For the Love of Math

# A Narcissistic View of *my* interest in math

Ever since my high school days I have had a certain zeal with regards to Physics. I was good at Math in my schooling days but Physics was where my passions lied at. Then came university where I took the closest thing engineering has to offer to Physics in circuit branches – Electronics and Electrical Engineering. I do not know what exactly is the reason for this, but my interest in physics and electrical in my school days never made it to my time at the university. Now most people, including me till last year, blamed the IIT teaching system: *“The professors at IITs instead of making the subject interesting make you hate even the subjects that you loved till high school.”* I believe this is more than a bit unfair to the calibre of our professors. What I personally found and believe in is that it is not the professor but the student’s perspective towards the subject that leads to the deterioration of her grades. I found myself guilty of the fact that I simply did not pay much attention to the subjects in my first semester.

The second semester of my university life was a total 180 shift of what my first semester was. I started focusing on the theoretical details that my courses had, started scoring more marks and most importantly, started exploring my interests *outside* circuit engineering. By sheer luck or by the buzz around the topic, I found Artificial Intelligence as a domain of knowledge that I want to conquer. So I started by taking courses in it, doing projects, internships and even co-founded the AI society of my university. This was my 2nd to 4th semester – learn and apply AI. Oh and one more major development that I had in my 3rd semester was that I applied for and got the math minor degree offered in my college. Everything was going pretty well – I was about to go to Sydney for my third internship, my grades were going up, and our AI society was flourishing as well.

Then came the March of 2018. I had a course on Stats in my minor and the course instructor was just changed for post mid-sem part of the syllabus. This was one of the most defining moments in my math journey – I started genuinely taking interest in Statistics and Probability Theory, all thanks to my professor Dr. Ayon Ganguly. Luckily enough, when I went to Sydney in May, my projects were also very math intensive and required me to study heaps of material before the actual “*application”* part came to be. I have a small anecdote from my journey to Sydney – I made a friend at the Singapore Airport where I had a layover of a couple of hours. She was Indian too and thus she knew and followed the famous stereotype – all IITians are nerds, and to be fair I am a huge nerd so she was kind of right in assuming so. We had a ton of fun at the airport because there was so much to explore and I for one am the kind of person who doesn’t bother getting all tired up exploring new places just like a puppy with a new toy. So we boarded the plane and she came to meet me after our plane was stable in the air. She loudly said, standing in front of my seat with like 10 people around her, and I quote “*Dude don’t you have anything else to do than doing these stupid equations?”.* Yes, I was solving a problem from a math book that I was studying for my intern in an 8 hour midnight flight. That’s how much I loved the math part of AI.

Sydney was a blast. I did that *“puppy-with-a-new-toy”* thing for the whole two and a half months and spent all of my stipend travelling Sydney. *My supervisor’s supervisor –* Dr*.* Sally Cripps – was in Rohit Sir’s, my supervisor, own words “*a math genius”.* Well, you don’t get to be the director of a whole Centre for Research at USyd without being a genius. Anyways, she was another major source of inspiration for me to study math. I remember once when she took the whole Centre to a bar to welcome a newcomer to the Centre and I had one of our meetings, *in actuality: lectures on beautiful math,* scheduled with her during the same time. When she came to *the cave,* a huge room with kickass PCs where 4-5 of us low life “AI developers” worked, to invite me to the party, she said “Konark, I remember our meeting but this party has come up and you are coming with us. And grab your notebook we’ll chat over a beer there.” She literally was willing to give a math lecture to me in a damn bar in the middle of a party! Anyways I was the sane one when we actually got to the bar and I didn’t mention the lecture, and we chatted over Genghis Khan’s love for his wives, Jainism and Jain’s eating habits along with a long discussion on yoghurt. These lectures were the last bit that delved me deep into the amazing field of math!

My 5th Semester’s first half was a literal hell for me as I was under a lot of pressure to get an internship for my 2019 summer and after a few weeks of almost killing myself with competitive coding, which no offense is *the worst* part of Computer Science Engineering, I got an intern as a quant researcher at JP Morgan & Chase, Mumbai. Now many of my juniors asked me “Weren’t you an AI guy? Why are you going to finance?”. Only my close friends know this and I want to take this opportunity to tell the world – **I am not an AI guy, I am a math guy.** And I am promised math intensive coding in quant research plus I need the money for supporting my family. When I got this part of my life sorted out, I finally began with learning something that I would actually value. My projects in Sydney were in simple terms learning models for complex data that is data that can not be modelled with current techniques without using extremely computationally expensive models. I thought it’d be cool to try out my research in areas of AI which have these kinds of extremely complex data. So I started learning Natural Language Processing and a book on Probabilistic Models for ML by David Barber. NLP was fun but not something that I found very interesting. I never managed to actually finish Barber but it is on my to-do list, yeah.

The came the winter break of 2018 – from then to today, I am in a state of so much flux that I do not know what I want to pursue next. Some topics that interest me and which I am trying to pursue in parallel are: Reinforcement Learning, Generative Models, Math – (group theory in minor and learning theory for self study), Quantum Computing and Blockchain. Yes, I am an idiot and yes you are thinking right, I will most definitely screw up while learning each of these areas. But I simply can not help it. I am too interested in everything that I mentioned to drop any one of them. If you can help me with how to sort this out, maybe drop me a comment or email me. I would really appreciate any help because the point where I become overwhelmed and give up all of these subjects together is not very far.

Anyways so this was the story of my interests in math till today. I don’t believe it that you liked it but I just have been meaning to write *something* for so long that I just went up and blabbered this 1300 something words on an off day. Thank you for reading. This is a part of a series which I want to call “For the love of Math” but I can’t assure if or when the next part is coming. I want to write about various extremely cool things that I discovered in Mathematics as a whole in my short journey of about 4 years studying “*applied math”*.

Side note to my friends – I know I am going to be made fun of by you guys when you read this and I just want to this – bring it on!