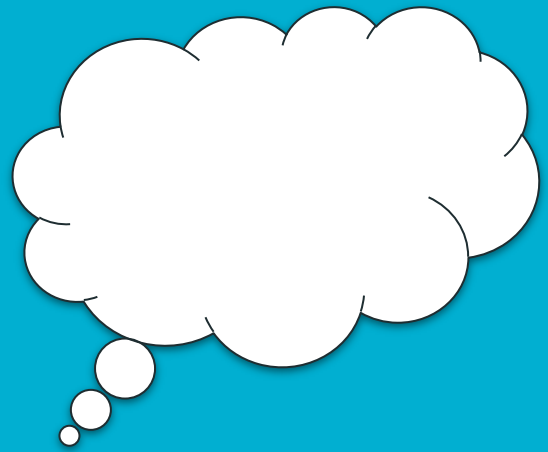
cepstrum



Intern Talk 2021

Why internship?

Learning

Experience

Chance to explore different career opportunities

Research Intern helps in Masters from foreign

#AndhaPaisa
#SummerSorted

Profiles

- SDE
- Data Science
- Consulting
- Core
- Open source

Internship

- Industrial Intern :
  - 2nd Year
  - 3rd Year
- Research Intern :
  - India
  - Foreign Research Intern

Kickstart your internship preparation

Eligibility

- CPI>= 7.5 is important
- CPI >=8 will give you an edge
- Companies put restriction on basis of branches
- Some companies eligibility includes students with minors as well

How to make your resume stand out

Projects

- Clubs (Coding club, SWC, Electronics, Robotics, CNA, etc.)
- https://www.fpga4student.com/ - core projects
- Youtube references (Clever Programmer , Web Dev Simplified)
- Projects done for Hackathons
- Projects under professor
- W3 schools - good to grab basics of development
- Coursera - financial aid

What should be your takeaway from a project?

How you implemented, core concepts behind it, etc.

Achievements

- Jee ranks/ KVPY/ NTSE
- Coding competitions rank - Google Kickstart, Codejam, ICPC, Facebook Hackercup, etc.
- Codechef, codeforces rating
- Hackathons selection
- Scholarships
- Kaggle - ML/AI

PORs and extracurriculars

- 1/2 PORs are good enough
- 1st year PORs are generally considered as volunteer/extracurricular work and are not considered as valid PORs (for 3rd year intern season)
- Workshops attended could be added in extracurriculars
- Cultural club participation

Hackathons - Achievements

- Club competitions - Coding club, CNA(summer analytics), SWC, Electronics Club, iitg.ai etc.
- https://dare2compete.com/ - Companies like Uber, Flipkart, Publicis Sapient, Myntra, etc. conduct hackathons on this
- Hackerearth - American Express Makeathon, HP Think-A-Thon, Xiaomi Ode to Code, Amazon Hackon, etc.
- Company specific hackathons - mails by CCD - direct interview opportunities
- Scholarship programs - Google Women Techmaker, Tower Research Capital, Institute Merit Scholarship, etc.

SDE

(Software Development Engineer)

Data Structures

- Array
- Pointers
- LinkedList
- Stack
- Queue
- Deque
- Hashmaps
- Heap
- Tree
- Graphs

Algorithms

- Sorting
- Searching
- Math
- 2 pointers
- Bit manipulation,
- Backtracking,
- Dynamic Programming,
- Greedy
- Graph Algorithms

Coding (for SDE, Quant, Analyst, etc.)

- C++ preferred language
- Hackerrank - Beginners
- Hackerearth - Basic algos
- Switch to giving contests on CodeForces, CodeChef, Atcoder(beginner level contests) - focus on logic development than rating
- https://cses.fi/problemset/ - Medium level algos
- https://cp-algorithms.com/ - for advanced algorithms
- https://www.geeksforgeeks.org/ - encyclopedia :P

Is it necessary to take a online course for DSA?

Coding Ninjas, Coding Blocks, Pepcoding, GFG, etc.

Resources for DSA

- Books
  - https://cses.fi/book/book.pdf (for topic reference)
  - Introduction to algorithms(CLRS) (detailed resource for algos)
- Youtube channels
  - Bucky's tutorial (C++ basics)
  - Abdul Bari (Algorithms)
  - Jenny's (DSA)
  - Aditya Verma (DP)
- Leetcode, interviewbit (particularly for internship/placement preparation)

CS Fundamentals

- OOPS:
  - GFG
  - Tutorials point
  - W3 schools
- DBMS:
  - https://www.studytonight.com/dbms/
  - Gate Smashers
- OS (minor importance):
  - Gate Smashers
  - Study tonight
- Networking (least priority):
  - https://www.geeksforgeeks.org/computer-network-tutorials/
  - Gate Smashers

Company Specific Topics

- Aptitude, Puzzles (GS , Adobe , cisco , oracle, Amazon etc.)
  - Brain stellar
  - https://probabilitycourse.com/
  - 50 problems in probabiltiy
- System Design (Uber):
  - Airplane reservation website, snake-food game, etc.
  - Youtube channel - Gaurav Sen
- Object Oriented Design (Uber):
  - Car parking, elevator problem, employee database, etc.
  - Youtube channel - Gaurav Sen
- Networking (Amazon)
- DBMS (Oracle)

Data Science

(Industrial & Research Intern)

Data Science – What to expect

- Some Slogging - Data Collection & Cleaning
- Some Reading - Algorithms & Parallelization
- A lot of Problem Solving
- And finally presenting your insights!

