Mathematician at heart

Rajeev Motwani is eagerly waiting for the Google IPO

Rajeev Motwani has done it all. A Godel Prize winner, one of the most prestigious awards in theoretical computer science, one of the youngest professors at Stanford. Author of several papers in esoteric subjects like randomised algorithms and data streaming, Motwani is now eagerly waiting. No, not about another award or a theoretical conference, but for the Google IPO. As a former technical advisor to Google and a mentor to the founders in their student days at Stanford, where the search engine took shape, Motwani owns an undisclosed amount of stock in Google.

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Motwani's father was in the Indian Army which meant growing up all over India. Young Motwani wanted to be a mathematician, like Gauss. "This was partly shaped by the books I had at home. My parents for some reason had a lot of these books – 10 great scientists or five famous mathematicians – their life story and so on. As a child, whatever heroes you read about you want to become," adds he.

After St. Columbus in Delhi, Motwani joined IIT Kanpur, which at that time had just started the undergraduate programme in computer science. "I truly wanted to be a mathematician, and my parents were hesitant because how do you make money as a mathematician, how do you support a family, what is this all about.

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"I was basically forced into going into computer science even though I did not want to, but it turned out to my wonderful surprise that computer science is actually quite mathematical as a field. One of the shaping influences was actually Kesav Nori – he was there for a while and, in fact, IIT Kanpur at that time had a outstanding computer science department. It was an amazing confluence of people and personalities.

"Again Berkeley was a very positive influence, very politically oriented, it's like the JNU of the US. I was so thoroughly enjoying the new environment I was in. My advisor, Richard Karp, was a Turing Award winner, which is sort of like the Nobel Prize in computer science. At that point it occurred to me that I am letting down this great man, not producing anything and the last two years I was tremendously productive."

Motwani has worked in many different areas in Stanford, like robotics and drug design. "I credit Stanford for creating an environment where people in different areas can work with each other and do things where the whole is greater than the sum of the parts," he says.

"Meanwhile the World Wide Web was coming around at that time and I just got sucked into that. Sergey Brin and Larry Page were running a search engine out of Stanford. These 21-year-olds would come in and make demands on me – we need more disk space because we are crawling the Web and its getting bigger, we need to buy more disk... I'd give them more money and they'd go buy more disks. At some point these guys said, we want to go do a company. Everybody said you must be out of your minds. There are like 37 search engines out there and what are you guys going to do? And how are you going to raise money, how will you build a company, and these two guys said, we'll just do it and they went off and did it. And there are some big names who supported the company in its early stages. And then they took over the world. And right now, you know, other search engines do not even compare. It is just amazing. Just feels like a part of a little bit of history and I contributed a little bit to that history. Now I have become a start-up junkie."

How does Google's technology work? He explains, "Let us say that you wanted information on 'bread yeast' and put those two words in Google. Then it not only sees which documents have these as words mentioned but also whether these documents are linked to other documents. An important page for 'bread yeast' must be having all other pages on the Web dealing in any way with 'bread yeast' also linking to it. In our example there may be a Bakers' Association of America, which is hyper-linked by most documents containing 'bread yeast', then it implies that most people involved with 'bread' and 'yeast' think that the Bakers Association's Web site is an important source of information. So Google will rate that Web site very high and put it on top of its list. Irrelevant documents which just mention 'bread' and 'yeast' will not be given any priority in the results.

"By the way, you might have noticed that the job of the search engine is nothing more than what a humble Librarian does all the time and more intelligently! However, the automation in the software comes to our rescue in coping with the exponential rise in information."

◆ SHIVANAND KANAVI