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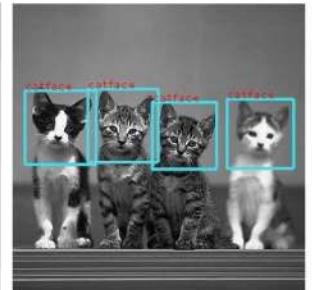


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FOREWORD

"Simplicity is the ultimate sophistication."

-Leonardo da Vinci

It gives me immense pleasure to see that the Editorial Board of the Department has come up with the fourth edition of the magazine, *BufferedReader*. *BufferedReader* has provided an all new identity to the Department, with the magazine being immensely appreciated throughout the campus. With the changing energy levels of the students, the magazine has gone through a number of fits and starts. Now is the time for the fresh and charismatic souls of 2017 batch to take it to the next level. Efforts like publication of magazine are extremely valuable in enhancing, developing and honing the editorial skills amongst the literary minded students, in addition to playing the role of a mirror to the past and the possible future that holds great importance to them.

Our aim in every edition is to reclaim a little more land, to add something to the extent and solidity of our posessions, featuring amongst the best departments of the institute. Our main aim is to make the students analyze the narrow gap between being intelligent and being intellectual. The Department eyes on all round development of students and tries to ensure intellectual, ethical and social development. The magazine provides an insight to the departmental news and also about the recent advancements in the IT sector.

This time, our magazine has a theme – *Minimalism*. Minimalism is an art form that characterizes simplicity. Simplicity is nature's first step, and the last of art. It is through simplicity, I believe, that we achieve greatness. And maybe, that is what this edition is all about – an effort to achieve perfection through simplicity.

The magazine's primary human resource are my students, in the conceptualization, content development, production and distribution of the magazine. On the other hand, the flawless contribution of the faculty members cannot be neglected. It would be my pleasure to convey gratitude to all my colleagues and students for their immense contribution in the successful compilation of the 4th edition of *BufferedReader*.

I appreciate honest and frank feedback on the quality and contents of the magazine so that we can improve. Do write to me at cse@ismdhanbad.ac.in .

Happy Reading! •



Dr. Chiranjeev Kumar
Head of Department

EDITORIAL

adopts a multi-state, bit superposition approach for the purpose of extremely efficient data computation.

We are also grateful to Dr. Haider Banksa for giving us a remarkable insight into nature inspired paradigms that are currently trending in the world of computation. The article tells us how solutions to even the most complex computational problems could be found if we dig deeper into exploring nature's ways of adaptability and problem solving.

Apart from the ritualistic highlights of the Annual Day and Concerto, every edition of *BufferedReader* has a separate column for the alumni that enlightens us all with their life and professional experiences. This time we are thankful to Mr. Dilip Kumar of 2006 batch and Mr. Rahul Paul of 2015 batch for contributing to this section, and honouring us all with their kind words of wisdom. We also appreciate the efforts of the contributors who decided to share with us their thoughts, arts and writings.

The magazine that you are currently holding in your hand is the culmination of the effort, determination, perseverance, and endless dedication of our team. Our never ending sessions and the long hours put in by every member of this team have helped to present to you the same old magazine, but with a brand new face. Presenting *BufferedReader*, the fourth of its kind. Our team extends gratitude to the readers for making efforts of thoroughly going through every bit and piece of information this magazine has to offer. This magazine is not only an outcome of the role played by the current team, but also owes an enormous debt to the previous contributors without whose help the fourth edition would not have been able to see the light of the day.

The current edition focuses on a topic that is widely expected to revolutionize the way computers are created. "Quantum Computing" is currently the talk of the town, and we at *BufferedReader* have brought you a deep insight into the topic and also the future aspects of this technology. As Niels Bohr once wisely stated, "If quantum theory hasn't profoundly shocked you, you haven't understood it yet." It is indeed intriguing to realise how quantum theory

Judging from the drastic advances in the world of innovation, it can be rightly stated that now is the best time to be passionate about technology, and we at *BufferedReader* want to share this passion with our fellow readers. Two years ago in this very department, a wheel was set to motion by our beloved seniors. And despite the rugged, endless road we know by the name of 'time', the wheel is spinning at its full pace. Now, more than ever; we strive to never let it cease.

So hold on to your seat belts readers, and brace yourselves for the roller-coaster reading ride. May the curtains rise, and the drum beats begin.

Happy Reading! •

Parichaya Walia, B.Tech 2017
Pranav Thombre, Dual 2019

QUANTUM COMPUTING

Ashish Verma | B. Tech 2018

Pranav Thombre | B. Tech 2018

Vaasudev Narayanan | B. Tech 2018



Since time immemorial (the digital timeline that is, which roughly takes us to the 1970s), our hunger for computing power has been insatiable. Every 24 months, we double the number of transistors we can elegantly cram up in a relatively infinitesimal space in the order of micrometers.

The day George Boole gave us the simple yet beautiful idea of how we could control, manipulate and basically make the tiny atomic particles, a.k.a. electrons our slaves; the binary number system that is, he radically transformed the rate at which humanity was going to progress. In the blink of an eye, we had the first transistors, evolving to logic gates, to integrated circuits and finally to the microprocessor.

It's funny how something so pleasingly ingenious can be this straightforward. Just to illustrate the true elegance of

Zero: consider a string of infinite length consisting a non-repeating sequence of only 0's and 1's. Converting this string to ASCII text gives us some really magnificent results. Somewhere in that infinite string of digits is the name of every person you will ever love, the date, time, and manner of your death, and the answers to all the great questions of the universe. The results are even more dramatic when that sequence is converted into bitmap. Somewhere in that infinite string of digits is a pixel-perfect representation of the first thing you saw on earth, the last thing you ever see before your life leaves you, and all the moments, momentous and mundane, that will occur between those two points. All information that has ever existed or will ever exist; the DNA of every being in the universe, all of it can be represented by two symbols - logic 0 and logic 1, low and high, Zero and One.

How long can we continue to tread along this path though? How many years do

we have before we hit a solid dead end at the atomic scale, where we can no longer jam any more transistors? Should we start our quest for a new road or should we build one ourselves?

This edition, *BufferedReader* explores the inherently strange and amazing world of quantum computing.

Quantum, the word carries an aura of strangeness, mystery and has an enigmatic feel attached to it. At first glance, it really is safe to say, incomprehensible. The concepts of superposition, tunneling and entanglement are inconsistent with our normal world and may seem peculiar to our common sense. But breaking down and observing its infinite scope of applications, it really doesn't seem so complicated.

Before we delve into the depths of how the quantum world operates, it would be prudent to first have a look at the need of

such a complicated mechanism.

The tech world always harps on its yearning for quicker processing computers which unleash their capability to produce machines and intelligence as smart as Iron Man's JARVIS. Quantum Computing has proved to be a boon for them.

We continue to crave for higher computing speed. As a result, the circuits in the micro-processors are diminishing, and by the year 2030, we will find them measurable on an atomic scale. This gives us a clear direction. It points to taking the next logical leap, the idea of Quantum Computing, which will harness the power of atoms and molecules to perform memory and processing tasks.

The immense amount of processing power generated by the computer manufacturers has not yet been able to quench our thirst for speed and computing ca-

pacity. In 1947, an American computer engineer made an errant prediction that just six electronic digital computers would assuage the computing requirements of the United States. Of course, then he didn't count on the large amounts of data generated by scientific research, the proliferation of personal computers or the emergence of the Internet. Over the passage of time, these technological advancements have fuelled our need for more, more and more computing power.

The revolutionary concept of Quantum Computing was first theorized less than 30 years ago, by a physicist at the Argonne National Laboratory. Paul Benioff is credited with first applying quantum theory to computers in 1980. Benioff theorized about creating a quantum Turing machine.

The Classical Turing machine, developed by Alan Turing in the 1930s, is a theo-

retical device that consists of a tape of unlimited length that is divided into little squares. Each square can either hold a symbol (1 or 0) or be left blank. A read-write device reads these symbols and blanks, which gives the machine its instructions to perform a certain program. The Turing machine formed the mainstay of the modern Digital Electronics which laid the foundation of the classical computers.

