Roadway to Success

Building your path in CS

By:

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9th July, 2021

About me (2017)

First engineering aspirant in the family. First generation undergrad. No mentor or guide to help.

1 year into my engineering, cannot execute a simple C++ code yet. Only takes part in non-technical events.

Ranked outside of Top 350 in my batch, in the bottom 40 percentile. Cleared a programming subject by just 2 marks.

Learnt English as a 4^{th} language and has a huge stage fear.

About Me (2021)

B.E. (Comp) from PICT with a GPA of 9.21/10. Incoming MS CSE (AI) at UC San Diego from Fall 21.

Data scientist at vCreaTek Consulting LLC. Working with brands like Johnson & Johnson for setting up their ML solutions.

Research intern at IIT Bombay, ISRO (IIST), Patagonia Health USA.

GRE score of 332/340. Author of 7 research papers.

Presented work at IIT Bombay, BITS, Manipal University.

My UG Career Timeline

Aug 2016 - June 2017: Nothing

June 2017 – Feb 2018: Web dev (JS+Python)

Dec 2017 – Feb 2018: Machine learning CW

Feb – May 2017: Web Intern at Mayadata

May – July 2018: Web+ML Intern at IIT B

July – Sept 2018: Deep learning CW

Sept 2018 – Mar 2019: ML Intern at Patagonia

Jan – Mar 2019: GRE preparation

Mar – May 2019: ML Research work (Paper 1 + Paper 2)

May – July 2019: ML Intern at ISRO

July – Aug 2019: ML Paper 3 + 4

Sept – Dec 2019: Deciding univs, SOPs, LORs, conferences

Dec 2019 – Jan 2020: MS Applications

Jan – Jun 2020: Nothing

What went right for me?

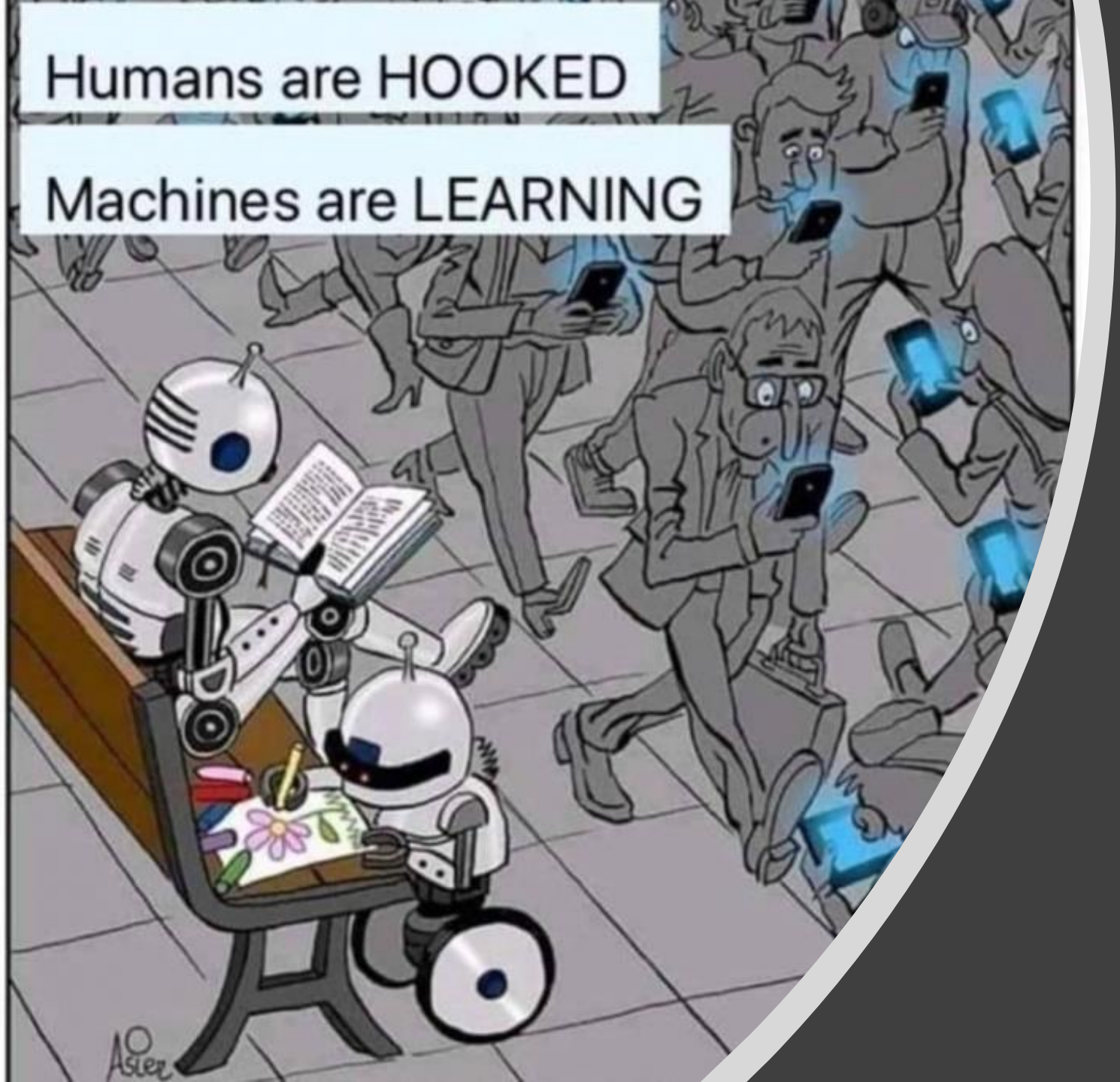
- ✓ Exploring all domains, but then exploiting one to the maximum
- ✓ Keeping a sharp eye on opportunities, and not hesitating from shooting for the fences.
- ✓ Being a part of communities, and networking actively.
- ✓ Being consistent and planning short term goals that align with the long-term goals.
- ✓ Taking calculated risks, having backups, developing patience.

