

bitStream

CSE Department Newsletter | 2020 Edition

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HOD SPEAKS

PROF. UMESH BELLUR

Prof Umesh Bellur signed up as the HOD of CSE department in May 2019. As part of the newsletter, we got a chance to interact with him. We asked him questions regarding various aspects of our department ranging from infrastructure, covid-19 effects to ideal courses. We also talked about what could be the future focus of the department in terms of courses and research aspects.

JOURNEY TO IITB

I met my partner when we were both students at Syracuse University, pursuing our masters. After our masters, she moved to the Bay Area and took up a job while I stayed on for another three years and finished up my PhD. When I went to the Bay Area, it turned out to be a fascinating place where things were happening. I got totally caught up in that excitement and joined a small startup in Berkeley, CA, which was looking to build a commercial version of ideas I had covered in my PhD Thesis. Since it was a startup, all of us did a bit of everything - product design, development, testing, sales support etc. I worked there for four years, built the product and helped with sales and sales support.

With this experience, I got a number of other offers - I joined Oracle in the role of a standards evangelist working with OMG and enterprise Java standards. I couldn't stand the big-company culture, so I went back to another startup and worked there for three years. In late 2000, I co-founded a company called Collation with two of my ex-colleagues. We managed to raise about 12 million dollars.

After these experiences, I was looking to get back to academics. I had also been teaching some courses at UC Berkeley extension campuses in the South Bay. We were also thinking about returning to India and decided that these two things should happen together. By then, IBM was interested in acquiring Collation. I took a short trip to India to interview with a few institutes. Madras was quite dull and conservative. Bombay was, by far, the most exciting visit that I had in terms of academics. Prof. Phatak's infectious enthusiasm and optimism convinced me that this was the right place to come to. The first interview that I had for IIT Bombay was in the San Jose airport with Professor Kriti. I returned home, and Collation was acquired, everything seemed to be going in the right direction. It was a bit of an adjustment for me coming back to acads from the industry as there I was building software and patenting, not publishing papers and took me almost 2-3 years to settle into academic life. The adjustment of moving from the US to India was nothing compared to the adjustment in moving from industry to academics. Anyway, I did settle down finally with the help of many faculty colleagues here. Since then, I have had little to complain about.

AVERAGE DAY

I catch up with the office staff in the morning about things we need to take care of that day like certain academic deadlines to be reminded, papers to be signed, purchases, etc. I set aside time to interact with students over the week. I also discuss potential projects with faculty colleagues - some of which eventually culminate in a proposal to the industry or government for funding.

Regarding the division of my work, about 20 per cent is administrative work (approvals, committee meetings etc.), another 15 per cent goes into planning, contacting alumni for raising funds, looking at infrastructure needs etc., around 25 per cent goes into teaching - planning for classes, delivering lectures, setting assignments etc., 30-35 per cent for research and around 5-10 per cent for consultation with industry and government, mostly within India. I'm on the board of a couple of companies as well as in the advisory groups of a few.

The typical day has not changed since the pandemic started; the only thing is that it is now online. It's just that I don't see people anymore.

EXPERIENCE AS HOD

After being appointed the head of the department, life has become a lot more hectic. Although I continue to teach and guide students, administrative responsibilities have taken up a lot more of my time than it used to. One of the top priorities for me was and continues to be fundraising so that I could leave the department comfor-

-tably placed with an endowment. So I started reaching out to alumni, particularly in the bay area where I have some connections. The initial response was encouraging and I visited the bay area to meet with some of them. However just as we were gaining some traction, the pandemic happened and the efforts were put on hold. And now, we are in a bizarre semester.

That's the only word, and the situation is that we will be having another online semester. Nowadays, the majority of my energy goes into trying to ensure no students get left behind. We have spent a lot of energy on figuring how to effectively run an academic institute online and are hoping to be back on track with a more "normal" semester by Autumn of 2021.

ON INFRASTRUCTURE

Having added a fair bit of space with the new CSE building, we have had our fair share of problems with it. After a long period of construction, we seem to have ended up with a maze of walkways and overhangs which require state-of-the-art pathfinding algorithms to navigate. There have been some significant fixes. For example, we have had to deal with water leakages during monsoons. Much like production-level code, it is an ongoing saga of fixes, patches and features. The department still hasn't lost hope though, and we think we can turn this around eventually with help from the institute and donations.

There still are some silver linings. The building has given the department much-needed space. Some of which is being planned to be used for lounges. Yes, the next time most of us step into the institute, we'd see some progress towards the faculty lounge, the student lounge and a large conference room. Space has been earmarked for the faculty lounge on the 5th floor and student lounge on the 4th. We are well into the process of acquiring furniture.

We have always wanted some areas where people could get together and just chat. All the open space of both the buildings should be just one huge lounge. With nooks and crannies for students to hangout, boards lying around to be scribbled on. We want an atmosphere of academic discourse happening throughout the building.

HIGH DEMAND FOR MINOR

My perspective is that everybody who wants to do a minor should be given a chance. It is good to provide a chance for anyone who wants the opportunity. We have raised enrollment limits from around 30-40 to around 80-100 to enable more students to sign up for it. Raising the limits is indeed possible as long as good TA support is available.

