

# An Evening with Prof.

## Manas Thakur



BY AMEYA DESHMUKH

**Can you explain your current research in compilers + programming languages, to a CS undergrad who hasn't had much exposure to them yet?**



Heap allocation is expensive. You have objects with levels of indirections through pointers for field accesses. In managed languages like Java, you also have a garbage collector running in parallel to reclaim unreachable memory. What we are trying to do, as a multi-year project with IBM, is optimizing memory allocation on the heap by trying to move as many objects as possible on the stack. The good thing about the stack is that once the lifetime of a function is over, you can simply reclaim the associated objects.

In particular, we are trying to do this for languages with dynamism eg. languages that allow changes in the code during execution. Here, we also need to efficiently undo whatever compiler optimizations we have done which are no longer sound. The good thing is that we are implementing all of this in a real world Java VM, and we already have pull requests that have been accepted. This allows our work to be used by anyone to speed up their programs!

**When did you know that academia was your calling? What was your motivation to pursue a PhD, and what did you gain from the process?**



My grandfather was a retired teacher, and my house always used to have books all over. I liked to be in such a setting. Moreover I am an only child, so I had a very disciplined upbringing with lots of motivation to be the conventionally 'good' student. In turn, I developed a longing to become a person like my teachers.

PhD is a very rigorous journey that prepares you to face almost anything in life: rejections, pressure, managing relationships. In retrospect, it doesn't look as tough, but when you are in the process it is completely different. In those years, you are in an environment which is guided, and yet you are free. This allows you to look within and develop strong convictions and philosophies of your own.

**Did you consider career trajectories other than academia?**



I did, but everything that excited me always involved academia in some flavor. I was offered jobs at industry out of college, with one offering guest lectureships as and when possible. At one point, I considered doing a course in Yoga, and I loved the idea because that would allow me to teach Yoga. Some people felt that being a disciplined child with his heart in the right place, I was fit for the administrative services. That idea itself didn't excite me, but that of affecting people's life for the better stuck with me. Academia allows me to do so, albeit at a slower pace over multiple generations.

**We see that you have multiple collaborators from abroad, but you seem to have done all your study in India. Didn't you consider a postdoc abroad, and how do you compare doing research in India versus the top institutes outside?**



I had postdoc offers from the US, Australia coming out of PhD, but I wanted to stay close to my mother so I opted to go to IIT Mandi. Choosing where to do your Masters, PhD, postdoc requires a lot of homework. The most important factor to consider is the quality of the research output of the particular group, and whether they are trying to push to the top conferences, journals in the field. Location, rank of the university is subsumed by this.

In my case, I chose to stay for a personal reason, but ended up working with two brilliant groups from abroad while at IIT Mandi, with my students. As good as doing two postdocs in three years without going anywhere!



**How does the excitement, nervousness, and amount of preparation required compare between the first few courses you taught at IIT Mandi and courses you teach here?**



Preparation is always needed if you are serious about offering a course, no matter what. Giving various talks at colleges, industry events, workshops etc. as a PhD student had given me some experience, and gotten rid of my stage fear. But planning a semester-long course is an entirely different ball game, and requires very far-sighted vision. My first course was a UG compilers course. The planning for the first few lectures itself took me around two months, and I received positive feedback quite early on!

My second course was Paradigms of Programming (PoP). Two of the most acclaimed offerings of this course then were the one at MIT, and the one here at IITB taught by Prof. Amitabha Sanyal. So I got in touch with the instructors to understand their perspectives. Additionally, I was supposed to teach 6th semester students, while these courses were built for 1st year undergraduates, so I also had to align the content appropriately.

Not much has changed in these aspects for me, except for the increase in the class strength here. It has its advantages in the increased number of interesting questions and perspectives, but at the same time the logistics, evaluations become all the more tedious.