Owing to the fact that Quantum Computers have the potential to perform exhaustive calculations significantly faster than any silicon-based computer, technocrats have already built basic quantum computers that can perform certain calculations. A practical Quantum Computer is not too far.

Let's have a look at the building blocks of quantum world.

Defining Quantum: Qubits



The very groundwork of quantum mechanics is based on the principle of Superposition. The renowned theory about Schrödinger's Cat is an excellent example to understand superposition. Let a cat be closed in a box with a device that would release toxic fumes upon activation at any instant of time. Now since it is quite uncertain when the device is activated; it is equally uncertain to say whether the cat is alive. This lead Schrödinger to put forward the superposition theory and state that cat is both alive AND dead and it is impossible to know its exact state unless the box is opened.

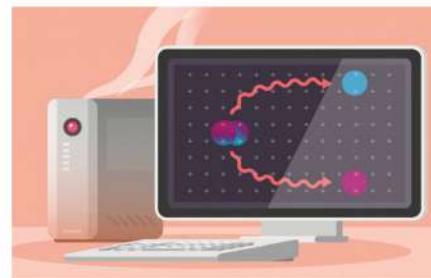
This principle if extended to computing, gives the nascent concept of qubits. Like bits in the classical world, qubits are the simplest possible units of information in the quantum world. They are oracle-like objects that, when asked a question (i.e.,

when measured), can respond in one of only two ways. Measuring a bit, either classical or quantum, will result in one of two possible outcomes. It may sound, at first, that there is hardly any alteration between them. But this is how the Quantum nature comes into role. The difference is not in the possible answers, but in the possible questions. For normal bits, only a single measurement is permitted, implying that only a single question can be asked: Is this bit a zero or a one? In contrast, a qubit is a system which can be asked many, many different questions, but to each question, only one of two answers can be given. This bizarre behavior is the very essence of quantum mechanics which drives the swift processing of Quantum Computers.

In a Quantum Turing machine, the difference is that the tape exists in a quan-

tum state, as does the read-write head. This means that the symbols on the tape can be either 0 or 1 or a superposition of 0 and 1; or we may say the symbols are both 0 and 1 (and all points in between) at the same time. While the Classical Turing machine can only perform one calculation at a time, the Quantum Turing machine can perform many calculations at once.

Today's computers work by manipulating bits that exist in one of two states: a 0 or a 1. Quantum computers aren't limited to just two states; they encode information as qubits, which can exist in superposition. Qubits represent atoms, ions, photons or electrons and their respective control devices that are working together to act as a computer memory and a processor. Because a quantum computer can contain these multiple states simultane-



ously, it has the potential to be millions of times more powerful than today's most powerful supercomputers. Now isn't that amazing?

This superposition of qubits is what imparts Quantum Computers their inherent simultaneity. According to physicist David Deutsch, this parallelism allows a quantum computer to work on uncountable computations at once, while the desktop PC works on one. A 30-qubit Quantum Computer would suffice the processing power of a conventional computer that could run at 10 teraflops (trillions of floating-point operations per second). Today's typical desktop computers run at speeds measured in gigaflops.

Having multiple states is fine, but how do we extract the exact state from a qubit? How do we measure and process the information? In classical bits we could simply read the data of a bit without

manipulating it. But the same cannot be done with qubits. According to a law in Quantum Mechanics, 'Measuring a qubit changes its value to match the result of the measurement.' This entails that if we attempt to measure a qubit, we may not get the value it possesses but the value it absorbs due to disturbance caused by measurement. So the next time, if we measure the same qubit we may get some different value, any random reading. This synchronizes with another law in Quantum Mechanics which states, 'Qubit measurement gives random results.'

This ascends a problem with the idea of Quantum Computing. If we try to look at the subatomic particles, we could bump them, and thereby change their value. If you look at a qubit in superposition to determine its value, the qubit will assume the value of either 0 or 1, but not both (effectively turning your spiffy quantum computer into a mundane digital com-

puter). So how could we possibly assure the quantum nature to work and make use of it simultaneously? To make a practical quantum computer, ways of making measurements indirectly to preserve the system's integrity are devised. Entanglement provides a potential answer.

In quantum physics, if we apply an outside force to two atoms, it can cause them to become entangled and the second atom can take on the properties of the first atom. So if left alone, an atom will spin in all directions. The instant it is disturbed it chooses one spin, or one value; and at the same time, the second entangled atom will choose an opposite spin, or value. This countenances us to know the value of the qubits without actually looking at them. So we have an avant-garde idea of Quantum Computing giving us a mighty strength to commit any computing task which we couldn't do earlier due to memory and speed limits.

Applications

Computers built on the principles of quantum physics—as opposed to ‘classical’ physics—promise a revolution on the order of the invention of the computer or the television. D-Wave, a small Canadian company backed by Jeff Bezos, NASA, and the CIA among others, is the first firm to sell a so-called quantum computer—at roughly \$10 million for a unit. The vast increase in power could revolutionize fields as myriad as medicine, space exploration, and artificial intelligence. The uses of quantum computing are vast and consist mainly of the following.

Reduce weather-related deaths

Quantum computing will enable meteorological scientists to detect storms well before their arrival. This will allow people to show better preparedness towards natural disasters, and would also help reduce the damage in the aftermath of a disaster.



Safer airplanes

Lockheed Martin plans to use its D-Wave to test jet software that is currently too complex for classical computers. Quantum computers would permit us to carry out simulations that are too complex to be carried out on normal computers. This would result in the development of aircrafts that are more accident resistant, enabling safe flying.



Discover distant planets

Quantum computers will be able to analyze the vast amount of data collected by telescopes and seek out Earth-like planets. The extremely large processing capability of quantum computers would allow us to process data faster than before, heralding a new age in space exploration.



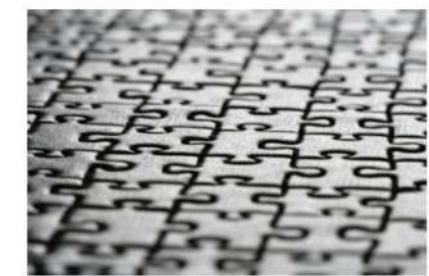
Detect cancer earlier

Computational models will help determine how diseases develop. Quantum computers would help to track the progress of a disease much better than that of their “normal” counterparts. This would help in the early detection of cancer and also a better survival rate. The advent of quantum computers would also make it easier to check the spread of diseases across the world, and would help to isolate the contagion to a particular area.



Help automobiles drive themselves

Google is using a quantum computer to design software that can distinguish cars from landmarks. The incredible speed of quantum computers allowed the real time processing of traffic data, which enabled the existence of the self-driving car.



Communication encryption

It's possible to make encryption even more secure by using the same weird quantum mechanics property that makes a quantum computer work. This ultra-secure communication is called quantum key distribution and it allows someone to send a message to someone else that only they can read by using a key to decipher it. If a third party intercepts the key then, it becomes useless and no one can read the message.



Develop more effective drugs

By mapping amino acids, for example, or analyzing DNA-sequencing data, doctors will discover and design superior drug-based treatments.

Applying the unusual and seemingly bizarre concepts of quantum mechanics to computing is not only ingenious but also an exemplification of the brilliance of the human mind. A quantum computer taps directly into the fundamental fabric of reality – the strange and counterintuitive world of quantum mechanics. Quantum mechanics underlies many of today's most important technologies, including lasers and semiconductors found in every computer chip.

Mathematics and theoretical physics are generally eighty to hundred years ahead of technology. Sixty years had to pass before we could see the first applications of fuzzy logic. Prime numbers have fascinated mathematicians since centuries; yet it was only in the 1970's that the RSA encryption algorithm was published and became a commercial reality much later. The quantum world was introduced to us in the early 1900's. It isn't tough for the logical mind to see that to see quantum computing achieve its full potential, We need to have some patience and let it metamorphose from its presently unknown form instead of rushing it and unnecessarily exposing the flaws of this wonderful technology like solar and nuclear power. Every technology has its problems; hardly ever is it a complete package. The least we can do is minimize the flaws and maximize its already infinite scope by letting it evolve and, of course, hope for the force to be with it!