There is a massive demand for CS. Other avenues are opening up as well. You must have heard of the Centre for Machine Intelligence that the institute has just started. There are also plans for an IDDD program for DSA and ML starting next year, where any BTEch student from any department can get a masters in ML and Data Science. We are planning to launch another IDDD programme for MS by research soon. We used to have MS by research as an exit degree earlier for people who started a PhD but could not complete it. This is now redefined to be a high-end research programme at masters level relative to MTech, which has a much more significant coursework component to it. This will be open to students of other departments by IDDD programme.

PLAGIARISM

ICPC was a regrettable incident. None of us could've foreseen anything like this happening. IITB has a reput-



-ation that it has to protect. And once you get to the top, you have to maintain it.

We need to take some concrete steps. For every incoming batch, we are already doing some sensitisation, which has to be reinforced continuously. I have talked to the FacAds to make sure they keep an open dialogue, particularly about this item as well. ICPC, in particular, is all run by students. We are coaches, but only on paper. Other than that, the faculty are not involved. I would like to change this a little bit. If as a department, we want to be serious about ICPC, we should invest faculty resources from our side.

Seniors have a lot of influence on incoming batches. Batches develop a rapport and listen to a lot of their seniors have to say. We should use that. Not just in terms of achievement but also the kind of culture we have in the department. We need to work together to make this a better place. I don't want it to be on paper. Not just this, but everything else, including BTPs, RnDs, Seminars and MTPs. We want people to be involved or say no. We need to develop a competitive culture, but not at this cost.

ON THE PHD STRENGTH

I feel that we, as a society, do not value a career in research and academics as much as one in the industry. One of my students around 5-6 years ago got selected for a PhD at Georgia Tech, but his parents were totally against it. It was unbelievable for me as it was an opportunity of a lifetime. I then visited Ahmedabad to talk to his parents. For example, having a 30lpa job seems like an excellent culmination of the efforts that you put in as far as parents are concerned. To not earn anything and live as a student for another five years isn't easy for many parents to come to terms with.

Certain long term factors also come into play as well. Most would think you'll end up becoming an academic after doing a PhD thereby earning less than with a corporate job. "By heading abroad for a PhD my only child may not return and help me live the older years of my life." This type of thinking is quite prevalent amongst Indian families.

As faculty, we are judged and promoted largely on our research outcome. Every faculty is involved in publishing, maybe not at the same rate. It is not the same as a second or third-tier college in India where only a few of the faculty would be doing research.

HIGHER STUDIES vs. INDUSTRY

As a faculty member, I would like to see each one of my students go on for higher studies. I've always tried to convince my students of the same. The world is also changing at a rapid pace. Software testing twenty years ago was the job of a professional, while today it's being automated. This is real, and this is going to be with us for a long time.

I feel that a Master's degree would be advantageous to explore what a career in research may be like and see whether one would want to continue on for a PhD. I believe that with the superior educational base that our students have here, you should be thinking of research as a career. Our students get more exposure to research than many other institutes in India which you can take advantage of. If we were to train the next set of researchers, you would be it. I would want to see most of the batch go on to finish a PhD.

UNRAVELLING THE UNCOMMON

Moving towards FinTech and Start-ups



NISHEETH LAHOTI

Co-Founder at Rephrase.ai

2011-15

Hi Nisheeth, A quick word about you and what all projects you are currently working on?

I'm co-founder at Rephrase, where we generate videos of people speaking, given just the text as input.

How was your experience at IIT Bombay? What are your most cherished moments from college?

Absolutely amazing, though a little wasteful. I didn't make a great use of the opportunities I had, but I don't think I've had this much fun before or after. I'd most cherish randomly going to any friend's room and spending a lot of time on anything and everything: from card games to LAN games to philosophical discussions to really bad puns. That seemed like the least eventful part of life back then, but I just miss having that much free time to spend, and enough also-quietly-free friends to spend it with.

What were your thoughts when you appeared for the placements in the final year and how did you shortlist the companies for which you would interview? Also, how does it feel to be on the other side of the table now?

I'd always wanted to do either a startup, or failing that, theoretical research; but didn't plan my way through things properly and ended up sitting for placements after all.

I've always enjoyed mathematical work a lot, so a quant job seemed like the most interesting line out of the placement options, but I felt at the time (based on some advice I agreed with) that if you look back after a few years, you should be able to point to something with "I built that.", and quant or finance roles wouldn't have any element of it. So I decided to go for programming jobs as a first priority (with Google being the obvious first priority). I'm not sure how much I agree with that line of thinking now, by the way. While I still think trading is mostly zero-sum work, I'd pay a much higher premium on interestingness now, compared to impact - which is something you can have more of at a slightly later stage in life anyway.

Then again, in my current work, I get to build something while solving some fairly interesting mathematical problems, so at least that worked out for me.

What motivated you towards forming a startup? What made you choose that path over a dream job at Google, London?

My job at Google London, as I realized once I joined, wasn't much of a dream job for me. While they have a great culture, and great perks, and some pretty good work in some enclaves, the work I'd been assigned didn't match my interests at all.

Hi Someshwar, a short introduction about yourself?

I'm currently the Vice President with the Franklin Templeton Fixed Income Group where I manage a team of Quantitative Analysts and Data Scientists. Prior to joining the firm in 2014, I was a research associate at Morgan Stanley and was a part of the Agency MBS Strategy team. I have also worked with Nomura as a Technology analyst with the CMBS Trading Desk. I'm also a charter holder with Chartered Financial Analyst (CFA) and with Chartered Alternative Investment Analyst (CAIA).

How was your experience at IIT Bombay? What are the most cherished days from your college?

