MATH Drives Careers

Profile: Jonathan Adler

Advanced Analytics Consultant
Promontory Growth and Innovation, Washington, DC

BS, Mathematical Sciences, Worcester Polytechnic Institute; MS, Applied Mathematics, Worcester Polytechnic Institute; PhD, Industrial Engineering, Arizona State University

EARLY INFLUENCES

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

I have been interested in mathematics since I was a young kid. I think it started when I watched the show "Square One" as a child, which was all about mathematics. Math was definitely my favorite subject all the way through high school. In college I started off as an electrical and computer engineering major, but I quickly decided that wasn't for me.

My favorite part about mathematics was finding ways it can be used in my life. This made me less interested in theoretical mathematics and much more interested in applied math. I love doing the work of trying to understand a situation to see what math can be used. I also have found businesses interesting, since we interact with them every day and pretty much all of us work for one, so using mathematics in a business setting was an obvious choice for a career path.

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

I have always been mostly interested in mathematics, but computer science has interested me too. I enjoy thinking about algorithms and the theory behind computer science, which mostly ends up being mathematics anyway.

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 have a few! My freshman year I took a course in graph theory. This was the first math course I took that really caused me to see the creativity in mathematics. In my graph theory course, I got to see how the structure of vertices and edges can lead to interesting results. As I realized these vertices and edges could be used to represent real world ideas like social networks or sets of roads and intersections, things really started to get neat. I loved having the problem solving in the class bring results like better ways to traverse a set of roads or how to find the most important people in a group of friends.

As a senior at Worcester Polytechnic Institute I had to do a Major Qualifying Project before I could graduate. I did my project with Dr. Suzanne Weekes where I did work for Bose in modeling how heat is generated by a screw being inserted into plastic. This was one of my first instances of really having to tackle an important real-world problem. I had full creativity to decide how to model the screw and what mathematics to use. This made me understand that mathematics was more than just getting the right answer; in fact, usually the most important thing is how you set up the problem in the first place.

During my Master's I did an internship at Boeing Commercial Airplanes. There I was in the marketing department helping them forecast the growth of the commercial aircraft market over the next twenty years. I helped them by using mathematics to more accurately forecast the growth trends. During that internship I first realized just how powerful mathematics could be when trying to run a business.

CAREER/CAREER PATH

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

I am an advanced analytics consultant, which means I help businesses run more efficiently by analyzing their data using statistical models and optimization techniques. This can mean things like better targeting advertising by determining which customers are most likely to buy a product, or optimizing the price of a company's products. With today's focus in industry on collecting and keeping data, it's really important that there are experts who can take that data and provide meaningful insights from it. As a consultant, I go into companies and find new areas for using mathematics and statistics then use that to increase the company's profits.

I started in industry doing analytics for companies, where I would be the person who understood company data and would report on it. I spent a lot of time in my different roles trying to find new areas within the business where mathematics could be useful. Eventually that lead to me switching careers to be a full time consultant; since I was spending so much of my time finding new areas of improvement anyway, consulting was more of a natural fit.

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

Currently I work from home, so most of my day is spent in front of my computer (although I will periodically fly out to a client site to meet with people or to better understand a process). I spend my day managing client data and analyzing it in R or MATLAB. I will try and understand what relationships there are between the different data points and building models to try and predict how the data will behave in the future. I spend a lot of time on the phone with my coworkers discussing the data and how to approach it.

What do you like best and least about your profession? What is the stress level associated with this type of position?
As a consultant it's really neat being able to work with so many different companies on so many different types of problems. One week I may be using linear programming to try and optimize overtime, and the next week I could be using clustering methods to try and segment a customer base. In this job I am never bored and I am constantly learning new things.

It's hard for me to name something I like least about my job—being an analytics consultant really feels like the perfect job for me. I suppose the downside of having so many different projects is that sometimes you have to give up on finding a really elegant solution to a problem and instead go with something simpler. The fun elegant solution to a problem you're working on as a consultant is oftentimes too complicated and not robust enough to apply in the business world.

How many hours per day or week do you typically work? Do you have flexibility that allows a good life/work balance?
As a consultant, the number of hours per week you work really depends on the client engagement. You may have weeks where almost nothing is happening, followed by weeks where you have to scramble and work many more hours than normal. Also, depending on the particular consulting role you may have to be travelling as many as four days a week. Thankfully, in my current role I have little travel and I get to work from home, which adds a lot of flexibility to my schedule.

CAREER EXPECTATIONS FOR YOUR FIELD/POSITION

How/why are applied mathematics and/or computational science important to your industry? How are they used?
Applied mathematics is extremely useful to consulting, because so many problems in business these days need advanced solutions. Now with data becoming more readily available, you need complex mathematical models to be able to gain valuable insights out of it. And as more companies are using analytics, the ones that fail to do so are being left in the dust.

Where do you see the future of math in industry or in your particular career?
It's hard to imagine that analytics will ever go away; now that businesses have started to use applied mathematics to run more efficiently, they won't be able to stop.

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?
To be able to succeed at using mathematics for business purposes, you need to:

1. *Have a basic understanding of how databases work and how data is stored. Without that you won't ever be able to get the data to do math with in the first place.*
2. *Have a basic understanding of programming. Since these days everything is done on computers, you'll need to use them to analyze the business data.*
3. *Have a basic understanding of statistics. Since everything is based on data, you'll need to be able to understand how the uncertainty of the data will affect your results.*
4. *Be able to solve new problems and learn new approaches (this is by far the most important too). As you work with companies you will constantly be running into situations you have never encountered before. Being able to figure out what is going on, do some research, and devise a solution is the key to succeeding. And this is where a degree in mathematics is especially helpful, since college-level mathematics is all about encountering new problems then doing research and devising solutions for them.*

Any specific supplementary skills or training you can name that a person pursuing this profession should acquire?
See above; the three big things are databases, statistics, and programming.

SALARY

For 2015, can you speculate about the salary range of starting, mid-level and/or senior positions in your specific field?
It really depends on the particular company and role, but for doing analytics a starting salary is around 50k, a mid level salary is around 90k, and a senior role is probably around 120k. If you do analytics as a consultant for other companies you can multiply those numbers by 1.25 or so.

Where can people find out more about your profession?
Honestly, the field is so new that I can't recommend anything beyond the wiki page on analytics (http://en.wikipedia.org/wiki/Analytics) and talking to people in the field.

INTERESTING NOTE

In March, Jonathan won the American reality TV series competition "King of the Nerds," which features nerds and geeks competing in various challenges for a cash prize of $100,000 and the title of "King of the Nerds." See more.