IN CONVERSATION WITH

DILIP KUMAR

ParichayaWalia | B.Tech 2017
Shantanu Mishra | B.Tech 2017



Dilip Kumar

It's been 10 years since he had been associated with ISM Dhanbad, but Dilip Kumar, now a Software Engineer at American Express leaves no chance elude where he can contribute for the department, making an appearance even on Annual Day through a video call to stay connected with the current batches. BufferedReader caught up with the 2006 batch Alumni where he shares his views on how to reinvent the way we think of innovations.

Technology is the wheel that has been driving the progress of human kind all these years. Given the pace with which the wheel keeps moving, every generation finds it difficult to catch up with what it may find, say a decade ahead of them. However, being Computer Science graduates and undergraduates of this generation, there are high expectations from all of us to not just master all these technologies, but also to bear the brunt of keeping the wheel going. Knowledge and awareness of technologies are the only means we can survive in the world that waits for none. To ensure that everything goes as planned, the following few steps might help!

- Trying to predict
- Reinventing the wheel
- Building your own product
- Collaborating and sharing
- Learning more about Internet technologies
- Keeping a positive attitude towards Computer Science & Engineering.

Predicting about any technology or a solution is a crucial step. If someone decides to learn about a new technology, they must figure out what problem it is attempting to solve, along with all the required characteristics of that problem- be it its nature, background, shortcomings, or key target areas. We need to first of all devote time in analysing and coming up with our own solution to the prevalent world problems that caught our eye, and only then try to

turn back to the already existing solutions provided by that technology. Try to relate our solution with the solution provided by that technology. This is a very crucial step in order to hone our thought process, and to learn in and out of technologies. Once our thought process starts following the right direction, it gets easier to appreciate how every new technology solves a particular problem in its own way. This brainstorming exercise would eventually help in learning new technologies.

Reinventing the wheel is another very important step to get a real hands-on experience. The world is expanding at a very fast pace, and it is fortunately gifted with a lot of intellectual minds. It is pretty much probable that the problem we face or observe right now is also faced and observed by others. Also, the solution we think of, can be simultaneously thought of by others. However, one thing that stands unquestionably true is that the execution to solve the same problem with same solution approach will be carried out differently by different individuals. Most of the time it is the style of our execution that distinguishes us. It can hence be stated without any hesitation that there isn't any harm in carrying forward other's work, as long as we do it in our own way. Reinventing the wheel is something which gives us a chance to learn the nitty-gritty of problems and also the shortcomings in its solution. More importantly, it makes us experience as others who are working towards achieving the same goal.

Sharing is in the heart of software industry. Never has just one company/individual ever built any technology that could solve the problems of the entire industry- be it a programming language, Operating System, or something apart from what we know.

In the past few decades many companies have started off with a small idea or a "baby project", and it gradually got converted into a giant company. The most fascinating part is that you can come up with technology products even with zero funds in hand. All it needs, is a group of individuals willing to dedicate their time and efforts. Therefore, it is very much important for us to inculcate ourselves in the activity of building at least one product every year right from our college time. Products can be based on any idea. For example, you can think of building any of the following as your pet project:

1. Your own Operating System
2. Your own Internet Browser
3. Your own Search Engine
4. Your own Map
5. Your own Video player
6. Your own Audio player
7. Your own video encoding algorithm
8. Your own Audio encoding algorithm
9. Your own image type
10. Your own favourite online game
11. Your own database
12. Your own robot
13. Your own programming language
14. An online course management system
15. Build application like Facebook
16. Discussion portals like Stack Overflow/Quora

Sharing is in the heart of software industry. Never has just one company/individual ever built any technology that could solve the problems of the entire industry- be it a programming language, Operating System, or something apart from what we know. It has always been developed with collaborative efforts and sharing. We should always be willing to share our product or idea free of cost with others to get a feedback, and learn about what others are doing in same domain. Try to be a part of the open source community. Once an individual has a look at the amount of knowledge that is being shared free of cost, they realize the power of collaboration. Also, if fate permits, one must never leave an opportunity to travel across the world, meet new people and learn about the kind of innovations happening on that side of the world.

Computer Science Engineering, in col-

laboration with Electronics Engineering are the only engineering streams that touch almost every domain of human lives and every industry. Health care, aerospace, automobile, telecommunication, education, agriculture, banking, marketing, and every other industry we lay our eyes on, we find Computer Science and Electronics in the core of it. Doesn't matter if, after your B.Tech or M.Tech degrees you wish to continue working as a Computer Science Engineer or you aim for an MBA; you will be handling a product whose major part has been contributed by Computer Science. Much of the world's MBA graduates join major technology companies.

Internet is continuously transforming human life and in the way industries function. It would therefore be extremely beneficial to get the expertise on Internet technologies. There are many technologies being utilized to build Internet based applications. These days MEAN stack is gaining more attention to build Internet based applications and native apps. MEAN extends as Mongo Database, Express to support HTTP, Angular js and Node js. 'React' is also a relatively new language that needs to be explored, as it provides out of the box solutions to solve Internet based application problem and also provides native app solution. JavaScript is at the core of Internet based application development. The way English language is helping the entire world to communicate in one language, JavaScript has similarly become the primarily preferred language to design frontend, backend, database and even native apps. Day after day, it is becoming more powerful, and hence it is suggested to get a thorough insight on it.

And finally, being a part of the prestigious IIT group, we should take a leaf out of the history of major universities abroad and work towards developing our Computer Science department to be one of the best in the world, which would only be possible by the collaborative efforts of the students. We have to excel in all the areas so as to attract better talent and the best of the recruiters. We must also show keen interest in participating in research and development activities. And most importantly we should encourage the students and professors to make efforts in coming up with new ideas for startups as well. Only then will we be able to keep reinventing, innovating, and propagating this never ending journey. •



THE ANNUAL DAY

Soham Satyadharma
B.Tech 2018

The function of education is to teach one to think intensively and to think critically. Intelligence plus character - that is the goal of true education.

The second annual day of the department of Computer Science and Engineering, Indian School of Mines, Dhanbad, organised on August 29, 2015 at the good old Penman auditorium, added another feather in the already embellished cap of the department. Prof. D.C. Panigrahi, the honourable Director of the institute was the Chief Guest of the function, while Prof. Amares Chattopadhyay, the founding father of the department itself, was the Guest of Honour. Despite the audience being treated to popular Bollywood numbers before the arrival of the guests, the event, as always in this part of the world, formally began with the traditional lighting of the lamp by Prof. Panigrahi, Prof. Chattopadhyay, and the office bearers of the CSE society. The mesmerising invocation song by students of B. Tech first year followed.

The welcome address was delivered by Dr. Chiranjeev Kumar, the Head of the Department and the President of the CSE society. Thanking the esteemed guests for attending the event despite their busy schedule, he extended his gratitude to all students and faculty members of the department. Harping on the importance of alumni relations, he wished that Confluence, the alumni get together, will be organised in different cities every year. Moving on to competitive coding, he mentioned the various achievements of CSE students in this field. Calling Buffered Reader, the third edition of which was launched later, 'the identity of the depart-

ment', he spoke about the international collaborations of the department with the Arkansas State University in USA, University of Tunis, Botho University in Botswana and University of Glasgow in UK. Stressing on the ever growing popularity of the course, he mentioned the branch changers, the rapidly improving placement scenario, the new, but refreshing trend of students opting for higher studies and the developing infrastructure. Lamenting the lack of funds, he concluded with the line "Challenges are what make life interesting; overcoming them is what makes life meaningful" which indeed kindled the latent energy within all the students assembled in the hall.