College was great. I did make a lot of lifetime friends, studied (a bit), was part of the core team of Techfest and met my wife at college :) Trying to balance academics with some of the other stuff I was pursuing was tough - but remains a cherished period of time in my life.

When and why did you decide to venture into the finance sector? Is it ok for the fourth year undergraduates to aim for financial firms during their placements?

I used to follow the markets as my dad used to invest in stocks (before college) and that was my only exposure to this sector. I really didn't choose finance, but more like my first job was in a fin company and I liked it. Shifted a couple of roles to get to that role which I liked and I am happy my experimentation paid off.

You can get into any company as long as you like the role and it excites you. It may not be the first job right after college, but as long as you keep trying and expanding your USPs, eventually, it will pay off. Don't be afraid to experiment :)

How did the background in CSE help you, especially from IITB, if it did at all?

I hated coding during college, was always hoping that I get a non-core job where I will never need to open an editor! But 10 years down the line, I can't spend a day without coding. I think it takes time for everyone to appreciate what they have learnt at college, for some it's useful immediately and for some, the ROI (return on time invested) comes later, but it will eventually come.

What were some of the toughest challenges you had faced throughout the journey?

Understanding what excites you and reaching that will take time and sometimes may be tough. Typically in

Don't think that means you have to quit, by the way, it could well be possible to get somewhat more interesting-to-oneself work by insisting on it, but I didn't quite realize it at the time. I did probe lots of people who'd started work at about the same time as me, both in Google and in other companies, about the work they were doing. And hardly any of it appealed to me. That was one reason for looking for startup ideas instead. Another was that the correlation between the kind of work you do and the rewards you get for it seems to be better in startups than anywhere else. Sure, there's a big element of luck, but by and large, if you consistently do great work, there's a high chance of being rewarded handsomely for it—and on the flip side, if you fail, there's no one else except yourself to blame for it. Both of those things are big pluses in my book.

How big of a role did CSE, IITB play in your journey from forming an idea to building a successful business?

I got started on the whole startup thing a while after leaving IITB, and my other co-founders aren't from CSE, IITB either, so directly, not that big a role. But indirectly, it was absolutely critical:

- My other co-founders in SoundRex (the company I co-founded just after my Google job) were all from IITB. I wouldn't have co-founded anything had I not known any people like that, and I wouldn't have known people like that if not for IITB.
- The current product we're working on is very much a computer-science idea, something I've developed an interest in mostly due to my CSE education.

“If you consistently do great work, there's a high chance of being rewarded handsomely for it”

When did it all begin? What/who helped inspire the idea behind the start-up?

I keep a whole list of far-fetched things I'd like to someday create. One item on that list, since about my second year, was a tool to take any script of a movie as input, and generate an entire movie out of it (other items are things like "A program that can do high-level maths better than the best mathematician" and "theory of everything in physics"). The list isn't quite a to-do list, and isn't quite an if-I-were-God list, but it's closer to the latter than to the former. One day, in SoundRex, over lunch, we'd been discussing things we'd really like to make, given enough time/money/resources, and this came up. Some time later, Ashray

a core finance role, especially in asset management, needs a lot of effort in terms of hours put in for designations and understanding the subject matter. Juggling job and family with this extra load has been demanding.

Given the current shift towards a digital economy, what are the niches w.r.t to the finance field, according to you, which have the potential to grow in coming times?

Globalization of jobs, especially given how covid has all forced to work from home will open up a lot of avenues for us. The Indian Finance market is also poised to grow leaps and bounds. So I am confident the future looks bright for fintech professionals.

Advice that you would like to give to your younger self who has a lot of ideas and wants to venture into the finance field?

Meet as many people as possible, make more connections, expand your professional network. Be ready to pivot and don't be afraid to do that. Read a lot of books.

SOMESHWAR MAREPALLI

VP at Franklin Templeton

2006-10



(co-founder and CEO at SoundRex and then Rephrase) came across some videos showing crude facial re-enactment, and realized that it was a great time to work on this problem. I felt like this would at least be a starting step in the direction of arbitrarily manipulating videos, and if things went well, we could gradually move towards generating entire movies this way.

What are your plans for the future in regards to the start-up? Especially when we expect a major recession in the post COVID era?

Making sure that our burn rate is low enough to last a long time while creating something good enough by then that we can earn off it. It helps that we have enough funds and a good enough team to be able to do that right now.

Given the current shift towards a digital economy, what are the niches, according to you, which have the potential to grow in coming times?

We're banking on more and more things moving from text to video, something that seems to be a trend already. Personalized emails that you get. Reach out for marketing, chatbots. Educational material.

A piece of advice that you would like to give to your younger self who has a lot of ideas and wants to become an entrepreneur?

Instead of me, take advice from people like Paul Graham, Naval Ravikant, Patrick Collison, Patrick McKenzie etc. Seriously, there are so many people, with much more demonstrable success in entrepreneurship, who write insightful things for free on the internet. That said, work a lot on side projects (which might or might not involve working on a lot of side projects). Doing a job before starting a company has some pretty significant advantages: You get to learn a lot from more experienced people and companies. You end up with some money in your bank account, which shields you from getting side-tracked doing tiny fund-raises, or panicking too much when funds are running low. Startups take longer to succeed than most people initially imagine. Get into one assuming it's going to take several years of your life. Never compromise on your health. Whatever you're compromising them for probably isn't that urgent, and can wait a bit. It's easy to get lost in the weeds of whatever you're doing and end up doing very sub-optimal things as a result. Always take some time to zoom out and think of the big picture. (though most of your work should still be zoomed-in and in-the-weeds). Joining an accelerator (like Y-Combinator or Techstars) is probably a good idea at this stage. If nothing else, it lets you have a lot of other founders in your circle.

