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A Recipe For The Dream Career: In conversation With Jayesh Mahapatra




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The quintessential computer geek and a machine learning enthusiast as he likes being called, Jayesh

Mahapatra pursued his Bachelors in Computer Science and Engineering at VSSUT. A student of

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CERN in the summer of 2016, and his high GRE scores as well as his plans for MS, abroad.

Recently Team VISSION got in talks at length, with the humble genius where he recapitulated his internships and shared his plans for the future and what it takes to be the person he is today.



Team VISSION: First of all, congratulations for your achievements so far. Please tell us about your summer internship.

Jayesh Mahapatra: I applied for the **CERN Open Lab Summer Student Program** at CERN (European Organization for Nuclear Research) headquarters, situated on the Franco-Swiss border. It was a 9 week long internship. I stayed that period at Geneva. It's an important hub for computer scientists all over the world.

TEAM VISSION: What exactly does the big shot CERN do? How are undergrads placed there?

Jayesh Mahapatra: At CERN there are many projects carried out simultaneously using The Large Hadron Collider (LHC). It is the world's largest and most powerful particle collider. The three major detectors which are used to carry out the experiments, are ATLAS, CMS and LHCb. 10,000 scientists from the participating countries work on these experiments. Each experiment has teams from various participating universities like MIT, Caltech. Each of these teams consists of 6-7 PhD students and 3-4 postdocs and professors. They are stationed there for a minimum of 5 years. Undergraduates work under these

professors and work to formulate the algorithms to carry out the experiments.

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WORKING FOR :

Jayesh Mahapatra: I was placed in the CMS project under California Institute of Technology (Caltech). I had 2 supervisors, Maurizio Pierini, physicist and board member of CMS, and Jean-Roch Vlimant Assistant scientist from Caltech. So what happens is that protons are accelerated near to the speed of light and then you collide them. So at CMS when they are collided there are different layers of detectors and each layer of detector is designed to detect a specific kind of particle. As the complexity of these experiments increase, it is really difficult for a human to sit and work out the physics. To detect the reaction which a detector will have for a certain kind of particle, is where machine learning comes into play. In machine learning the machine is programmed and data is fed to it so in future it almost accurately detects what is certain particle is likely to be. So my project was basically to formulate that machine learning algorithm. Our project was an accessory for the CERN Vision 2020.

TEAM VISSION: How did you apply for the program? What was the process?

Jayesh Mahapatra: The CERN posts all the internship programs on their home page. All the notifications of the various programs are held out there. While applying, I just had to specify my area of interest. Then I sent my CV, which was followed by answering the statement of purpose. Lastly, I had to appear for a written questionnaire which consisted of technical and aptitude aspects. Then I had to give proof for my area of interest which was machine learning by showing apt projects in order to validate the application. The determining factors were the projects that I completed. I uploaded them on GitHub and mentioned the links in my CV for perusal by the concerned authorities.

TEAM VISSION: How did you discover that your passion lies in research?

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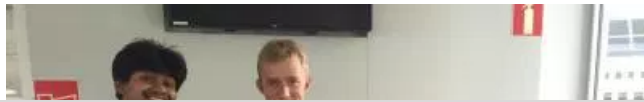
what I had to decide was whether I wanted to go for an internship or for research. I preferred to choose from the trending topics viz IoT, Big Data, Machine Learning, and Artificial Intelligence. I devoted myself to studying all these. These are basically Grad courses so I did not find them in the undergrad textbooks. There were various sites (Coursera, Udacity, edX) which provided these courses online along with a certificate. I went through the courses they offered and then messed with them and finally discovered that I had to go for Machine Learning. Then I, completed the course I opted for, did few projects and uploaded them on GitHub. Then I applied for these foreign R&D internships. For students from the other colleges (he meant the Indian big leagues) the exposure is vast. They're already working under eminent professors, have a handful of these internships, and have proper guidance and stuff. Being from a college like ours, one needs to have a lot in their basket by the time applications are out.

TEAM VISSION: So how did you start learning Machine Learning?

Jayesh Mahapatra: See, Machine Learning is a graduate level course. It is basically a mathematical course. I strictly followed the fundamental Machine Learning course laid out by Stanford University from the online website Coursera. After the completion of this basic course you move on to next level that are the Stanford lectures. These are highly mathematical sscourses. So I had to first go through the calculus theory and probability theories and then moved ahead with those lectures. Also laying down the algorithms is important. You may implement them in whatever language you wish.

TEAM VISSION: Who guided and motivated you to apply?

Jayesh Mahapatra: Taking up an internship in



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research and development is not really common out here but I already had my goals set. After my second year, I did my internship at IIIT Chennai, where my mentor encouraged me to go for masters abroad. After that I researched about the prerequisites for a masters' abroad. I realized that I needed a stellar profile and at least a few publications and all. That is when I decided that I needed a good research internship to uplift my entire profile. So that is when I came across the CERN open lab summer student program. Also I never thought that any internship or job is too good for me.

TEAM VISSION: Coming on to the most important question, what major differences did you come across in the work culture between here and at CERN?

Jayesh Mahapatra: There is a certain level of independence which comes when one works abroad. The students' ideas and opinions matter as much as the students do. There also a sense of freedom that follows when such culture is adopted and spoon feeding is strictly overruled out there.

TEAM VISSION: What were the major challenges that you faced in the entire process?