**Core courses vs Electives. How are they different from your perspective? Do you enjoy any one more?**



In a core course, you need to uncover a fundamental body of knowledge, while in an elective you want to discover new stuff, excite the students, maybe get some research leads out of them. A core course allows me to hone my teaching skills, and I enjoy when students are mesmerized by the level of preparation that goes into explaining the concepts lucidly. I aim to do so with Interpreter design in the next PoP offering. In an elective you can improvise more, go in with no slides, encourage the students to challenge the state-of-the-art on each topic, etc.

**You travel a lot. What are some of your most memorable travel experiences?**



I've had some crazy experiences with Flights and Food. I have caught an international flight almost just before take-off in a full sprinting-in-the-airport fashion, like in the movies. I have had my VISA application sent back, and subsequently received it in 15 minutes after standing outside the embassy for hours with out-of-the-box help from a professor. Once in Prague, I went out to an Indian restaurant with my colleagues and by the end of the meal I was the only person not in tears!

A memorable aspect of any trip is also the new acquaintances you end up making. I am still in touch with people from a tour I took during my solo trip to London!

**What are the qualities that you have picked up from your PhD advisor? What are some things you expect from a good PhD student?**



When you join for a PhD one of the first things you are told is not to look for a friend, philosopher, and guide all in one human. But my advisor was all 3 and even more. He made sure that we did quality work while I gained independence as a research scholar. Because of the treatment I got from him I think of all my PhD students as my family.

Not being isolated, and not putting myself up on a pedestal are things I have learned from my advisor. You have to show your human side to your students in order to have meaningful conversations, and build a bond with them. You would find many occasions when they look up to you and instances where you can indeed make a life-time difference. From a student I expect sincerity, respect for time, honesty, and not trying to be more or less than what you are; even as a mentor I try to do the same.

**Are you in touch with pop-culture?**



There is a reason why some of my assignments are Harry Potter or GoT themed! I enjoy such high-fantasy series as well as feel good movies such as 'The Pursuit of Happyness', 'A Man called Otto', 'The Intern', etc.

**What are your hobbies and how do you find time for them?**



In Chennai I became spoiled with all city-stuff. I enjoyed regular outings, movies etc. Mandi was a big change, no malls, no theaters, sometimes no food delivery. Living there made me realize that all of it wasn't something I enjoyed as much as I thought.

Now, I enjoy peaceful places in the campus, listening to the waves at Mumbai's beaches, sitting with a book, playing indoor games such as Ludo at home, exploring new cuisines. I also try to find joy in small things that don't take up too much of my time; take for instance this plant I have in my office. Everytime I see a new leaf grow on it I get very excited!

**When did you start doing Yoga? Do you still regularly practice it?**



During my PhD, I gained a lot of weight being a couch-potato! I decided to join an evening Yoga class for my health, around 2016, and it has stuck with me since then. I love that there is no 'wrong' way to do Yoga, and also how convenient it is. It is physically refreshing as well as mentally peaceful for me. When I stood on my head for the first time after 1.5 years of thinking it to be impossible for my body – I knew a human can do much more than usual, with persistent effort.



./closing\_remarks

THE HIGHEST NUMBER OF TURING AWARDS TILL DATE HAVE BEEN WON BY RESEARCHERS WHO HAVE CONTRIBUTED SIGNIFICANTLY TO PROGRAMMING LANGUAGES. THIS REQUIRES A LOT OF QUALITY WORK.  
THE FIRST PERSON TO WIN A TURING AWARD, ALAN PERLIS, OPINED THAT AS COMPUTER SCIENTISTS AND ENGINEERS WE SHOULD ENSURE WE KEEP FUN IN COMPUTING; ONE SHOULD BE ABLE TO MAINTAIN THE JOY THEY GOT ON FIRST BEING LED TO THIS MACHINE,  
THE FEELING THAT THEY CAN MAKE IT MORE.  
MY GOAL IS TO FACILITATE BOTH TOGETHER: QUALITY OF RESEARCH AND TEACHING WHILE MAKING SURE WE ENJOY THE PROCESS. OF COURSE, AT THE END OF THE DAY, THE WORLD IS CIRCULAR:  
"YOU POUR LOVE, YOU GET LOVE."