Dr. Amgooth Tarachand, Assistant Professor of the department, and the faculty advisor of the CSE society thanked Prof. P.K. Jana, the founding head of the society. Saying that the very existence of the society was spread awareness about CSE, he gave an account of the various events organised by the society, including Coderush, Quiz Wiz, Code Marathon and the flagship event of the society, Confluence. Profusely thanking the annual day organisers, he concluded his speech hoping for a better future.

Dr. Arup Kumar Pal, Assistant Professor of the department, and the treasurer of the CSE society, welcomed all the first years and briefed the gathering about the various expenses of the society. He was followed by Mr. Bhavishya Mathur, B. Tech 2017 and the vice chair of the ACM Student Chapter,

ISM Dhanbad. After giving a brief introduction about the ACM Student Chapter of the institute, he highlighted the various events organised by the chapter, including the series of android workshops conducted last year, Ode-De-Code, Googol and Powerpuff coders.

The benevolent sponsor of Code Marathon, Mr. Dilip Kumar, B. Tech 2006 and currently working in the American Express in Phoenix, US was conferred with the alumnus of the year award, which is annually awarded to the alumnus with utmost contribution to the department. Despite his busy schedule and the time zone difference, he took out time for a Skype session. Speaking from his experiences in the industry, he entreated the faculty to include a subject on web application development in the curriculum. Saying that the alumni have a lot to share, he advised the current students to find a mentor from the alumni. He instructed the students to concentrate on the subjects taught in the institute and bring their own ideas to the fore, like building a search engine, browser, operating system etc. Opining that the experience gained from start-ups is invaluable, he implored the students to start their own start-ups, not confine their expertise to one domain, prepare for exams like CAT, GRE, and GMAT and keep themselves abreast of the latest developments in the ever changing world of IT.

Five students from B. Tech 2016, who were offered an internship at Amazon India Development Centre Private Limited, were felicitated with a certificate of recognition from the society, following which, the first rankers in the three divisions of Code Marathon were also presented their certificates.

Prof. Amares Chattopadhyay, the first head of the department, regaled the audience with anecdotes concerning the

origins of the department. Recollecting memories much distant, he spoke about how the department was born all the way back in 1997, when Dr. Dalim K. Paul, the then director of the institute and himself discussed the need for a department of Computer Science and Electronics. Despite no infrastructure and hardly any faculty members, there was no compromise on the syllabus. Prof. Chattopadhyay himself took a 3 week intensive course for IIT Delhi on subjects like operating systems and networks; sitting through 8

Challenges are what make life interesting, overcoming them is what makes life meaningful.

of the Ford Mustang, which sold like hot cakes in the market despite initially being a flop, as an example, he underlined the oft stated fact that patience is indeed a virtue. Heaping praise on the leadership skills of Napoleon, he also emphasized the importance of leadership qualities. Prof. Chattopadhyay was then presented with a memento by Prof. Panigrahi, while he himself received a memento from Dr. Chiranjeev Kumar. The formal part of the evening was concluded with Mr. Ashay Sinha B. Tech 2016 and the incumbent secretary of the CSE society, delivering the vote of thanks.

The ensuing cultural events lent an artistic angle to an evening which had been ceremonial till then. The lively performances by the enterprising performers were amply cheered. From the stand up comedy performances that left all assembled laughing their hearts out, to the melodious songs, from the back bending dances to the emotional drama on the life of Bharat Ratna A.P.J. Abdul Kalam that resulted in many a tear, to the staggering instrumentals, the audience was entertained like never before. The deserving performers were duly rewarded. While Mr. Utkarsh Bhatiya, Mr. Santosh Kumar and Mr. Mani Shankar were respectively awarded for the best solo dance, best stand up comedy and the best solo song respectively, the first prize for the instrumental song went to Prajwal Panzade-Camellia from M. Tech first year.

Prof. D.C. Panigrahi, the director of the institute and the patron of the CSE society, while beguiling the gathering with stories from the past, saluted Prof. Chattopadhyay, who had taught him basic mathematics when he was a student of the institute. Highlighting the fact that parallel processing was the most sought after subject in Colorado School of Mines, historically a mining institute, he said that information technology will indeed make waves in the near future. Taking the story

NATURE-INSPIRED PARADIGMS

AN EMERGING TREND IN COMPUTATION

| Dr. Haider Banka

Modern day world has already seen many advances in the arena of computation, performance efficiency, and will definitely see many more of these in the future as well. Ranging from the ancient concept of simple abacus to the contemporary supercomputers, many things have changed and have contributed to some of the greatest pioneering works and achievements. But do these systems have the properties of self-repairing, reproduction or are they able to work with noisy and inconsistent data having huge dimensions and sizes, or can they obtain the best output for a problem when the search domain involved is very huge? The answer to this question is 'No'. Even if the best technology is chosen and the best resources are employed, still a system with all these powers cannot capture the explosive growth of the search space with large inputs. On the contrary if Mother Nature is considered, all of its constituents come together- from the seemingly insignificant micro-organisms to the much bigger beings comprising flora and fauna- and provide the capabilities to self-repair, to identify and process noisy or inconsistent data, to reproduce its own kind, and to even find the most suitable places for habitat, and similar day to day activities wherein the search space is as large as entire earth. Human beings as a specimen of nature's masterpiece have many capabilities that even the most modern day system can only dream of. The hindrances in the path of technology have provided the base for searching for newer algorithms that can imitate nature and develop systems that try to fill the above lacunae. The

applicability of these systems is fruitful in all those scenarios where the conventional systems fail to produce acceptable solutions due to gigantic search space and time constraint.

Trailing back in the history, the first formal development of such algorithm could be found in the documents framed by the great mathematician and cryptanalyst, Prof. Alan Turing in 1945 and 1948 at Bletchley Park, London and National

Look deep into nature, and then you will understand everything better.

-Albert Einstein

Physical Laboratory, UK respectively. He called his search algorithm as Heuristic i.e. yield from trial and error, which can generate the correct result but the correctness is not guaranteed. Later in the year 1962, the most pioneering work that paved its way for further developments was the invention of 'Genetic Algorithm' by John Holland and his collaborators.

This algorithm imitated the natural selection based on "survival of the fittest strategy" by Charles Darwin, and proved to be an abstract model for solving many optimization problems. The algorithm used novel operators like crossover and mutation along with proper a mechanism

of selection. This algorithm turned out to be a boon and solved many optimization problems (including multi-modal and constraints optimization problems) and even to deal with noisy data situations and discontinuous functions. Although it might happen that the algorithm does not always generate the exact solution, but it has been observed that it provides near optimal solutions even to the problems which cannot be optimally solved



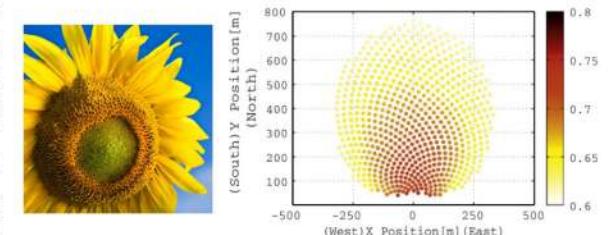
in polynomial time (such as NP-Hard problems).

Further such works based on emulation from nature include evolutionary strategy by Ingo Rechenberg and Hans-Paul Schwefel in the year 1963, and the development of Ant-Colony Optimization by Marco Dorigo in the year 1992. From then on, many new nature-inspired algorithms like Differential Evolution, Particle Swarm Optimization, Firefly Algorithm, Cuckoo Search, Bat Algorithm, Flower Pollination Algorithm, Chemical Reaction Based Optimization got derived. On being thoroughly tested, these algorithms proved their immense capability to solve many single and multi-objective optimization benchmark functions.

All of these algorithms clearly have an ability to evaluate the best solution by hunting the search space in parallel fashion and choose the further solutions depending upon the previously obtained best results. This improves the capability of the algorithm to quickly provide acceptable results in polynomial time. Since the correctness of these algorithms is questionable, their usage is limited to conditions where a certain amount of error and uncertainty can be tolerated. The question that arises out of

these algorithms having a common root is which one is to be preferred, and when? This could be answered with the help of a very established theorem known as the 'No Free Lunch Theorem', proposed and proved by Wolpert and Macready. Simply put, the theorem tells that though the average performance of all these algorithms are the same, the difference lies in their approach towards solving the problem. As different types of problems bear different levels of diversity and complexity, a single algorithm cannot provide solutions to all of them. Clearly, it can be stated that all types of problems cannot be solved by any single nature inspired algorithm and thus there is a need of many algorithms.

