MATH Drives Careers

Profile: Fern Y. Hunt

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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?

My interests in mathematics developed as a result of attending a summer enrichment program at Columbia University's School of Applied Physics and Engineering, and reading "A Concrete Approach to Abstract Algebra" by W. W. Sawyer while in the 9th grade. I didn't see mathematics as a career possibility until later. This interest solidified as I took a basic algebra course with Frida Danenmark.

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?

Growing up the most influential person by far was Charles A. Wilson, my science club advisor and science teacher during my junior high school years. He was an African American with a Masters degree in Chemistry from Columbia University—still a very unusual achievement in the 50's and 60's. Although he was primarily a chemist, his interests and knowledge encompassed biology and physics and his ease and comfort with the use of mathematics looking back now, were a powerful influence on my career choices later on. I am incredibly grateful for the opportunities made available to me through the New York City public school system. My family could never have provided them for me on their own. It took a little time to become completely convinced that I should try to become a research mathematician especially when I found out that this often requires a PhD. As one of the few African American female students at the time, studying mathematics at the undergraduate and graduate level, I had to cross a lot of uncomfortable and unfamiliar terrain at the same time as my professors! There were supportive people and one of them was my thesis advisor, Frank Hoppensteadt. Nevertheless it took a long time to understand things, as my career progressed, that would have been very helpful to me had I had access to better advice and support. Fortunately, there are now more programs, especially for highly motivated minority students and early researchers.

CAREER/CAREER PATH

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

As a mathematician at NIST, my primary responsibility is to conduct mathematical and computational research in areas that support the development of measurement-based science for information technology, material sciences, and biotechnology. I have frequently done this by collaborating directly with other NIST scientists. For example, I have worked with physicists and engineers on a project involving the measurement of the reflectance properties of coated surfaces especially when subjected to the effects of weathering and fading. As an agency in the Department of Commerce the purpose of research done at NIST is to support the needs of U.S. industry.

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

As an employee of the federal government I receive annual and sick leave as well as family friendly sick leave. All of these benefits are extremely helpful in providing a healthy work-life balance.

CAREER EXPECTATIONS FOR YOUR FIELD/POSITION

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

The use of mathematics—both applied and pure(core)—will continue to spread to areas that have not been thought of as quantitative. We already see this happening in biology and biomedical sciences, psychology and economics. Mathematics affects people's lives mainly as the backbone of computer algorithms implemented in the software we use everyday. Machine learning, an area of current intense academic and industrial research, has and will continue to greatly accelerate the automation process. This will affect how we do our jobs and what jobs are available in the future. We are in the midst of very large scale environmental change. Applications of mathematics that can help meet the challenges posed by this change is sorely needed.

Have you worked other jobs, or held other job titles as an applied mathematician or computational scientist?

Yes, I worked for many years in academia, teaching at several universities at the undergraduate and graduate level. I enjoyed this work very much.

ADVICE

If you could advise someone currently pursuing the same degree or profession, what would you say?

My advice is directed to someone like myself. First I would say, if you are a very shy person who wants to do research remember that it is a group/community activity even if you are working by yourself. This means that many times you will have to step far out of your comfort zone if you are to progress. Fortunately there are many people in the profession who want to help you out. But you will have to reach out to them somehow. Take advantage of every program and opportunity to do so. Secondly, research can be quite stressful at times. Develop a relaxing hobby. Music, meditation, hiking or relating to friends and loved ones are great for helping one gain perspective and inspiration.

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

I would become fluent in a foreign language.

SALARY

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

The starting salary for a new PhD is about $66,000.

Where can people find out more about your profession?

Math.nist.gov has more information about mathematical and computational science research at NIST.

SAMPLE APPLICATION

Rather like the procedures used by the railroad signals and switches that regulate and control train traffic, computer protocols are the procedures that govern the flow and direction of data on the internet, with the goal of achieving efficiency and speed of transmission. While analyzing a mathematical model of a computer protocol for congestion control, the author used Viviani's theorem to visualize the random assignment of data to more than one path.

See details.