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# Intern Talk 2021





# Why internship?

#AndhaPaisa  
#SummerSorted

Learning

Experience

Chance to explore different  
career opportunities

Research Intern helps in Masters  
from foreign

# 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

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- CPI  $\geq 7.5$  is **important**
- CPI  $\geq 8$  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

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- 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

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- 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

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- 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

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- 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.

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# **SDE**

**(Software Development Engineer)**

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

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- 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

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- 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

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- 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

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- 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](#)
  - <https://gist.github.com/vasanthk/485d1c25737e8e72759f>
- Object Oriented Design (Uber):
  - Car parking, elevator problem, employee database, etc.
  - Youtube channel - [Gaurav Sen](#)
- Networking (Amazon)
- DBMS (Oracle)
- MCQ practice:
  - <https://www.sanfoundry.com/>



# **Data Science**

**(Industrial & Research Intern)**

# Data Science – What to expect

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

# Data Science – Pre Requirements

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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

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- 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!

# Sample mail

Dear Ma'am,

I, **Adit Jain**, am a sophomore undergraduate pursuing my B.Tech. In **Electronics and Communication** at **Indian Institute of Technology Guwahati**, India. I am writing to you for the possible opportunity of a Research Project from **May to July 2020** under your able guidance.

My interests include Information Theory, Control Systems and Psychology. I have read some popular literature which drew upon Neuroscience. I was reading a paper on Genetic dissection of neural circuits when I came across your work on the remote control of neuronal activity. I want to use my skills, expertise and potential in solving problems in the field of Neuroscience. I found your research on deciphering the neuronal circuits disruptive and of interest to me.

Although I don't have a strong background in Neuroscience, I do have a varied research background combining different fields of Electronics, Mathematics and Computer Science. I have done several projects in the fields of Machine Learning, Signal Processing and Data Analytics.

I have taken courses like Control Systems, Signals and Systems and Theoretical Foundation of Computer Science. I have an excellent academic record and have sufficient practice of working with a variety of programming languages (Python, Matlab, C, C++) and tools (Pandas, Scikit-learn, Numpy ).

Attached herewith is a copy of my [curriculum vitae](#) and [transcripts](#) for your kind perusal.

I would love to read up more on specific topics that may be required or work remotely so that I would arrive fully equipped before the project. I am positive my work shall be of considerable worth to you in the research domain.

If I get consent from you then I'll be applying for Charpak Scholarship for the same.

I'll be highly grateful for your kind attention and looking forward to your reply and dialogue.

Thanking you.

Yours sincerely,

Adit Jain,

Sophomore Year Undergraduate Student

Electronics and Communication Engineering (B.Tech.)

Indian Institute of Technology, Guwahati

Mobile:- +91-8750407639

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# Consulting

(Analyst)

# Brief Intro to Consulting

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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 ?

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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 ?

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## Tier 1

- Mckinsey
- BCG
- Bain

## Tier 2

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

# Consulting Resume

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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

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## 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

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## 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.

## General Read

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

[Drive Link](#)

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# Core

# Core-Digital

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- 1) Digital Design - Morris Mano (5th Edition)
  - a) Chapters 1-7 (Understand Chap 5 properly)
  - b) [Digital Design \(nitsri.ac.in\)](https://nitsri.ac.in)
- 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) [chapter1.PDF \(wordpress.com\)](#)
  - c) Have at-least one good project on verilog.
- 5) Courses- Digital Circuits

# Core-Analog

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## 1) Courses

- a) EE101 basic electronics
  - i) Hayt and Kemmerly - Circuit theory
  - ii) RLC Circuits
- b) Control Systems Course(EE 250)
- c) Basics of Signals and Systems Course(EE220)
- d) Analog Circuits(EE206)
  - i) Feedback Circuits- Opamps, etc...
  - ii) Semiconductor devices - MOSFET

## 2) References:

- a) [http://www.ee.iitm.ac.in/videolectures/doku.php?id=ec1010\\_2014nk:start](http://www.ee.iitm.ac.in/videolectures/doku.php?id=ec1010_2014nk:start)
- b) <http://www.electronics-tutorials.ws/>
- c) <http://nptel.ac.in/courses/117108107/>

# Open Source

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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

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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:

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- 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)

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- [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](#)

# Speaker Contact Details

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- SDE
  - Piyanshu Jain : 6261317693
  - Shreya Goel : 8218944761
  - Dibya Darshney : 95993 40259
  - Kautilya Pandey : 6394 834 104
- Data Science
  - Adit Jain : 87504 07639
- Consulting
  - Utkarsh Gupta : 98112 53240
- Core
  - Korada Pavan Kumar : 88760 49966
  - Gangiredla Bala Ratna Swamy : 96132 44888
- Open Source
  - Swapnal Sahil : 92057 11402

# Official IITG resume templates

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- <https://www.overleaf.com/latex/templates/iit-guwahati-resume/fvqtpmzhvxn>
- <https://nitish6174.github.io/resume-generator/>