But how to measure the capabilities of any such algorithm? To judge this, there are two typical concepts that gauge how well the algorithm is going to perform. The first measure is diversification, and the second is intensification. Diversification is the capability of the algorithm to explore the search space, whereas intensification refers to the capability of searching the local region by exploiting the already obtained good solutions. Many changes have also been made to



these existing algorithms to solve different kind of problems which have led to various types of encoding schemes, various types of operators and ultimately numerous advanced versions of the same algorithm.

From the very advent of the concept of nature-inspired algorithms, researchers have been keenly thinking of all the different applications of these algorithms. Although most of them were used in research oriented fields only, they have now spread their wings in all domains starting from computer science, mechanical and structural engineering to the fields of business management and adminis-

tration. It has been observed that many well-established companies run Genetic Algorithm as a daily routine to solve many tough combinatorial problems of data mining, planning, scheduling, image-processing and gaming. Nature-Inspired algorithms have a huge applicability in many other interdisciplinary fields also. Algorithms like Genetic Algorithm, Particle Swarm Optimization, and Cuckoo Search etc. have already been used to optimize many real life problems like design of welded beams, springs, in the fields of signal processing, network communications etc., and it has been observed that these algorithms outperform many traditional approaches in terms of time and resource consumption, but still a lot is left. Till now most of the algorithms are very problem specific and there are a huge number of problems that cannot be solved by a single algorithm. It has been seen through rigorous testing, that at times these algorithms can suffer from the problems of premature convergence and get stuck in local optima. It has also been observed that most of these algorithms tend to evaluate the same solutions repeatedly and leave many untouched. Thus, there is a huge scope to improve or devise new algorithms,

IN CONVERSATION WITH RAHUL PAUL

He was a part of *BufferedReader*. And even after all this time, his connection with *BufferedReader* remains strong as ever. Mr. Rahul Paul, M.Tech Class of 2015, who is a PhD Scholar at University of South Florida, had a conversation with *BufferedReader* writers Lokendra and Sudha Shanker.

Lokendra-Sir, how does it feel like to be interviewed by the magazine of which you were such an integral part?

Rahul Paul- It feels great, actually (pauses) nostalgic. I was a part of the magazine since its inception. I can still remember the first edition of the magazine, in fact the first meeting too. Particularly, I would like to thank Sukomal Pal Sir, Shweta Malwe Ma'am and Chiranjeev Kumar Sir for giving me the opportunity. I will never forget the team behind the success of our magazine. I would like to thank the past and present members and wish good luck to the future members of this magazine. I would support the magazine and its team anytime in the future.

Sudha Shanker-Why did you prefer PhD over other options available to you?

Rahul Paul- Money is not really something that I want. I have always wanted to learn something new and discover new things. Plus it helps you improve your abilities to understand and solve problems, develops your confidence and makes you a better communicator.

Lokendra-Was the decision teaching or research oriented or something else? What are the options after PhD?

Rahul Paul- For now, at least, it is research oriented. After attaining the degree, I want to do something research oriented. I personally believe I am better in research than teaching. And talking about options, there are several like research jobs in R&D companies like Google, Microsoft and IBM, teaching and even entrepreneurship.



RAHUL PAUL
PhD Scholar
University of South Florida

Sudha Shanker-Why did you opt for the USA, and not any other country, say, India?

Rahul Paul- Well, study in India is quite academic oriented while in the USA it is research as well as academic oriented. Lots of projects and assignments are there as a part of every course here, which is generally not the case with India. Moreover good lab facilities and research opportunities, which are quite necessary for some subjects, like Image Processing and Computer Vision, are not available in India apart from a very few universities like IISC, IITs, etc.

However, it's not a very big issue. In fact, people like Dr. Ramesh Jain (PhD, IIT Kharagpur), one of the most renowned professors in Computer Science, Dr. Manindra Agarwal (PhD, IIT Kanpur), a renowned professor in Mathematics and CSE, who won several prizes like the Gödel prize and the Padma Shri, Dr. E. Balagurusamy (PhD, IIT Roorkee), the famous author of several popular books about C and C++, pursued their studies in India.

Lokendra- In terms of the academic culture, what is difference between the USA and India?

Rahul Paul- Frankly speaking, securing marks in India is quite difficult compared to that in the USA, but obviously, it varies from subject to subject and professor to professor. Here, owing to the sheer number of assignments and projects in each subject, you need to study for the

whole semester consistently otherwise your grades will not be good.

Sudha Shanker- Compared to India, how different is the role of a Teaching Assistant in the USA?

Rahul Paul- In India, we need to organize lab sessions and exams. But here, you have to assist the professor who is taking the course. A TA's work here is to check assignments, projects, prepare questions for assignments, projects and exams, and check exam copies, if the professor asks you to do. Sometimes you have to take classes if the professor is out of the station. Most importantly, TA's here have their own office hours. The students can come to clear their doubts regarding assignments, coursework and projects. If you are very senior TA, you may be assigned to take classes for undergrads mostly in summer and sometimes even in the fall or the spring semester.

Lokendra- Is there any short path to a PhD, apart from the whole B. Tech, then M. Tech and then PhD routine?

Rahul Paul- In the USA, you can directly apply for PhD immediately after your B. Tech, but you need a good research profile to get into a good university.

Sudha Shanker- Comparing it to an average Indian package in CSE, can we call the system in the USA 'earn while

you learn'?

Rahul Paul- Yes, you may call it so, but you get a nice stipend while pursuing PhD in India too. Here, it is also similar but then, it depends on location and the cost of living, which is much lower in India.

Lokendra- What about the stipend you get here?

Rahul Paul- Now I am getting around 1400 dollars per month. It is more than enough for a comfortable lifestyle. As I had said earlier, stipends vary from state to state. Stipends in Floridian universities are quite lower than those in universities in New York or California, as the cost of living in Florida is comparatively lower.

Sudha Shanker- Is getting a good GRE score enough for a PhD?

Rahul Paul- No, just getting a good GRE score is not enough for a PhD. For MS, good GRE Score, TOEFL score, decent GPA, good projects and internships are enough. But if a PhD has to be added to your qualifications, your research topic, research experience and good papers matter. Again, you need to find a professor under whom you will do your research, which is not the case for a MS unless you are doing a Master's thesis, which very few actually do.

Lokendra- Sir I have seen many pictures of you on Facebook. You surely are fulfilling your dreams like "Zindagi Na Milegi Dubara" but are you really studying?

Rahul Paul- (laughs) Oh yes, I am. Actually, now that I am really far away from home, I am quite free to hang around in the weekends, not regularly but at least once in a month. And basically I have lots of dream to fulfill, which I can fulfill here. So, though, studying is obviously the main priority, hanging around is also needed, when you are away from home.

Sudha Shanker- (smiles) So is that the message you want to convey to your juniors?

Rahul Paul- See, I believe in a simple phrase, "Study Hard but Party Harder". And I am getting a notion that you want to wrap up the conversation now (laughs). So goodbye and best of luck for your future.

Lokendra- The boss is always right (smiles), however with you the conversation is always cumulative.

Lokendra and Sudha Shanker- Goodbye Sir and wish you good luck for your studies and, of course, we hope that you fulfil your dreams.