What could I have done better?

- ✓ Starting early: Never a bad time to explore what's happening around
- ✓ Data structures: Being good at it from the start
- ✓ International initiatives: Being aware about international internships or summer programs
- ✓ Startups: Being aware about them, how things work
- ✓ Networking: Improving it further, constructive social media use

Things to discuss

- The Path: Choosing your domain
- The Builders: Projects, Internships, Research papers
- The Stage: Networking, LinkedIn, GitHub
- The Future: Placements v/s MS v/s MTech v/s MBA v/s Others
- The Audience: Q and A



1. THE PATH

1. Choosing your domain

- Explore all options out there: Read blogs, Implement mini projects, attend talks. Do not hurry: ‘Make’ this decision patiently.
- Ask these 5 questions:

What is the current market value? What is the future market value? Am I good at its basics and like it? What are the opportunities in my environment? How does it fit in my short-term and long-term goals?

The T Person: Breadth Depth over 2 domains

- Jack of all + Master of one >>

Master of one >> Jack of all

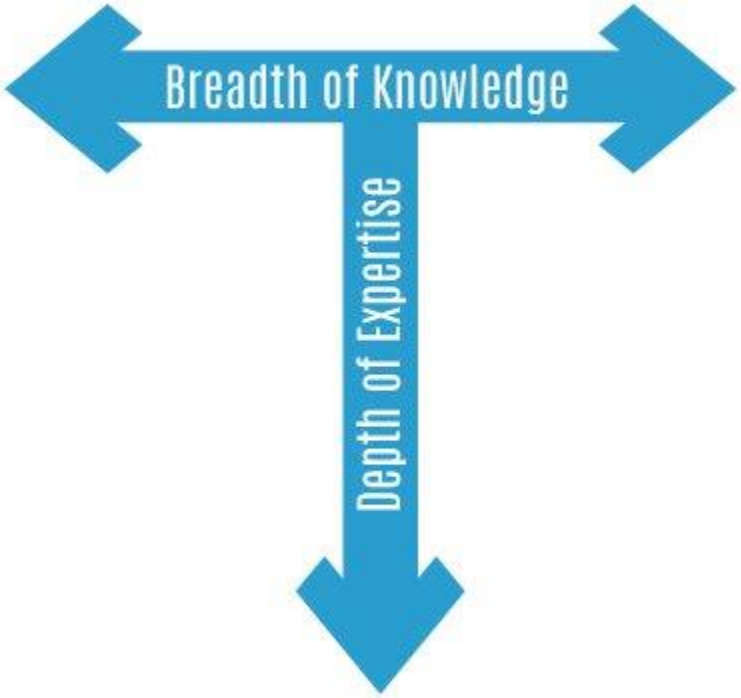
- Domain 1 (Depth):

