professors and professionals in the field. Meeting Dr. Brook W. Abegaz, an Electrical engineer from the same country as me, was a particular pleasure, and our insightful conversations added immensely to the overall enriching experience.

It was an eye-opening experience that gave me new perspectives on presenting and editing techniques in addition to the opportunity to get insightful advice on how to proceed with my research in terms of focus and direction. Every presentation context has enhanced my ability to communicate complex ideas simply and clearly. This improvement was made by tweaking technical details to suit diverse audiences, with the ultimate goal of ensuring better understanding.

Alongside adjusting the technical depth for each audience, I also had to think carefully about the ethics of what I chose to share and how. For example, at the URC Symposium I could show early simulation results in detail, but at the IEEE conference I had to be clear about what was preliminary and what was still in progress, so as not to misrepresent our findings. I also made sure to credit datasets, mentors, and collaborators properly, since presenting research is as much about honesty as it is about clarity. These experiences taught me that ethical communication isn't separate from research, it's part of the responsibility of sharing it.

I have learned several important soft skills through my presentation experiences overall. These include the significance of maintaining eye contact during presentations to show confidence and enhance engagement. Additionally, I've discovered the importance of projecting my voice audibly to demonstrate confidence and ensure clarity. Dressing well has also emerged as a confidence booster, providing me with an extra layer of comfort and assurance. Most importantly, I've learned to truly value accepting feedback and critiques from peers and judges. Their feedback is a crucial tool for helping me constantly improve.

Now, I feel confident in presenting and engaging in public speaking, especially when I know I've prepared thoroughly for it. I have a plan of applying the skills I learned on my upcoming junior and Senior design projects as they involve coming up with a project idea doing background research and executing the design and presenting it in front of class to the students and the professor, which is pretty much the same as I did while I do my research. I also have a plan to apply the soft skills I learned on my professional career including on my internship this upcoming summer as I will be asked to present my project work in front of my coworkers and product managers.