Annual Sports Day

- | | |
|---|--|
| <p>• G Sai Srinivas - B.Tech 2018 :</p> <ul style="list-style-type: none">1st in 400 m Relay1st in 4 * 400 m Relay1st in 4 * 100 m Relay3rd 200 m Relay | <p>• Aastha Priya - M.Tech CSE-IS :</p> <ul style="list-style-type: none">1st in Discus Throw2nd in Three-Legged Race |
| <p>• Katta Abhishek - B.Tech 2019 :</p> <ul style="list-style-type: none">3rd in 4 * 400 m Relay3rd in Triple Jump | <p>• Prafulla Munda - M.Tech CSE :</p> <ul style="list-style-type: none">2nd in 800 meter Race3rd in 1500 meter Race |
| <p>• Aditya Kaushik - Dual 2019 :</p> <ul style="list-style-type: none">3rd in 110 m Hurdles Race | <p>• Bashiram Basumatary-M.Tech CSE-IS:</p> <ul style="list-style-type: none">2nd in 200 meter Race3rd in 100 meter Race |
| <p>• Krishnachand Birla - B.Tech 2019 :</p> <ul style="list-style-type: none">3rd in Relay Race | <p>• Khushbu Goyanka - M.Tech CSE-IS :</p> <ul style="list-style-type: none">2nd in Spoon Marble Race |



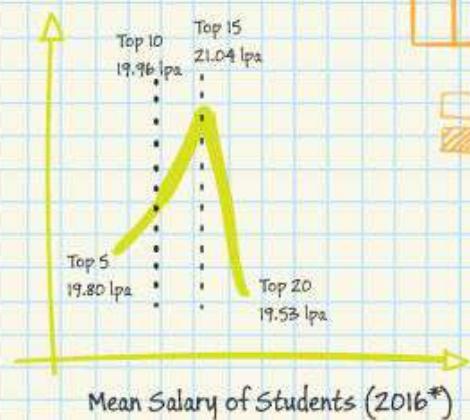
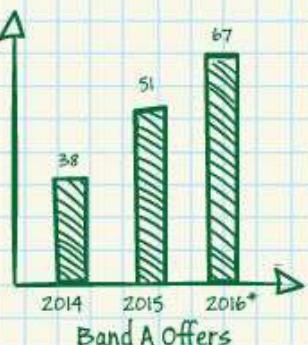
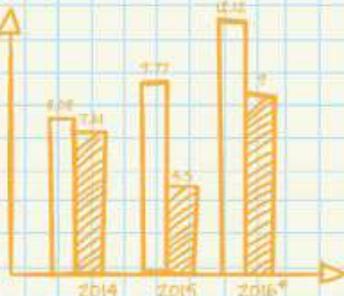
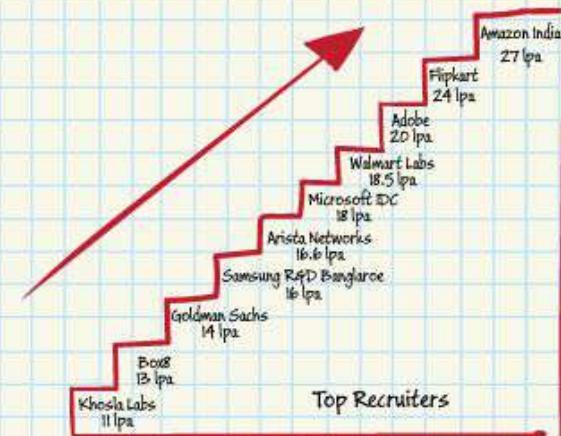
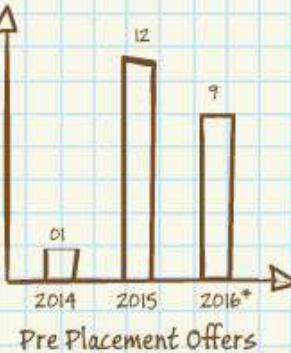
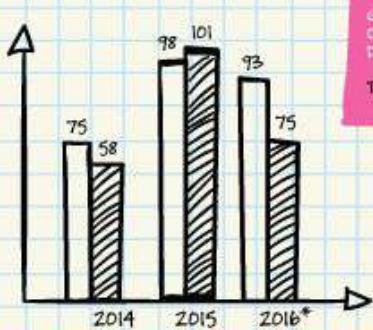
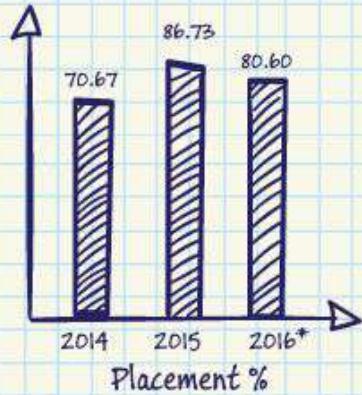
Photographed By
Akshat Goyal | Dual 2018

Aperture f/4
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COLORFUL PROVIDENCE



STATISTICS 2016



* Mean and Median Salaries have been calculated only for placed students.
* Placements SGT Continuing

WHAT WE SAID

Rishabh Mehta | B.Tech. 2017
Nishit Vivek Dabi | B.Tech 2018

stead of giving another. At such a time, be calm and try a different approach. For that very question, I came up with many possible solutions. Eventually, as it turns out that all of them were wrong, yet I was able to make it through the interview because if they're intriguing you a lot, they're not expecting you to solve the question, they just want to check how you perform under pressure. So be positive during such a situation. *



Sajid Hussain

Walmart Labs

Tell us what does an HR expect from you?

An HR would usually expect you to have sound technical knowledge. He expects you to be compatible. He expects that you should be able to work in the company on the terms and the environment of the company. As long as you can prove to the company that you can work on any project, they'll recruit you not caring where you did your internship from. But of course, if you have done your internship in a good company, it will definitely give you an edge.

Also, I remember one of my interviews during which I was a given problem. I came up with a solution but it turned out to be wrong. The interviewer insisted me to solve this question only in



Vivek Kumar

Adobe

According to you, does GPA play an important role as far as placements are concerned? What is the best time to start preparing for your campus placements?

By the end of my first year, I was very well acquainted with the languages - C and C++ and when Data Structures and Algorithms were introduced to us during our second year, I started competitive coding. I believe, coding is much important than the academics. Also, one's GPA isn't very important. Short listing students is the one major task for which one's GPA is taken into consideration but after that it doesn't play much/any role.

I believe, we actually start preparing for interviews or start coding after our second year and waste a lot of time during our first two years. Hence, an advice to all the first years and second years would be that you shouldn't waste much of your time and that you should start

coding as early as you can. You can get in touch with seniors and should start developing your coding skills a lot earlier. You shouldn't worry much. Work hard and eventually things will come across your way. *



Anant Kumar

Amazon India

What intrigued you to pursue computer science? Tell us how important MIS has been in getting you a job offer?

When I was about to appear in JEE, the news that a student from NIT Allahabad had bagged a coveted job offer from Facebook Inc. was the talk of the town. Firms like Google, Facebook, Flipkart and Amazon have always fascinated me. And if at all I had to be a part of them, which I have always wanted to, eagerly, I would have had to become a Computer Engineer. Hence, CSE happened.

I happen to have a sound knowledge of web development. I became a part of the MIS team in my pre-final year and also worked for it in the summer following it. HRs of various companies asked me about MIS and my role in the team. In Walmart interview, specifically, I was interviewed on MIS for about an hour. It's not just about MIS, I believe. Every project that we do under the guidance of professors count. They enhance our profile. But at the same time we need to

have a sound knowledge of everything we mention in our CV.*



Amit Shekhar

Box8

Tell us, how important is a good internship in enhancing a student's profile?

An internship with a reputed firm, definitely, enhances your profile. Students are often asked in their campus placement interviews as to what company they interned at. So, if someone has worked in a good company, it's always a plus one.

In my opinion, during an internship, the company treats you like a regular employee. Consequently, you need to work in the same way as everyone else does. That is what is expected out of you. You shouldn't feel that you are a part of the company for mere 2 months, because those 2 months would be very crucial for you. Internship is not just about one restricting himself or herself to the assigned project. Interacting with people, setting up one's profile, networking are equally important, beside the primary objective of learning as much as possible. *



Surendra Singh

Flipkart

Share your experience of interning at Amazon India. How crucial has it been for you?