  Intermediate/Advanced Proficiency

  through projects, intern, hackathons

- Domain 2 (Breadth): Basic proficiency,

  strong fundamentals, sound reading



How to differentiate Domain 1 v/s Domain 2

- Can differentiate using these questions – Industry vs Research, Present vs Future, Local vs Global, Money vs Fun
- First excel at Domain 1, then start with Domain 2 while using proficiency in Domain 1 to get new opportunities
- Keep up with your college CS subjects to maintain breadth
- Placements in India: Competitive coding could be one of the two domains

Available domains*

- Local / Present / Industry: Web dev, Competitive Coding, Application dev, Mobile dev, DevOps, Business Analytics, Data engineering
- Future / Research / Global: ML, Blockchain, Quantum, Cyber-sec, AR, VR apart from the ones mentioned above

*: From a perspective of a fresher, in a non-Tier-1 college going through the general placement route in 2021. Things may differ for Tier-1, or for people who work in startups, have contacts, or get a lucky break ☺ Note that these aren't the only domains

2. The Building Blocks

2. Projects, Internships, Research Papers

- A project can add / remove value from your profile depending on your claimed proficiency levels and the stage where you present it.
- Characteristics of a good project:
  - Covers the fundamental concepts
  - Uniqueness and Novelty
  - Goes in-depth, preferably an end-to-end use case
- Project != All projects you have worked on during learning. Project = A work you would want to show on your profile, expecting it to bring you acknowledgment or rewards.

Projects: Pointers to remember

- Gradually increase the depth, starting from PoCs to modules to end-to-end use cases.
- Only claim what you can explain. DO NOT hesitate to give credit if it is a team project.
- Credit any used open-source code. Open source your own code. Sites like GitHub, Kaggle are a good way to publish your work.

Research papers

- Research: A novel contribution to the community. Could be retrospection, or a new method that provides improvement in performance.
- Once you have done ample work in a particular area, you will start picking up minute details and ask questions. Different questions can give rise to different type of papers.
- Having strong fundamentals, ample projects, and patience is a must!
- Research papers rarely help freshers in getting job. However, they are of TREMENDOUS help to bridge your profile gaps when applying for MS abroad.

Research papers: Types

- Why was it so difficult for me to find information on previous work in this area? - You can write a survey paper!
- Here's task T1 that is solved by method Y. Here is Task T2 that has scope for improvement. What if I use Y to solve T2? – You can write an application paper!
- What if I can improve performance on a task by proposing a new architecture / method of my own? – You can write a core research paper.

Freshers are not expected to have Type 3 papers. But Type 1 and Type 2 papers are a good way of building a profile for MS/PhD/R&D profiles.

Research papers: Pointers to Remember

- Quality over Quantity. 1 high quality paper >> 4 low quality papers
- Conferences publish faster. Journal publication takes time but can carry more value than a substandard conference.
- Mentorship can be a game changer. Research work done under a good guide will transform your thinking experience and will help you forever.
- Academia internships are a good way of getting to work on a research problem.

Internships

- Helpful to get real-world experience. An actual use case, which helps you understand the bigger picture. Often adds a good project in your profile.
- Internships do not necessarily help for jobs. But they almost always help for higher education, especially as a fresher.

CORPORATE INTERNSHIP	ACADEMIA INTERNSHIP
- Work on a business problem and get industry exposure - Unpredictable work - Pays well - Can convert to a PPO.	- Often work on a research problem. - Known task. - Less about pay and more about guidance - Can help for your higher studies.

Internships: How to get one?