RESEARCH GROUPS

Here's a descriptive list of the areas in which research activities are undertaken in our department, along with some of the popular electives in the same.

SECURITY & CRYPTOGRAPHY

Security and privacy concerns hinder progress in applications like internet voting, e-commerce, and universal medical records. This group involves both theory and practice, from proofs of security through algorithm and protocol design to safe and secure applications.

CS 741, CS 765

PROGRAMMING LANGUAGE & COMPILER

Research in this area focuses on various language and implementation issues: how language constructs influence the way computations are performed; how to reason about the behavior of programs; how to translate programs efficiently and effectively into low-level code; and how to improve the performance of code.

CS 613, CS 616, CS 618

FORMAL METHODS

Associated with development and improvement in techniques used to model complex systems mathematically to verify properties of systems, from banking and trading sectors to mission-critical satellite launchers.

CS 433, CS 713, CS 766, CS 738

COMPUTER NETWORKS

Computer networks allow computers to communicate with one another and form the backbone of the Internet. This is a high-impact area that reflects a variety of subtopics like distributed networking, network security, and internet of things.

CS 681, CS 741, CS 756

AI & ML

AI/ML encompasses many application-based fields based on a variety of techniques to handle data and make intelligent predictions, and is a very active field of research. Some major applications are speech recognition, machine translation, medical diagnosis, algorithmic trading, and self-driving cars.

CS 626, CS 747, CS 768, CS 621, CS 753

VISUAL COMPUTING

This is an exciting group which studies how computers perceive, process, and understand visual data like images, videos, and 3D models. Major subfields are image processing, computer vision, and graphics; and applications are found in robotics, medicine, quality control, AR/VR, VFX, and computer games.

CS 475, CS 663, CS 736, CS 763

REAL TIME & EMBEDDED SYSTEMS

A combination of software and hardware, these are application-oriented systems with timing constraints. Applications include GPS, Missile Guidance Systems, ABS, Rovers, Robots, and many more.

CS 684

SOFTWARE ENGINEERING

Software Engineering is the backbone of applications and systems all around us. Research in this field is a relatively new idea that focuses on accuracy, reproducibility, and reusability of software to solve many real-world problems.

CS 770

THEORETICAL CS

Theoretical insight in CS is often highly relevant and sometimes even necessary for practice. The practitioners of this field are concerned with understanding, formally defining, and analyzing concepts in topics like algorithms, combinatorics, optimization, cryptography, and complexity theory

CS 601, CS 604, CS 760

DATABASE & INFORMATION SYSTEMS

This involves optimization in collecting, organizing, querying, and distributing data, whose importance grows at an unprecedented rate. Many software systems rely on research in this area to manage and extract information from data.

CS 631, CS 635

DISTRIBUTED SYSTEMS & CLOUD COMPUTING

This field studies the design and behavior of systems that involve many loosely-coupled components along with their reliability, security, and portability. Theoretical aspects involve analysis of game-theoretic algorithms while applied work is in system design and parallel programming.

CS 695, CS 744



A SEMESTER ABROAD

EDUCATION RESOURCE CENTRE



MAYANKA MEDHE

I am not atma-nirbhar, I am coffee pe nirbhar

How did you get to know about semex?
Semex for me had always been an exciting getaway from the usual rigorous curriculum. I got to know about it through the Instagram stories of our seniors and had since wished to go on one if I ever get a chance.

How did you apply for it? Why did you decide to go for a semex?
I always wanted to try out studying at a university abroad. For me, it seemed like a lucrative option of getting better grades, a LOR for my master's application but most of all, I wanted to explore a new place, not like a tourist but like a local living there. After a lot of research, I decided that the sixth semester would be the ideal time for a semester exchange. I already got my intern for the summer, and I didn't mind doing the unmapped courses in my final semester as the workload is the least in that semester anyway.

How did you choose the university for semex? What were the fee and scholarship structure?
My first choice was NUS because that is where most of our seniors had gone. Getting turned down at NUS made me more determined to apply to a new place. I remember spending an entire weekend going through the list of all universities. I finally settled on Simon Fraser University (SFU), and that was the best decision I could have ever made. I just had to pay the tuition fees for our institute. Additionally, I paid for the rent and other facilities (like the library and bus pass) at SFU. They do not have any scholarship program as such, so I had to bear all the expenses on my own.

How was your first experience? Your travel, stay etc.
The day I landed in Vancouver; I was welcomed with the first snow flurry of the upcoming winters. The city looked like a scene taken out of a cheesy Christmas movie with golden lightings adorning the trees along the road. I applied for the townhouses at SFU, which is shared among 4 people with all the facilities. I had to do everything from cleaning to cooking on my own. But it was fun as we would learn different cooking techniques from different cultures.

How was SFU different from IITB? What surprised you? People, infrastructure, academics etc.
Vancouver is known for its diverse ethnicity. I never felt like an outsider at SFU. I think Vancouver is the best place for semester exchange to experience different cultures. The campus was huge with so many coffeehouses that I would spend most of my day sipping Canada's most famous Tim Hortons coffee. I had the independence to choose my timetable according to my preferred slot. I was also lucky enough to get a research project under a professor. The course content was very similar to IITB, but the evaluations were not as difficult. There were groups for all courses on Discord, which made theory and assignment discussion very easy and convenient.

