Profile: Matthew Williams

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EARLY INFLUENCES

What sparked your interest in mathematics? When did you know that you would use math as a path to your career?

Math and science were always my favorite subjects in school. In high school, I had the same wonderful math teacher for three years. After preparing for the AP tests, I realized I could pursue math in college and beyond. I didn't really know of any careers in math until midway through college.

If some other field of study led you to mathematics, please tell us about it.

I also studied biology with a focus on ecology. I was very interested in combining math and biology. It looked like statistics was a viable way to do that.

Was there a pivotal moment/experience/ influential person that led you in this direction? Any memorable courses or experiences that made a difference in directing you to your career? Any obstacles you needed to overcome?

I thought I had to choose between biology and mathematics as a major. I chose biology, but I happened to be in the honors program. During my first meeting with the honors program director, he asked me if I still wanted to study math. I said yes, and we filled out the paperwork to add a second major right there. Both departments were very supportive. As for statistics, I had taken one applied statistics course and had later seen some basic statistics in my biology labs. This motivated me to take a second statistics course. Suddenly I had a bunch of new tools. I even had a couple of fellow biology students ask me for help with statistical analyses for their research.

CAREER/CAREER PATH

Describe your current position and briefly, the path you took to get there.

I work within the US Federal Statistical System which surveys individuals and establishments to provide estimates of the population, the economy, agricultural production, health, and many other measures. These estimates are produced as a public good and used to inform policy. After graduate school, I was hired directly into the National Agricultural Statistics Service (USDA). I worked there for about three years and recently transferred to SAMHSA.

What is a typical day at work for you? Please list your job responsibilities. What are you responsible for?

Mathematical statisticians work on designing and analyzing methods to sample the population to balance cost of data collection with stability and reliability of estimates. We use models to deal with missing data values, nonresponse, undercoverage (some people can't be captured). We also use models to combine data from multiple sources and to strengthen estimates of "small areas" like states or counties where the size of the sample is relatively small.

How many hours per day or week do you typically work? Do you have flexibility that allows a good life/work balance?

As a federal worker, 40 hours per week is standard. There's some flexibility if you want to work 8, 9, or 10 days in a two-week period. Work/life balance is typically very good. Teleworking from home a day or more a week is generally encouraged. Traffic in most metropolitan areas in unpleasant, and Washington, DC, is no exception.

CAREER EXPECTATIONS FOR YOUR FIELD/POSITION

How/why are applied mathematics and/or computational science important to your industry? How is it/are they used?

Statistical surveys are measurement systems that require thoughtful design, execution, and evaluation. There is a nice mixture of general methodological challenges and day-to-day problem solving needed to keep things working.

Where do you see the future of math in industry or in your particular career?

In the future, I would like to see more interactive cooperative problem solving between humans and computers (or models). This interactivity can draw out information from an expert analyst to get at implicit priorities or domain knowledge that cannot be communicated through a direct method such as an interview. The challenge is do this in such a way that some kind of uncertainty quantification of the process is possible.

ADVICE

If you could advise someone currently pursuing the same degree or profession, what would you say? What are some steps you would recommend to students, or to those in their early careers, that perhaps you wish you had taken earlier? Are there things you would have done differently?

Networking can be very mysterious and intimidating to some of us. But with time and practice, it does get easier. In broad fields like applied math, statistics, and computational science, connecting to other professionals gives you a sense of belonging and provides examples of different career paths.

Any specific supplementary skills or training you can name that a person pursuing this profession should acquire?

Read as much as you can. When you look for an article or textbook, always take a peek at its neighbors and grab one or two of them also. Try to derive and to code things up for yourself, even if you are going to use a sleeker or more general version from someone else. Find some real data sets and problems. Try working with people in other fields and listen to their challenges. Type up your notes even for little projects and ideas. Writing things up for others forces you to think differently. Give as many technical talks as you can. Try presenting the same material to audiences with different backgrounds.

SALARY

For 2015, can you speculate about the salary range of starting, mid-level and /or senior positions in your specific field?

The American Statistical Association surveys its members regularly and publishes the findings for salaries. US Federal employee pay scales are posted on the Office of Personnel Management website. Starting salary ranges vary widely depending on your degree.

Where can people find out more about your profession?

For more information about the statistics profession, go to the websites for the American Statistical Association (ASA) and the Institute of Mathematical Statistics (IMS). For survey statistics and methodology, look up the American Association for Public Opinion Research (AAPOR), the Joint Program in Survey Methodology (JPSM), and the Washington Statistical Society (WSS). For more information about the US federal statistical system, go to http://www.whitehouse.gov/omb/inforeg_statpolicy and http://fedstats.sites.usa.gov/.