- Official programs: Summer internship programs, On-campus internship drives, Hackathons. Keep searching online.
- Reaching out to recruiters: LinkedIn, Twitter, Communities
- Cold mailing: A low success rate but one worth the effort. Works especially for professors, college alumnus, and higher ups. DO NOT mail randomly
- IF YOU PAY FOR IT, IT IS NOT AN INTERNSHIP. If you do a task that could be done very easily without the internship, you will only benefit off the brand.
- Special Mentions: GSoC, MITACS, IITs, IISc, NTU India Connect


my linkedin profile
R, python, javascript, shiny, dplyr, purrr, ditto,
ggplot, d3, canvas, spark, sawk, pyspark, sparklyR,
lodash, lazy, bootstrap, jupyter, vulpix, git,
flask, numpy, pandas, feebas, scikit, pgm, bayes,
h2o.ai, sparkling-water, tensorflow, keras, onyx,
ekans, hadoop, scala, unity, metapod, gc, c#/c++,
krebase, neo4j, hadoop.
I typically ask recruiters to point out which of these are pokemon.

3. The Stage

3. Building in Public

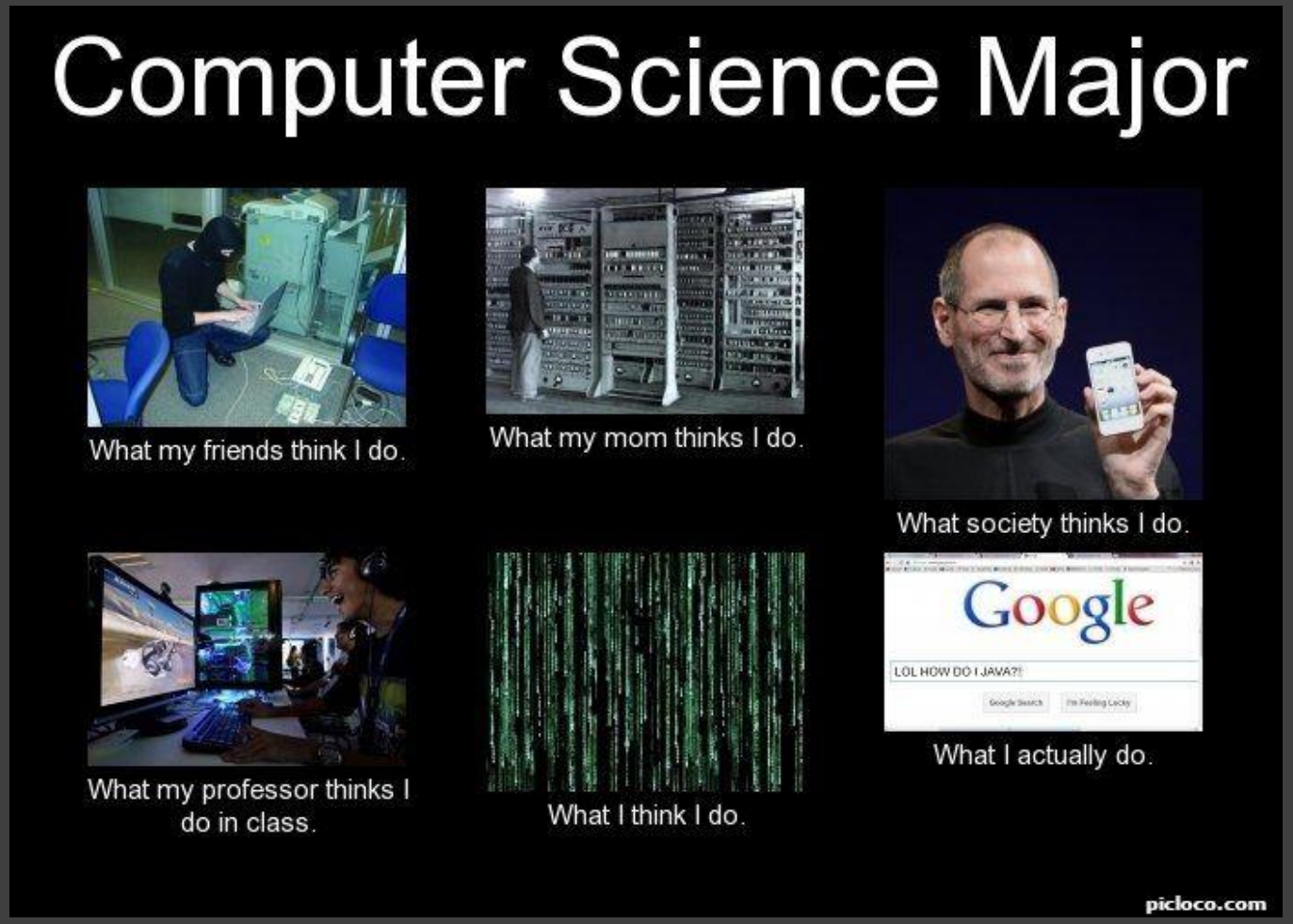
- Maintain a strong, up-to-date LinkedIn profile. Post relevant content, make good connections, don’t hesitate to reach out.
- Maintain a GitHub profile. Post documented projects. These will speak for you. Can significantly up your resume value.
- Join communities, meetups, talks. Reach out professionally on other mediums as well (Twitter, Clubhouse)
- Community mentions: Maxpool, A Junior VC, The Product Folks