Jayesh Mahapatra: The first and foremost problem is obviously monetary. Economically, it hurts initially but then you get used to it. Also since it is on the Franco-Swiss border, language sometimes is a problem in the day to day life. Otherwise if you're fluent in English you are good to go. People were helpful. The climate there is a

stark contrast to ours. So going through that was an issue. Food is a major issue because these are

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these are costly and a quick mental calculation is always needed here and then.

TEAM VISSION: How did the formalities of our college pose as a hurdle in your way?

Jayesh Mahapatra: The biggest issue was regarding my attendance. As it was a 3 month long internship, I had to miss a month long classes and that was a big deal. So I had to do rounds of the academic block to get the permission. Second was the issue which came up when I was happily working at CERN which was related to my registration to the next semester which needed me to be present in person. But then eventually it all got handled.

TEAM VISSION: So what are your plans after graduating?

Jayesh Mahapatra: After College, I aim to be an independent researcher in machine learning. I need much more specialized training that I have right now. So currently during summers, I'll be heading to Aalto University, Finland for three months. They are working on particles at Nano level and I'll be working on Machine Learning there.

TEAM VISSION: How did you manage time and made it all work out?

Jayesh Mahapatra: I'm not great at time management. But I'm a night worker so that helps in do a lot in a short span of time. I used to work for the Coursera course during endsems too.

TEAM VISSION: Was it was a paid internship? If yes then how much did they pay?

Jayesh Mahapatra: Yes it was a paid one. I got a stipend of INR 6 lakhs and I saved pretty much half of it. Also I'd like to add that people should aim for paid internships. Because what good is going for an internship that is unpaid, takes all

your skills and also sends a wrong message to the recruiters that you're not good at what you're

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TEAM VISSION: What impacted you the most at CERN?

Jayesh Mahapatra: CERN is different from most internships. It is a hugely multicultural hub. People from 160 countries work there. The whole experience was educational and a lot of fun. My roommate was Italian. I made friends from a lot of countries. Working with these people opens up your mind and widens the way you perceive things. So basically I have friends from all the European Countries (laughs).

TEAM VISSION: What did you learn as a technical enthusiast?

Jayesh Mahapatra: Basically no job is too good for anyone. Never underestimate your worth. Also, try out all the alternatives you have. No one knows which one will open a door of opportunities for you.



TEAM VISSION: Would you like to share some memorable experience from your stay at Geneva?

Jayesh Mahapatra: Initially I overworked my laptop and the CPU fried. I told my supervisor about it. Within one day he actually arranged a brand new MacBook pro for me. I had expected a decent laptop but this one amazed me. Gradually the computations started getting complex and to

my utter amazement I was granted access to a super computer for a day.

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college grades as far as the target picture is concerned?


Jayesh Mahapatra: College grades don't matter as long as one has decent grades. The point is as far as internships and master's abroad are concerned, managing a decent pointer between 8-8.5 on the scale will do no harm. Considering the competition out there, there might be instances where one can get filtered out due to some minute difference in grades. So never neglect college grades as they determine the initial impression of a candidate.

TEAM VISSION: What do you think should be the changes made here, to promote such internships and higher education?

Jayesh Mahapatra: One important thing that needs to be done is internships should be made official and not just focus on industrial training. The last 6 months of the B.Tech could be directed towards full-fledged internships which in-order will improve the placements too because all of the top-notch companies like Intel and Flipkart look for candidates with internships of greater duration. Just a summer internship of 2 months never paves way for a good job placement. Attendance related issues should not be a big issue if the internship is worth it. Student Counselors should be there who can guide students and help them explore all the possibilities during and after engineering. Minor projects should be introduced from the very 2nd year itself in all labs so as to keep up with the latest trends and not just sulk away with some bookish knowledge. Rote learning should be discouraged.

TEAM VISSION: You had also appeared for GRE. Can you share your score? How different the admission process through GRE is, as compared to here?

Jayesh Mahapatra: Yes I appeared for GRE and my score is 327. In India we are accustomed to

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is the GRE score after the examination and then we apply to the colleges of preference and send the GRE scores to them along with the resume and state of purpose. I have applied for master's at a few places. I'm waiting for the Canadian and German schools to write back.

TEAM VISSION: Any suggestions for you juniors. And how to prepare for internships?

Jayesh Mahapatra: Along with Curricular, focus on learning something that is new and trending in your field. Just knowing how to program in legacy languages or just memorizing what is in the books has never done any good to anyone who is interested in the field of research. There are major differences in what is being taught at college and the requirements laid out by the university. Build up your profile. There is a dire need to explore all the possibilities you guys have and work accordingly. There are many opportunities out there. Practice writing Statement of Purpose. Prepare a good and brief CV. Put up valid qualifications on the CV. Build up your skills and mention them in CV.

TEAM VISSION: Lastly, a few words for Team Vission.

Jayesh Mahapatra: You guys work admirably. I wish team vision all the good luck. May you keep up to the legacy of your seniors.

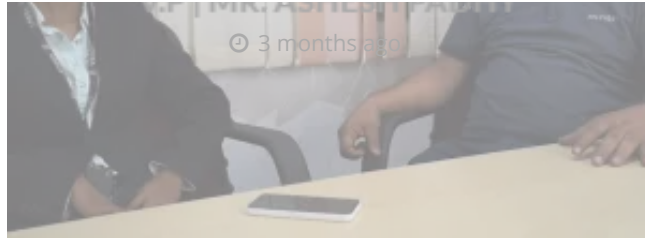
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