Can you comment on the flexibility/inflexibility you faced in academics? What problems did you face wrt to course-mapping?
To be honest, the entire process of course approval and mapping is very tedious and time-consuming. I used to find myself outside the CSE department office for almost half the semester. But all of that hard work was worth it. Managing academics was relatively easy because we just had

mid-terms and end-terms in most courses. The most challenging course found there was Numerical Analysis because it had a different approach to it. It required us to simulate and test algorithms and give a detailed report every week, along with a weekly quiz. But I got to meet a lot of new people through that course making the entire experience worth-while.

Is there anything you didn't like there?
The only thing I ever complained about there was that bus facility. The main campus is on the top of a mountain, so it takes some time to get to the city. I always had to plan before so that I wouldn't miss the last bus back up.

Did you participate in any activities there?
You name anything, and they have a club for that, starting from anime, weaving, adventure clubs to clubs solely for trying out new cuisines in different restaurants around the city. On my first day, I made friends with a lot of Singaporean exchange students (who were coincidentally from NUS xD) and thus ended up going to a lot of events conducted by the Singaporean and Malaysian club. I also went on a trip to Whistler organised by the campus residency. It is a beautiful Olympic village and a must-visit if you are in Vancouver.

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The city looked like a scene taken out of a cheesy Christmas movie with golden lightings.

How has life been for you there? Your exciting experiences of the places around.
Vancouver is so lively and vibrant and is yet so close to the serene islands and snow-capped mountains. I still miss how cheerful and helpful everyone was all the time. I tried almost everything that the place had to offer starting from hiking along the scenic trails, visiting nearby islands that had its rustic charm and even skiing. The best memory I had there was biking along the seawall in Stanley Park which circumscribed some of the city's main attractions.

Your message/comments for people who wish to apply.
Exchange is so much more than just traveling and meeting new people. It is about living alone, doing everything on your own while balancing your academics at the same time. It has made me more mature, responsible and independent. Canadians are one of the nicest people in the world, and they will help you out in any way possible. So, if you are not confident about living alone but still want to try a semester exchange, Canada is the place to apply!

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We got a chance to see a lot of festivities, ranging from the Chinese New Year to our own Holi.

You have to give the application in the IR office. The staff there is quite accommodating and helped in clarifying all the doubts. The main reason for applying for me was a need for a change of air, I guess, in the sense of wanting a new experience.

How did you choose the university for semex? What were the fee and scholarship structure?
The semester exchange application requires us to map the IITB courses to the courses to the exchange university and get the mapping approved from the department. This process takes time. Since I was late in the application process, I decided to go to the university for which most of the courses had already been mapped out by my seniors. Hence, I chose the National University of Singapore. Talking about the fees, I had to pay the hostel fees for NUS and the tuition fees for IITB, besides other expenses, including food and travel. Universities in Singapore offer a scholarship (of around 3.5 Lakhs) if you exchange in an odd semester and not in the even semester. Due to this, I had to pay the whole amount. I approximately ended up spending around 3.5-4 Lakhs (including IITB fees and everything else)

How was your first experience? Your travel, stay etc.
The experience was pretty awesome in the sense that the staff there was accommodating. As NUS has the most extensive exchange program in the world, the officials there know how to deal with all sorts of situation. I stayed on-campus and had mess facilities as well.

How was NUS different from IITB?
NUS is different in the sense that the curriculum was more comfortable than IITB (though that might not be the case with all universities). Besides that, I didn't find much difference in that way things were there.

Can you comment on flexibility/inflexibility you faced in academics? What problems did you face wrt to course-mapping?
Generally, it's tough to map all courses of a semester and get them at the exchange university because of the large number of applications and preference given to students enrolled at the exchange university. I was lucky in that sense that I got all the fourth semester courses that I wanted, but I had friends and seniors who had to do as many as 2-3 courses when they got back. Also, there was a limit on the number of courses an exchange student can take at NUS, so you can't overload yourself even if you want to. I took six theory courses + labs which is less by IITB standard.

Did you participate in any activities there?
Yes, I participated in a badminton tournament as well as a hackathon conducted at the NUS campus. Besides, there were food trips around Singapore organised for the exchange students.

Your experience with food, language, culture etc.
We didn't face much difficulty with language as most of the people in Singapore, and other students there speak English. Regarding food, it was heaven for me. I loved trying varieties of cuisines, ranging from Indonesian, Chinese, Malaysian, Western, Vietnamese and Japanese. Singaporeans have a habit of having an early dinner (6-7 PM) and having juices with every meal. Though, if you are a vegetarian, you will get fewer food options. (Contact Tarush Agrawal (2021 batch) for more info.) Singapore is quite a diverse country, and we got a chance to see a lot of festivities, ranging from the Chinese New Year to our own Holi.

How has life been for you there? Your exciting experiences of the places around.
Besides the academics, life there was mostly going around the country with friends, eating a lot and meeting new people. I also got a chance to visit Malaysia and Indonesia.



SARVESH MEHTANI

A friendly head with obsession to question the 'Why' of everything.

How did you get to know about semex?
I got initial info through some information booklet (which I initially forgot). It was later when a friend mentioned it in a casual conversation, and the idea struck my mind. That's when I got interested in the concept and dug deeper.