Special Mention: PASC

- PICT ACM Student Chapter was the first community I joined
- Platform to make mistakes, learn, and grow
- Managing an entire event, conducting seminars, developing projects that were put to real use
- Working with more than 200 students. Representing the chapter at the ACM India National Summit
- Excellent mentors, colleagues, and juniors along the way! <3

Networking: Pointers to know

- For the world, you are only as good as people think you are.
- No one will do favors until they get to know you. Show them your value, bring something to the table. Partnerships will build.
- Don’t be a mere spectator. Play the game. You lose some, you win some. Privilege + Luck + Effort + Voice = Your next achievement
- “You miss 100% of the shots that you don’t take” – Wayne Gretzky
- “Give people a reason not to forget you” – Richard Branson


Computer Science Major
What my friends think I do.
What my mom thinks I do.
What society thinks I do.
What my professor thinks I do in class.
What I think I do.
Google
LOL HOW DO I JAVA?!
What I actually do.
picloco.com

4. The Future

4. The Future: Placements

- In India: A lot of focus on competitive programming. Practice a lot.
- On-campus: Easier to crack. Should be a backup. Work quality is not assured. More people are not satisfied with their job than ever before. Odd semester.
- Off-campus: Difficult to crack. You know what you will be working on. Projects, network, profile helps you stand apart. Even semester.
- Startups appreciate expertise in the tech stack.
- Note for girls: DO NOT miss out on diversity hiring.

4. The Future: Master's abroad

- Lot of opportunities due to less population. Quality education, strong cohort, world class faculty
- Things they look for – GRE, GPA, Work exp, TOEFL/IELTS, Projects, Recommenders, SOP, Extra curriculars
- Expensive, but higher salaries. Getting loans is easier
- ROI: US > Europe > Australia
- Getting a PR: Canada = Europe > Other countries > USA

Higher education: GRE

- 340 marks exam consisting of Verbal and Quantitative ability.

  Accepted by US, Canada universities and some European universities

- Score range: 260-340. A 320+ score would be recommended. Score valid for 5 years. Multiple attempts possible.

- When to prepare for your GRE?:
  - Starting MS immediately after bachelors: Prepare in sixth semester
  - Starting MS after taking work experience: Prepare in eighth semester

Other options: GATE and CAT

- GATE – Useful to get admission into IITs, IISc. Can also help you get a PSU job. Worth only if you get a top school.
- CAT – Examination for MBA. Helpful if you get work experience, especially to crack a Top-3 admit.
- Others – There are many other fields out there. Pursue what you are good at! It is COMPLETELY FINE to pivot your career, but make sure your UG preparation is in accordance with your goals.

5. Everything Else: General Advice

- Coders: Make sure you are good at Data structures and Databases.
- People not interested in coding: Try working with Excel and other data tools like Tableau and Looker
- Always maintain a good GPA. It can be an entry pass to a game you know how to play.
- Focus on your habits than on your goals
- Watch less, read more. Speak less, write more. Work on your fitness!

THANK YOU!

Open for your questions and feedback ☺

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