



Career Options for Mathematicians

And how to get a job outside academia



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Brian Quantz Streit

- Started industry career in April '14
- Baylor University Math PhD Dec '15
- 1 peer reviewed [math publication](#)
- Applied to > 1k industry jobs, Interviewed for > 100 jobs
- Hired FT to 9 jobs, multiple contracts
- Reviewed > 1k resumes, Interviewed > 100 people for jobs
- Hired > 20 people, terminated employment of 2
- Multiple [patents](#)
- Head of A.I. at ON24
- Cofounder and CTO of Syntegral
- 10 years' experience **monetizing emerging technologies**



Heatshot circa 2013ish
Courtesy of BU Career Fair



Disclaimer

I will employ an uncommon amount of transparency with respect to historical compensation; however, I will not disclose any monetary information regarding current business dealings.



Career Options Compared



Academia

- Job availability limited by geography
- Fair compensation for tenure-track
- Low raises outside of duty change
- Much better work-life balance
- Difficult to switch specializations
- Incredible job security, post tenure
- Must search for research problems
- Limited to few new and vacated positions
- Standard interview process
- 1 or 2 employers in career



Industry

- More flexible location options
- Much higher starting pay
- More opportunities for pay increase
- Hours can easily get out of control
- Option to move around different sectors
- Reasonable chance of F.I.R.E. within 20 years
- Problems fall into your lap constantly
- Many more job opportunities
- High variability in interview processes
- New employer every 2 years, on average, in tech



Hybrid Career Options

- Work FT in academia and consult in industry on the side
- Work FT in industry and teach/research on the side
- Work in a research lab with academic ties
- OCS (officer candidate school) is an option, if you can pass basic training
- Retire from industry into academia
- Nearly impossible to retire from academia into industry



Andriy Burkov • Following



ML at TalentNeuron, author of The Hundred-Page M...

14m • Edited •

In a typical organization, the management thinks that a single ML specialist is a superhero magician who can convert their business into a Google competitor. Especially if that poor guy has a PhD, no matter the discipline.



My Journey



Retail Banking

- Citizens State Bank - Waco, TX; Apr '14 - Jan '15
- Data Analyst and Research Specialist
- \$60k base, roughly the going rate for postdocs at the time
- Found thru Baylor job listings, boss was alum
- Reported directly to the owner of the bank
- Used (and abused, 5+ min spreadsheet load time) Excel
- Laid off due to cost-cutting measures



Commercial Mortgage Banking

- RED Capital Group (a wholly owned subsidiary of ORIX) - Dallas, TX; Apr '15 - Dec '15
- Business Systems Analyst
- \$80k base, slightly less than tenure-track salary
- Was referred to the job by a friend
- Reported to the COO, math major with a JD who got into mortgages
- Became an Excel ninja, used VBA to automate processes, started learning SQL
- Finished PhD while working full-time
- Continuing Ed - CFA
- Resigned after finding a better job



Data, Software, and Hardware

- DRN (a wholly owned subsidiary of VaaS) - Ft Worth, TX / Remote / Carrollton, TX; Apr '15 - Dec '15
- Found on LinkedIn
- Senior Business Data Analyst -> Data Scientist -> Manager
- \$105k base (\$5k more than I asked for), bonuses, raise in base roughly 2x inflation, equity **option** grants
- Massive amounts of highly sensitive, yet most unregulated, data
- Reported to Cofounder and CTO, became a lifelong friend
- Rapidly progresses to senior-level skills in: R, Python, SQL, data science/machine learning
- Work trip of a lifetime: 2 weeks in Vietnam
- Resigned after finding a better job
- VaaS sold to Motorola Solutions in Jan of '19 for \$445M



Independent Work

- Started after massive leap in skills post-DRN, continues to this day
- Government subcontracts
 - Classify moving objects based on GIS data
 - On-drone image classification (bird vs not bird)
- Solved special cases of FHE, multiple patents
- Beat the NYSE
- One day will get around to beating daily fantasy football



Healthcare Claims Auditing

- HMS (publicly traded on NYSE at the time) - Irving, TX / Remote; Nov '17 - May '19
- Headhunted and/or found on LinkedIn
- Data Scientist -> Director of Data Science and Analytics
- \$150k base (\$5k more than I asked for), bonuses, raise in base roughly 2x inflation, stock grants
- Massive amounts of highly sensitive (HIPAA) data
- Reported to Sr Director of Payment Integrity, became a lifelong friend
- The most revenue I've been responsible for, \$10M+
- The most people I've managed directly (no middle management) at one time, 10+
- Negotiated severance, **after** finding a better job
- Went public -> private: Sold to Gainwell for \$3.4B cash in Apr '21



Home Warranties (Insurance)

- FTDR - publicly traded holding company for largest home warranty company in the US, American Home Shield
- Denver, CO / Remote (due to COVID); May '19 - Jul '20
- Headhunted and/or found on LinkedIn
- Sr Manager of Data Science
- \$220k base, \$60k sign-on/relo bonus, annual stock bonus
- Reported directly to the CTO
- Roughly \$1.4B revenue at time of hire
- Dispute with leadership led to my being forced into accepting a severance package
- Soon after stock tanked and almost all execs were fired or left



