Department of Mathematical Sciences

Where Are They Now?

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Tell us about your current job. We'd love to hear about the day-to-day work and your broader projects.

"I am currently working as an operations research systems analyst (ORSA for short) in Air and Marine Operations (AMO), which is a law enforcement agency in the Department of Homeland Security. We do a lot of different things here mostly related countering terrorism, drugs and human trafficking; along with assisting other government agencies such as the FBI, Secret Service and Joint Interagency Task Force - South with their operations. In this position I work with all parts of the organization, but my main focus over the last few months has been on our H-60 Blackhawk helicopter program. The first problem that needed to be solved is that, historically, there has been a lack of communication between our operations personnel (pilots, mission planners etc.) and the people who maintain the aircraft. I created a dashboard, using R and PowerBI, that pulls in maintenance information in an easy-to-use display. This is allowing us to plan operations based on scheduled and unscheduled maintenance. We are now also starting to look at what the actual degraders are causing these maintenance issues and how we can plan for it using statistical modeling."

Will you describe your career path. Did you land your current job immediately after graduation or find your way there circuitously?

"Fortunately, I was lucky enough to start working in this career field just a few months after graduating from BSU. I was initially hired as a civilian ORSA intern with the Army at Fort Knox, KY. I ended up working for the Army for five years doing recruiting/marketing analytics. I then spent a few years at the Defense Threat Reduction Agency with my time split between doing data science type work and web development (which ended up being an invaluable skill set to learn.) After a brief stint at the Pentagon doing policy analysis, I started working here at my current job in AMO early last year. This has definitely been an unpredictable path to where I'm at now; not something I would have ever thought would happen if you had asked me 10 years ago."

How have you grown and learned in each of your successive jobs that led to your current position?

"This is an interesting area to work in because every job and project you work on is different. I spend a lot of my time trying to either figure out how to solve a problem or determining what the problem even is in the first place. All along the way through this, I am having to communicate and display everything in a hopefully clear and non-technical way to coworkers and leadership so that they can act on it. I feel like every time that I go through this cycle, I am just a little bit better at what I do (especially the communication piece!)"

What is the most fulfilling part of your current job?

"As I mentioned earlier, we do a lot to combat drugs and human trafficking which is rewarding. In particular, fentanyl has become such a huge problem and we play a large part in disrupting its supply network."

What are the most valuable skills you learned as a Ball State student in the College of Sciences and Humanities? How have they helped you post-graduation?

"Problem solving was a big one. Four years of spending hours a day learning math and physics really gave me a good foundation to build on. I think if you can make it through a year of real analysis and abstract algebra, you can pretty much figure anything out! I also have extremely bad handwriting so at a certain point during my degree I completely switched over to typesetting everything I did in LaTex. This was such a great skill to develop because I still use it almost daily in reports and documentation that I create for projects (in addition to R Markdown, HTML and CSS)."

Is there a particular class, professor, or professional opportunity that had a particularly significant impact on you?

"I took courses in partial differential equations and boundary value problems with Dr. Karls that really clicked with me. Although I eventually became sort of comfortable writing proofs, it was so fascinating to me when we would start with some physical model, such as heat flowing thru a rod, the vibration of a drumhead or even an expanding bubble in a glass of beer and end up with a mathematical framework to describe it. These are the types of things that got me interested in this subject in the first place."

What advice do you have for current or future students in your major or who might hope to follow your career path?

"The main thing I can suggest to someone who wants to go into the data science, ORSA or even web development field out of college is to spend some time figuring out what interests you. Start doing some independent study projects, hopefully with the aid of a professor, to learn that particular skill set. Try exploring different software (R or Python for example) and use them to model and answer a question you are interested in. As an example, suppose you find a website where people rate their favorite beer and you are curious what characteristics are common to the highest rated entries. Is there some correlation between type (stout, lager, ipa), abv (higher vs lower) or even some geospatial aspect such as the region of the world it's brewed. Write a program that scrapes this data from the website and try to answer these questions as best and accurately you can. If you are able to do something like this and clearly explain it to other people who don't have that technical background you should be just fine starting in this career field immediately after graduating (and have a technical project for your resume) There are so many government and private agencies that really need, and are actively looking for, people with this skill set!"