How did you apply for it? Why did you decide to go for a semex?

AWAY FROM KEYBOARD

A PEEK INTO THE EXTRA-CURRICULARS



KUMAR SAURAV

Simply Complex

What are you interested in?

I'm interested in reading, tennis, basketball, a few board games and hanging out with friends.

Your adventures before coming to IIT... Any competitions, prizes etc...

I was involved in crosswords, participated in quizzes and played tennis for state a few times.

How did you continue it here? What was your first experience with infrastructure and environment?

I continued playing tennis here. The experience with the tennis courts was good. There are six courts and many competitive people to play. Incidentally, there have been multiple DR-1 students associated with tennis. 2 from CSE, Anchit Gupta and Nishanth Dhikkala, the ones that I know of at least. Both the guys were part of medal-winning teams. And in my first year, there were six people from CSE in the Inter-IIT camp of 8 for lawn tennis. We excel in racket sports. There were a bunch in TT too a few years back. And badminton as well.

Did you explore new things in IIT? How was your experience during learning?

Cultural activities, mostly. Otherwise, it was related to sports, I guess. There are many different classes offered. They give you some guidance and also have a pool of students whom you can ask to help you out. Knowing people helps you in getting started with things quicker. I was involved with the Sports Council as I was the Technical Head. I learnt Photoshop and Illustrator in my first year here from seniors in a Mood Indigo session. Now I'm pretty decent at that stuff. It's quite a happening place, so it's up to you how busy you want to be. To be honest, in CSE, generally, people aren't too active outside, and I didn't want to be like that. The group you stay out with makes a difference. Unless you have a group that involves itself in outside activities, it is going to be difficult to commit yourself alone.

How much time do you get to pursue it (tennis and other activities)?

I played every day. Last semester, all I had were extra courses, and that too only 18 credits. So, I was out from 5:30 till 12 or 1 playing. Gym, tennis and basketball specifically. Otherwise, in regular semesters, I played till 9:30 most of the days. Sometimes, I managed to wrangle a treat from someone. Around 11 maybe, and stayed after that, talking. For regular semesters, I tried to work for deadlines before, so that playtime would remain intact. And once you're outside, there's no use worrying how close the deadline is. Just play, and what will happen will happen. That was what I went by.

How did you manage your time for both extra-currics and academics?

I feel people waste most of the time working about deadlines and what to do. So, I just ignored those parts and kept playing. And when I got back, I managed to pull off assignments. It was sometimes group work, so I got my job done before and let the others do their part while I was playing. However, once I forgot to submit an assignment. As long as you're not aiming for the DR and you're not too worried about what will happen with

studies, grades usually sort themselves out. There was occasional studying, though.

Did you face any problems related to it for acads (or any other issues)? Has it helped you in any way?

I relied on my group members to keep track of progress (as in when to meet for discussions) in projects because I didn't want to put my head in scheduling these things. I tried to aim for DR initially, but then people had gotten much higher grades in the first two semesters, and it would have been a lot more effort to catch up to them. DR requires effort - that's not possible with a few hasty study sessions. So, I didn't try much. Maintaining my CPI was the goal. Although, it helped with learning time management, prioritisation and compartmentalisation.

How was your experience in IITB (till now)? Hobby, competition, inter-college, prizes etc.

I didn't get anywhere competitively in inter-college level. Intra-college though won quite a few GCs. Participated in 7 sports GCs in second year and got 'Sportsman of the Year' award from the hostel. I would generally participate in 4-5 sports GCs each year. Also took part in a couple of cult/tech GCs. I appreciate the hostel culture very much, and I'm quite active on the hostel forums. I also tried to get our batch to participate in Crossy GCs, but they bailed out at least half of the time. It's a 30-40 minute thing, but most don't want to get out of their rooms.

Any message/comments for the readers.

I guess it's a matter of different priorities. For most, exercise is shallow on the ladder. Our father encouraged us to go out and play even if there was an exam the next day. I think the habit started from there. When you're playing, think only about playing. That will keep in you a better mood than fretting while playing. Have friends to talk, and people with different opinions and in different circles, so you don't get frustrated sometimes.

POORVI HEBBAR

A jolly cheerful enthusiast with mixed goals and no definite plans



What are you interested in?

I'm enthusiastic about dance and athletics. In dance, I like contemporary. I have also done Bollywood, belly and hip-hop freestyle in past one and half years. In athletics, I am mainly a long-distance runner. However, in the last inter IIT at Kharagpur, I was in the long jump event category.

Your adventures before coming to IIT... Any competitions, prizes etc...

I started dancing and running mainly after coming to insti only. Before that, I was a studious kid in the school and was not much into these. Some extra-currics I participated in school included essay writing, speeches, art competitions etc.

How did you start it here?

I was in the kho-kho NSO. I realised in the second semester that I run quite reasonably well in comparison with other girls. I was selected for kho-kho in Aavhan.

Also, I participated in most of the athletics events. After NSO, I attended summer camp of athletics, and from the third semester onwards, I was involved in athletics. I participated in the dance mania and Gyration. Then, I learnt while attending Insync jamming. Then I did AIDS, Gyration and all the other dance events which came in my way.

Did you explore new things in IIT? How was your experience during learning?

I had a lot of enthusiasm to learn new things in the first and second year. So even if I wasn't that good at sports or dance, in the beginning, I realised that I'm not as bad as I expected I would be without any beforehand experience. So, I guess that was kind of motivation, and I used it to inspire myself. Everyone is friendly, and it serves as motivation to join them in such stuff.