Data Science - Pre Requirements

1. Courses: Probability, Data Science in R/Python,Machine Learning
2. Hands On Experience: Pandas, Numpy, Matplotlib. Pyspark
3. Projects: Mock Projects, Real Life Data: Medical, Financial, Image & Video, Geotemporal etc.
4. Datasets : https://github.com/academic/awesome-datascience#data-sets

Data Science - Research Intern

- Shortlisting Professors
  a. Looking at interdisciplinary fields
  b. Looking at regions & colleges
  c. Shortlisting depts. And professors
- Collecting Mail IDs and research interests, papers etc.
- Writing them a genuine mail about your interest!

Consulting
(Analyst)

Brief Intro to Consulting

1. What is Consulting ? Types of Consulting
2. Work and kind of projects assigned
3. Career Advantages
    - Accelerated professional growth
    - High Pay
    - Opportunity to work on diverse range of projects - varied industries with multiple horizontals and verticals
    - Fancy Lifestyle involving lot of travel and stay at client locations
    - Amazing exit opportunities

How to Apply ?

1. On- Campus Recruitment
2. Cold Mailing
    - Draft personalised mails to prevent them ending up in spam
3. Linkedin
    - Update profile regularly
    - Strengthen the network through regular good posts
    - Connect with mid level managers of target companies for opportunities in the firm
4. Careers Section on company webpage
    - Check regularly for summer/ winter programs
5. Various Job portals (Not to effective)

Where to Apply ?

Tier 1

- Mckinsey
- BCG
- Bain

Tier 2

- Kearney
- Oliver Wyman
- Accenture Strategy
- Deloitte
- EY
- PwC
- KPMG
- Dalberg
- LEK
- Alvarez & Marsal

Consulting Resume

4 key sections in the resume - Education, Experience, PoRs, Extracurriculars

Key Points

- One page resume strictly
- Requirements of Peaks in the resume - 2 or more are appreciated
- Emphasize more on the impact rather than work performed (Use STAR framework for points)
- Avoid grammatical and spelling errors

What is a Peak?

- Education - High GPA, Research Papers, Scholarships etc
- Experience - Brand value of interned company, co-founded startups
- PoRs
- Extracurriculars - National achievements in Sports/Cultural, Social Work

Case Interview Process

1. Case Question/ Business Problem
    - Guesstimates
    - Profitability Case
    - Market Entry Case
    - Pricing Case
    - Unconventional Case
    - General Business Situation Discussion

1. Fit Questions
    - Typical HR questions - Intro, Why this Firm? Why Consulting? Future Goals etc

Practice Resources

STEP 1

- Case Interview Cracked YouTube channel
- Victor Cheng Videos on Youtube
- Aaditya Agarwal Playlist on Youtube

STEP 2

- Case Interview Cracked, Day1.0, Case in Point

STEP 3

- Consulting Books/Guide by Consulting Clubs of IITG, IIM-A, IIM-B, IIM-C, ISB etc.

Drive Link

General Read

- Daily Business News - Bloomberg
- Economic Times
- HBR
- Finshots
- Readon
- Mad Over Marketing

Core

Core-Digital

1) Digital Design - Morris Mano (5th Edition)
    a) Chapters 1-7 (Understand Chap 5 properly)
2) Read about Timing Analysis and understand terms like Slack Time, Hold Time, Setup Time, slew.
    a) "Setup and Hold Time Violation" : Static Timing Analysis (STA) basic (Part 3b) |VLSI Concepts (vlsi-expert.com)
3) Digital Integrated Circuits- Rabaey(Chapters 5,6)-For CMOS
4) Be thorough with verilog
    a) “Fundamentals of Digital Logic with Verilog” by Z Vranesic - For better understanding of verilog.
    b) Have at-least one good project on verilog.
5) Courses- Digital Circuits

Core-Analog

1) Courses
    a) Analog Circuits(EE206) -Follow this course, you will get an idea whether you want to pursue in this area or not. Almost all topics covered in this course is important
        i) Feedback Circuits-Opamps, etc...
    b) EE101- Should be strong in basic circuit analysis.
        i) Hayt and Kemmerly - Circuit theory
    c) Basics of Control Systems Course(EE 250)
    d) Basics of Signals and Systems Course(EE220)
2) For CMOS
    a) Design of Analog CMOS Integrated Circuits – Behzad Razavi
3) Digital Integrated Circuits- Rabaey(Chapters 5,6)-For CMOS

Open Source

Open source is source code that is made freely available for possible modification and redistribution.

Some of the open source programs are GSoC, GSSoC, MLH,etc.

Google Summer of Code

Google Summer of Code (GSoC) is a global program that matches students with open source, free software, and technology-related organizations to write code and become part of these communities while making some money along the way!

https://summerofcode.withgoogle.com/

- Steps:
  - Remember the dates!
  - Start Contributing to Organization.
  - Prepare a good proposal.
- Proposal
  - Project overview/About yourself
  - Research or Ideas
  - Deliverables
  - Timeline
  - Contributions
  - Questions (like contact details,locations etc. depend on organizations)

Note: Be realistic in your timeline.

Some Good proposals from IITG (2021)

- Machine Learning for Turbulent Fluid Dynamics by Amey Varhade.
- SCoRe Lab Open MF Proposal by Swapnal Shahil.
- Boost_Real_Proposal by Divyam Singhal.

BLOG: Google Summer of Code