My internship at Amazon was very vital for me. It helped me a lot. It gave me an upper hand during my interview of Flipkart as working of both the companies is almost same. Since, I had a knowledge about working for an e-commerce company, things were a bit favourable for me and so I strongly believe that interning in a reputed company does make a difference, especially when you're sitting for a company whose working environment is same as that of the company where you did your internship. And apart from this, you even get an exposure of the corporate world.

Moreover, during your internship, it's not like you code 24 x 7. No, instead, you can and you should interact with your team members, with other people, make contacts and set up your profile and try to learn a lot from everyone and everything around. *



Kanmantha Reddy

Samsung R&D, Bangalore

Tell us something about your ultimate goal, you views on projects in ISM?

I have always wanted to become an IAS officer. And engineering is something that is just helping me achieve it. I anyway needed a bachelor's degree, so I thought why not engineering.

I believe that projects play a very important role in building up your profile. But when I look at the kind of projects an average ISM student does, they are not as strong as what students in reputed IITs do. I think that we must be given an option to choose the domain we want to work on. Instead of randomly assigning projects to students, I believe students' interests should be taken into

consideration because working on a domain which is not of your interest wouldn't do any good to you. *



Nikhil Mittal

Goldman Sachs

Given that you are placed in Goldman Sachs, tell us how important it is to have good soft skills? Tip us on how to prepare for placement interviews.

You would often meet seniors who would say that if you are a student of CSE, you should only focus upon honing your coding skills. Well obviously, honing one's coding skills is very important. But now, the placement trends of students of CSE at ISM are changing. Especially with firms like Goldman Sachs and Samsung R&D, Bangalore, visiting the campus for internships and recruitments, you need to have good soft skills. It increases your chances of getting selected. Everything aside, as a professional individual, you must and you should have good soft skills.

Everyone says that during an interview if you're given a question, try to solve it and that you shouldn't give up. I consider this strategy to be dangerous. You should act smartly. I mean, you should keep a track on how much time you're spending on that very question. I believe it's good to struggle, but if you think you can't solve it and that you're spending a lot of time, then give up. Don't waste much time. And finally when you're preparing for interviews, prepare smartly; Solve previous interview questions of that company because questions usually get repeated. *



Shubham Bansal
Practo/Flipkart

CSE in ISM is growing at a very fast pace so all the students know that their future will be safe here, all they need to do is put some effort. I simply did competitive coding in the second year, step by step learned the Geeksforgeeks and solved almost all the question in Leetcode and Interviewbit. For learning I used SPOJ and Codeforces for contests, they both are decent sites. Also, I had made a good project, it made my CV look attractive. The interviewer asked a lot about the project because it was something on which I worked. I believe that companies prefer research projects, because developing is a thing which everyone is doing, research field is really helpful because at the end there you will have to create something new.



Kunwar Sachin
Goldman Sachs

In 11th standard my parents suggested me to take CS as a subject. In about six months I started liking it and eventually planned to pursue my career in it. At that time I worked on my analytical skills a lot. When I joined ISM, finance and optimization caught a hold on me. I got an insight of competitive coding through CodeISM. I started studying finance on my own and later took it as a minor which gave me an upper hand in the interview. Since the beginning I wanted to work in the finance sector and now it's a dream come true. Though I've been selected in the technical sector, the transition to the financial sector is pretty easy. I have opted for both minor

and honors and it is a very difficult job to maintain the balance between them. It requires a lot of commitment and devotion from my side. Even though their slots were divided, the classes used to clash.

Dennis Ritchie's book on C. I would like to suggest my juniors to improve their coding to an extent that it does not create hindrance and maintain a healthy competition among yourself, give help and take help.



Nagendra Gupta
Samsung R&D,
Bangalore

The feeling at the time of group discussion was just amazing, it's a kind of feeling which I can't describe in words. The topic we got for the GD was 'Future of Smart Devices'. The HR was interested to know as to what does a person interpret about the future of a particular technology and what can be the possible contributions. They also looked for good communication skills in the candidates, and after our GD, I think that soft skills really help you. Even if you aren't sound in technical knowledge, you can cover it up with your expertise in communicating. But, if you are very good at technical skills and not even at par in communicating then you may have to face adversities.*



Prince Raj
Google

If you have to give a proper analogy of how I came to love computer science, it was an arranged marriage in which love happened to come off just late. I learned JAVA as a language in the summer vacations prior to second year and then moved on to competitive programming. All the while I kept reading Introduction to algorithms by Cormen, which pretty much lives to its title 'The Bible of Algorithms'. On some of the coding platforms I have submissions in excess of 500-600 with decent ratings in almost all major platforms. I also worked on MIS as it gave me an opportunity to learn web development. With CodeISM and other initiatives, students can learn pretty early what we did an year than them. Once you know what you want, it's the word Go from day 1. You need to set your priorities straight- that's it.



Akhil Ojha
Arista Networks Inc.

I really got disheartened after not clearing the aptitude round of Samsung R&D, but my parents and friends showed faith in me and did not let me lose hope. After being rejected by four companies, Arista was the only company in which I got short listed, so I was like "Okay fine, nothing really matters, I will give an interview and come back". In the interview they asked me basic C questions in detail, which I was able to answer since I had read and understood



Rajesh Sinha
Flipkart

I suggest my juniors that at this time (first and second year) you should really focus a lot on coding rather than just working on GPA. Maintain a decent GPA, improve your coding skills, work on projects like Big Data, Image Processing, etc. and try to indulge yourself in some group activities which can improve your communication skills.

MACHINE LEARNING

Akshit Varma
B.Tech. 2018

is a method of data analysis that automates analytical model building. Using algorithms that iteratively learn from data, machine learning allows computers to find hidden insights without being explicitly programmed where to look.

Supervised Learning algorithm receives a set of inputs along with the corresponding correct outputs, and the algorithm learns by comparing its actual output with correct outputs to find errors. It then modifies the model accordingly. Through methods like classification, regression, prediction and gradient boosting, supervised learning uses patterns to predict the values of the label on additional unlabeled data. Supervised learning is commonly used in applications where historical data predicts likely future events. For example, it can anticipate when credit card transactions are likely to be fraudulent or which insurance customer is likely to file a claim.

Unsupervised Learning algorithm is used against data that has no historical labels. The system is not told the "right answer." The algorithm must figure out what is being shown. The goal is to explore the data and find some structure within. Unsupervised learning works well on transactional data. For example, it can identify segments of customers with similar attributes who can then be treated similarly in marketing campaigns. Or it can find the main attributes that separate customer segments from each other. Popular techniques include self-organizing maps, nearest-neighbour mapping, k-means clustering and singular value decomposition. These algorithms are also used to segment text topics, recommend items and identify data outliers.

Reinforcement Learning algorithm is often used for robotics, gaming and navigation. With reinforcement learning, the algorithm discovers through trial and error which actions yield the greatest rewards. This type of learning has three primary components: the agent (the learner or decision maker), the environment (everything the agent interacts with) and actions (what the agent can do). The objective is for the agent to choose actions that maximize the expected reward over a given amount of time. The agent will reach the goal much faster by following a good policy. So the goal in reinforcement learning is to learn the best policy.



WHAT THEY SAID

| Maheswara Reddy Chennuru | Dual 2018
Aditya Sood | Dual 2020



Practo, the healthcare software & search company connecting patients and doctors all over, was one of the recruiters this year. On student projects, the HR from Practo emphasised upon the need of projects on which the students work, be diversified. "Most of the students were working on projects related to the MIS. While it is understandable that something as large as MIS requires an adequate number of individuals; the problem lies in the fact that if too many individuals work on the same project, then they tend to stop analysing & understanding what they are doing. They just simply keep on doing the work without gaining any valuable lessons or inferences from it. Instead, they should come up with new projects on their own; based on problems or situations which they face and can come up with solutions to."

When asked about the importance of internships to get placed, he said, "Having a full-time

internship is not a major decisive factor when it comes to calculating the result of the recruitment process at Practo. If you didn't have a summer internship, but are good enough, we will hire you all the same. But the experience certainly comes in handy. "However," he added, "if you didn't go for an internship but worked on your own on a good project, then it is certainly good enough for us. We view the two experiences as equivalent."