Sports Betting

- PointsBet - Denver, CO / Remote; Jul '20 - Jan '21
- Found on LinkedIn
- Machine Learning Team Lead
- \$150k base
- CTO was skip-level boss, reported to VP of Engineering
- Resigned after finding a better job (COVID job market downturned settled)



MarTech/Webinars

- ON24 (publicly traded on the NYSE since IPO in Feb '21) - Remote; Jan '21 - Present
- Headhunted and/or found on LinkedIn
- Head of A.I.
- CPO/CTO is skip-level boss, report to VP of Engineering
- Reporting to me currently: one ML Team Lead, one Sr DS, and one DS intern
- Hope to be a lifelong friend/mentor to my employees
- Ran 3 summers of internships
- Hoping to hire more next year



Startup

- Syntegral - Remote; Jan '23 - Present
- Found on LinkedIn
- Cofounder and CTO
- Sustainability asset intelligence platform
- Self-funded/bootstrapped but planning to raise Seed Round soon



The How

- Fully commit - your new FTJ is getting a FTJ
- Build a resume, unlike a CV, a resume should be a **one-page** advertisement of yourself to get the HM on the phone
- Create a LinkedIn profile - almost all my jobs came from LinkedIn
- Find a mentor - friends/family, alumni network, reach out to strangers on LinkedIn
- Network - it's not who you are but who you know, and who you can become
- Start applying - cast as wide a net as possible
- Reflect on outcomes, improve your performance, and repeat

Brian Streit
b Streit@gmail.com

Education

- **Baylor University**
 - PhD Mathematical Physics
 - 4.0/4.0 GPA
 - December 2015 Graduation
- **University of Texas at Dallas**
 - MS Applied Mathematics
 - 3.94/4.00 GPA
 - Graduated May 2010

Relevant Skills

- Advanced Excel user, experience with VBA, SQL, Access, Strategy, MS Reporting Services, JMP, Crystal Reports, Mathematica, MATLAB, Java, and C++
- Strong work ethic, keen attention to detail, tremendous analytic and interpersonal skills
- Great communication and the ability to clearly articulate difficult concepts

Experience

- **Red Capital Group** **April 2015 – Present**
Business Systems Analyst
 - Interface with loan servicing, asset management and IT to solve complex business problems
 - Automated or streamlined several processes including:
 - End of month servicing portfolio analysis and mortgage servicing rights for accounting
 - Bulk correspondence creation, payoff request processing, rate cap analysis, and springing rate cap purchase notification emails for asset management
 - Create ad hoc reports and data visualization for portfolio management and operations director
- **Baylor University** **January 2015 – April 2015**
Instructor and Researcher **August 2010 – May 2014**
 - Taught two sections of Introduction to Statistics, four sections of Precalculus, and two sections of Business Calculus
 - Winner of the Baylor University Three-Minute Thesis Competition, which challenges presenters to communicate their research to a non-specialist audience within three minutes
- **Citizens State Bank** **April 2014 – January 2015**
Data Analyst and Research Specialist
 - Analyzed large data sets, Crystal Reports was used to query and Excel to manipulate
 - Coordinated with multiple departments including accounting, compliance, marketing, and sales
 - Spearheaded interdepartmental campaigns such as an effort from marketing and sales to retain certain borrowers whose notes were up for repricing or in danger of payoff
- **University of Texas at Dallas** **August 2008 – August 2010**
Instructor and Researcher
 - Leveraged knowledge of computer science, in particular graph theory and algorithms, to research wireless mesh networks for two semesters
 - Winner of the Outstanding Teaching Award from the School of Natural Sciences and Mathematics in the University of Texas at Dallas, given once a year to one instructor



Lessons Learned

- Good mentorship is the best unfair advantage in your career - choose your bosses wisely
- Accept the fact that luck plays an important role in every successful career
- Money only brings happiness up to the point of financial stability, maybe \$80k/yr for an individual currently
- Humans are capable of incredible things with the proper training (Wim Hof), most of us barely scratch the surface
- Learn your body and listen to it, all things in moderation
- Don't underestimate the healing/wellness powers of yoga/stretching and meditation
- You will consistently overestimate what you can accomplish in 1 year and underestimate what you can accomplish in 10
- Treat people with dignity and kindness - everyone is on their own journey in life
- Never stop learning
- Time is your most valuable resource



Suggested Reading

- How To Win Friends And Influence People, by Dale Carnegie
- What Every BODY Is Saying: An Ex-FBI Agent's Guide to Speed-Reading People, by Paul Costanzo, Joe Navarro, et al.
- Legacy: What The All Blacks Can Teach Us About The Business Of Life, by James Kerr
- Rich Dad Poor Dad: What the Rich Teach Their Kids About Money That the Poor and Middle Class Do Not!, by Robert T. Kiyosaki
- More Money Than God: Hedge Funds and the Making of a New Elite, by Sebastian Mallaby
- When Genius Failed: The Rise and Fall of Long-Term Capital Management, by Roger Lowenstein
- Multipliers, Revised and Updated: How the Best Leaders Make Everyone Smarter, by Liz Wiseman
- The Subtle Art of Not Giving a F*ck: A Counterintuitive Approach to Living, by Mark Manson
- Extreme Ownership: How U.S. Navy SEALs Lead and Win, by Jocko Willink and Leif Babin
- The Fabric of Reality: The Science of Parallel Universes - and Its Implications, by David Deutsch



Thank you