How much time do you get to pursue it?

Athletics practices are pretty regular, every day around 1-1.5 hours in the evening. Dance is not throughout the year, it's just for some events like AIDS or Gyration, so I guess, it mainly takes 1-2 weeks before the thing. I skipped practices only if there were any exams or assignment deadlines that I couldn't complete before.

How did you manage your time for both extra-currics and academics?

Managing time is not that big a deal, to be honest. People spend hours just texting, scrolling social media feed, playing clash royale or watching something on YouTube. I spend an hour or two for athletics and dance and a little less time for such stuff compared to other guys. And when it comes to acads, it's cool because I guess I attend most of the classes (at least I try to) and we have loads of time to study or do assignments. 1.5 hours a day doesn't matter much, and athletics puts me into the discipline, and the schedule revolves around it.

Did you face any problems related to it for acads (or any other issues)? Has it helped you in any way?

Sometimes I faced problems. I don't like missing practices until and unless it's necessary. So maybe I had to complete my assignment a bit faster and had to hurry at the end moment. But that's cool I guess, started prioritising acads much more in the sixth semester. I would say it has helped me a lot, mainly in keeping the stuff in the schedule. Labs or classes get over by 5:30-6. Instead of going to my room, I used to head to the library or the H10 common room because I have to reach the ground (or gym) by 7. After practice, I usually had dinner, and then I used to study. And I feel active throughout the night, and it helped me sleep perfectly, as I was generally tired.

How was your experience in IITB (till now)? Hobby, competition, inter-college, prizes etc.

Great awesome! Could not ask for more. It helped me explore so much. I love dancing and running. And I am getting a lot of that in insti. I didn't participate in competitions much, and I like practices more I would say. Inter IIT experience at KGP was excellent. Didn't get any prizes there but still, that experience was worth my winters. I have won many awards at the insti level - Athletics GC, Crossy GCs and different runathons, relays, biathlons etc. I got the first position in this year's Gyration. Rest all dance events are mostly not competitions.

Any message/comments for the readers.

Have fun and enjoy your life at IITB to the fullest, although prioritising your acads over others. Because I guess all of us are going to miss this later.

People spend hours just texting, scrolling social media feed, playing clash royale or watching something on YouTube. I spend an hour or two for athletics and dance.



TATHAGAT VERMA

A simple guy who gets bored real quick

What are you interested in?

In extracurriculars, I have been highly interested in swimming and football.

Your adventures before coming to IIT... Any competitions, prizes etc...

In the school days, I would participate actively in swimming and football competitions. However, I didn't pursue them from 10th through 12th due to JEE preparations. After JEE, during the two month holidays, I resumed swimming with full intensity. I have been staying in Powai throughout my school time and my swimming coach, Dr P M Reddy, had been the coach at IIT as well. So, he suggested that I should start training for Inter IIT right away. That was how I started putting in the work. The practices used to be from 5-7:30 in the morning. Apart from that, I used to do workouts at home by myself in the evening for an hour. I improved a lot during that period.

How did you continue it here?

Once the semester started, I would continue with the practices daily. These practices in the evenings continued until Inter IIT aquatics which was about a week after the midsems. Our coach gave us a break for the midsems. So, in the first half of my first semester, my entire time apart from academics would be spent in swimming.

How much time do you get to pursue swimming?

I continued the practice for Inter IIT from 5:30-8 in the evening. After Inter IIT, I kept going for the practices but with a lower frequency.

Did you face any problems related to it for acads (or any other issues)? Has it helped you in any way?

I remember well that the intense workouts would have left me so tired that I would often doze off in the lectures (actually I enjoyed that xD). The best thing was that I would have so little energy left that I would decide to spend that bit in academics rather than in enjoying the recently gained freedom one gets in college, and hence it prevented me from being unproductive. Also, it turned out that first semester studies could be done well with not so much effort. So, in that way, swimming helped me in academics. Apart from academics, I met quite a few seniors through aquatics, and that again proved to be a boon for getting guidance in general.

I would have so little energy left that I would decide to spend that bit in academics rather than in enjoying the recently gained freedom one gets in college.

How was your experience in IITB (till now)? Hobby, competition, inter-college, prizes etc.

The Inter IIT aquatics meet had been a great experience. It gave an exposure to the effort people from all IITs had been putting in for the sport. It also helped in getting to know many people from other IITs. Apart from aquatics, I took part in the Inter IIT Technical Meet 2019 at IIT Roorkee. I had applied to get in the contingent in my first year too, 2018, but didn't get selected then. In my sophomore year, 2019, I got in the Route Optimization Algorithm competition mainly due to my CSE background. Rupesh and Chaithanya guided us, and Prathamesh More (from Aerospace department) and I worked on the code. The entire experience was remarkable. I thoroughly enjoyed it, all the unpredictability, all the night outs and all the chats. I certainly enjoyed running after trains and then missing them xD. Also, it made it so much more like a trip with everything being so spontaneous. All of us interacted very well among ourselves and made it very entertaining. Also,

FAST-TRACKING

Vamsi Krishna Reddy

Can you tell readers what fast-track is?

Fast-Tracking is a provision given by the institute for undergraduates (I'm not aware of PG students) to complete their course-work early to leave the institute early. The course-work, i.e. the required credits can be finished as soon as within six semesters. I finished mine in 7 semesters, thus giving me a semester off to give me some time for my own.

How did you get to know about fast-track? Did any of your friends do it earlier?

The UG Academic Council released the sophie booklet when I became a sophomore. Though I did not have any specific plans to fast-track immediately then, I was aware of the provision to do so. I was not aware of anyone doing this from my senior batch. Eventually, after I decided to fast-track, I got to know that a few seniors from the department had done this earlier. Since the rules and procedure were a bit unclear, I talked to Rishabh Aggarwal, who is from the 2014 joining batch. He did fast-track like me in the 7 semesters then.

What made you think that you should do a fast-track?

I have already been doing several CS electives every semester, similar to some of my peers. Since I was particularly interested in CS courses only, I took a few advanced courses of my interest like AML, Computer Vision in my sixth semester itself. Sometime, around the end of the sixth semester, I felt that I am interested in the field of AI, and felt there were not many specific courses I was willing to take later in the eighth semester. It wasn't an immediate decision, but I felt it was better for me to fast-track so that I could personally learn something on my own. I could spend some more time with my family before leaving the country soon. Also, I had a not-so-particular interest in any of the other advanced courses, plus being a little bit bored of the constant academic lifecycle filled with deadlines and exams in the institute made me take the decision. Leaving the institute and my friends were the most challenging decisions to make against doing the fast-track.

What procedure did you follow for it?

Glad you asked. Though there is nothing fancy, it was not-explicit anywhere. First, the approval of the FacAd is necessary for your decision to fast-track. It is a good idea just to talk to your FacAd first once you've decided to fast-track. After your exams are done, and grades are given out, the formal procedure starts, since you need to complete the requirements of the degree. The student application form needs to be filled to apply for fast-tracking. It should be signed by FacAd and then submitted to the department office. Also, any final course re-tagging that must be done should be mentioned here in the application details section of the form. Finally, the department office will ensure that it is sent to

the academic office for further action. Note that the form must go to academic office only through the department office. It may take a few weeks to be approved, and you might want to follow up with the academic office thereon. Once it is approved you will be asked to sign a no-objection/no-dues form from almost everywhere like the library, gymkhana, hostel, etc. to ensure you are free of any dues. Alumni form and convocation form also need to be filled at the same time. Once that's done, depending on the pace of things, you will be given a provisional degree. This provisional degree is different from the actual degree, and it is a simple letter with IITB letter-head stating that the requirements of the degree have been completed and the degree will be given on the Convocation date. It is my advice to also apply for a transcript too. At this point, no more change to your academic profile can be made obviously, i.e. the courses, its tags, your CPI and whether you have Honor or Minor is all determined by the credits completed. For fast-tracking students, re-tagging can be done before they leave, i.e. through the application. If anyone is fast-tracking, they need not pay the semester's fee for which they skip, as told to me by the academic office.

How did you manage to complete the curriculum early? Did you face any problems?

I don't have much to say over this. I know some who take like two electives every sem on an average, but not all. I was pretty comfortable doing that. I mean given the core curriculum, the two additional courses didn't make a lot of difference to me in terms of load, though that may be just my opinion. I advise students to make sure they don't burden themselves with excessive course-work since it is the learning that matters.

Is there a way to get back?

I have not enquired about this, but I guess the answer is no. Once, your application is approved and the provisional degree is given, I think it is irreversible.

Any message/comments for the readers...

I'd suggest students analyse their plans, goals and opportunities and all the trade-offs before deciding to fast-track. It is not like it is the best path to choose always. However, there are potential opportunities to utilise the time after fast-tracking by exploring your hobbies like travel or taking up a serious long-term internship (unlike the summer internships where time is a barrier), or anything you might have thought of doing but could never find some time to do so. Overall, I would say the IITB is only one of the few institutes in India to give this opportunity, so do utilise it if it fits your plans.

I didn't interact much with people from other IITs there, but I got to know many people of insti to a great extent, and that is irreplaceable. At times during the preparations, I would sometimes feel like giving up, but finally, all the efforts paid off and much more than what I had put in. And we won the gold!! I think that more people should get involved in these competitions and we should encourage taking part in more and more events.

Any message/comments for the readers.

Being part of the aquatics team for two years has now led to developing a great bonding and friendships in the

group. It has also helped in interacting with and getting to know many alumni. Through my experience in sports, I have found that doing something apart from academics during the semester helps in staying engaged and active. Hence, one remains more productive as the extracurricular becomes the source of refreshment rather than just whiling away time. I think one must decide what extra to do in a semester beforehand and then pursue it with all dedication.

bitStream Team



Hey there,

Hope this note finds you happy and sound in these extraordinary times. With this online newsletter, we are hoping to revive bitStream, our department newsletter. In the short piece, we have tried to include subjects which will hopefully give readers more insights into the functioning of our CSE department, while at the same time bringing some issues to the fore.

With this 2020 edition, we have included an extensive interview with our HOD, student experiences of extra-curricular and semester exchange, and a piece on unconventional career choices from the alumni of the branch, which is highly known for core placements. We have also tried to present a comprehensive and lucid representation of the sub-areas in the Computer Science department and the faculties associated with them. Hope you have a good read.

Thanks to the team for putting up efforts despite the online aspect. The department wishes to regularly release such newsletters in the future covering issues that matter. If you have some topic that you would like to be covered, feel free to contact us. And if you have a passion for writing and journalism, keep in touch with the team for future opportunities.

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