Finally, on whether web development skills were important, he said "Yes, they are. Right now, Practo is focussing mostly on web development. 80% of our work, at present, deals with web development". "It all depends upon the requirements of the working environment of the company at the time of recruitment", he concluded.



Samsung has evolved to be a world-class corporation with business that spans advance technology and develops software for Samsung's Technology Solutions across different products. It was one of the major recruiters this year. The interviewer said that it was wonderful to be here in ISM for placements and that everything was meticulously planned. Regarding projects, he said "Long term big projects are always better than doing something small as they add value to work. I didn't see lot of projects in the CVs I received but few of them were definitely interesting." On previous internship experiences, he commented, "It doesn't hold

much value unless you have done something special and depends upon the value of the project. It all depends on how much you have gained from the internship." Lastly regarding students and specific qualities, they look for in them, he told, "We look for the core computer science knowledge and exceptional problem solving skills. Even though students here have good problem solving skills, what they lack is communication skills. They play a major role while working with the team. The ability to express unambiguously is a major factor in this field."



Amazon India, which is among the largest e-retailers in India, was one of the copious recruiters in this year's placement sessions. This is what their interviewer had to say: "The students whom we have recruited certainly lived up to our expectations. But we were expecting a much better crowd based on our past experience. Everyone was very good at coding. It seems like all of you have been doing a lot of competitive coding. However, they were not very good with their computer science fundamentals, and real application data structures. When it came to ap-

plying data structures for enterprise level software building, they were comparably weaker. Simply knowing data structures is not enough; you need to know how to use them to solve problems." He also added a suggestion for the students, saying, "They can improve on these areas by getting further involved in projects based on problems which they face in their daily life". "Finally", he further added, "they also need to further improve on their communication skills. There is still a tinge of nervousness in them, which needs to go."



Flipkart, the first billion dollar company in Indian e-commerce was one of the very first recruiters that visited ISM. The HR from Flipkart was considerably impressed by ISM students and she stated, "Of the few campuses we went by this year our experience here is great. However we were not very much impressed with the final year students compared to the pre-final year students who seem to be in touch with coding. So there is still lot of scope for everyone to hone their problem solving skills and concentrate more on the basics and those are the things we primarily look in the candidates." On language preferences and previous experiences she said, "At Flipkart we do

not have any preferential language as long as you code and the outcome is acquired. As soon as they join they get to start working on real-time projects in-spite of prevalent thinking of just web improvement. In the end it all depends on the candidate and the domains which interest him." In the end she commented that there should be a provision of six-month internship program in the curriculum because it gives the organisation more time to analyse the candidates. She asserted that it gives students more time to work on projects which they lack in two-month internship.

DEPARTMENT HIGHLIGHTS

Ashay Sinha, B.Tech 2015 | Soham Satyadharma, B.Tech 2018 | Vaasudev Narayanan, B.Tech 2018

REPRESENTATIONS TO THE ISS

● Maheswara Reddy Chennuru

(3rd Year, Dual Degree) was selected as Computer Science and Engineering Society's representative to the ISS.

● Deepak Kumar

(2nd Year, B.Tech) was selected as the Overall Class Representative of the Sophomore Year.

● Saurav Kumar

(2nd Year, B.Tech) was selected as the Outstanding Student of the Sophomore Year.

● Madhusmita Dash

(3rd Year, B.Tech) was selected as the Overall Class Representative of the Pre-Final Year.

● Bhargava Parsi

(3rd Year, B.Tech) was selected as the Amber Hostel Prefect.

● Kriti Singh

(3rd Year, B. Tech) was selected as the Secretary of Cyber Society.

STUDENTS' ACHIEVEMENTS

Pawan Kumar (Final Year, B.Tech) developed a product, AAMI to help people with blindness (both partial and complete) and dyslexic patients to read a normal text book. AAMI is a standalone wearable device that can be worn on one's finger and as blind person scrolls his finger on book, the text in the book is read out. It also has the right angle guide to help the blind person to navigate the finger in a straight line and help him to move to the next line by giving an audio feedback. AAMI has won FICCI TERUMO POST JUGAADATHON AWARD 2015 and Touching the Life Award of Eureka!15 at IIT Bombay.



Aditya Kaushik (2nd Year, Dual Degree) stood first in ISM Open Swimming Competition for 50m Breaststroke. He also stood third in 50m Freestyle at the District Level Swimming Competition.

Rishabh Kumar (Final Year, B.Tech) won the 2nd prize at the Android App Making Competition organized by the Government of Jharkhand. He was felicitated for the same by the Chief Minister, Sri Raghubar Das.

Pavan Kumar (3rd Year, B.Tech) won a silver medal in 9th Jharkhand State Level Boxing Championship. He has also won various medals at university level.

The Students of M.Tech (CSE & IS) organized a food packet distribution drive for poor people on Diwali. It was a small effort from students' side to make the Diwali of poor people merry.

VISITS ABROAD

Dr. Sukomal Pal, Assistant Professor of the Department, visited the University of Padova, Italy during September 24th - October 24th as a Visiting Scientist. His research proposal on Information Retrieval along with Prof Nicola Ferro, who is the coordinator of Conferences and Labs of the Evaluation Forum (CLEF), Europe was awarded by the university. Dr Pal interacted with Prof Ferro on two joint works. The first one was involved with preparation and dissemination of standard test data on Indian language research. Another work was planned to see how document retrieval is similar to sub-document retrieval in the context of INEX data, another international text retrieval activity.

HIGHER STUDIES



Sarang Kapoor (B.Tech, 2015) joined Indian Institute of Technology Roorkee to pursue Ph.D in Computer Science and Engineering.

PH.D. AWARDED

- Mohd. Azharuddin
- Mohd. Naseem

- Ravi Sankar Sangam
- Dhirendra Kumar Sharma
- Manoj Kumar Mishra

R&D PROJECTS

- MCTI sponsored Rs. 36.06 Lacs for the "Information Security Education and Awareness (ISEA)" project.
- SERB (DST) sponsored Rs. 23.13 Lacs for the "Design of Reliable and Energy Efficient Transport Layer Protocols for Ad-hoc and Sensor Networks" project.
- DRDO sponsored Rs. 28.52 Lacs for the "Energy-Efficient Intruder Detection Schemes for WSN using Learning-based Techniques" project.

ACM OFFICE BEARERS

- Chair - Raj, B. Tech 2017
- Secretary - Rajat Gupta, B. Tech 2017
- Vice Chair - Aditya Kaushik, Dual Degree-2019
- Treasurer - Ayush Bhatia, B.Tech 2018
- Membership Chair - Pragya Priyadarshini, B.Tech 2018
- Editorial Head - Vaasudev Narayanan, B.Tech 2018
- Photography Head - Yash Goel, B.Tech 2018
- Webmaster - Rakeysh Ranjan , B.Tech 2018
- Design Head - Saurabh Saraswat, B.Tech 2018

SHORT TERM COURSES & WORKSHOPS

A workshop on "Information and Cyber Security" was organized by the department in collaboration with C-DAC, Kolkata from 28 - 30 January, 2016. The workshop was sponsored by ISEA and was intended for faculty members, persons from industry, research scholars, scientists and PG students. The objective was to increase awareness on Information and Cyber Security among participants with eminent speakers being a part of the workshop. It was coordinated by Dr. Sachin Tripathi and co - coordinated by Dr. Arup Kumar Pal.



A short term course on "Nature Inspired Algorithms and its Applications" was organized by the CSE department from 8 - 12 February, 2016. The course was coordinated by Dr. Haider Banka and co - coordinated by Dr. Chiranjeev Kumar. It was aimed at increasing awareness about nature inspired paradigms and its applications. The intended participants were PG students, research scholars, faculty members, scientists and persons from the industry.

The Department organized a short term course on "Fundamentals of Soft Computing and its Applications" from 9 - 13 September 2015. The course was coordinated by Dr. Haider Banka and co - coordinated by Dr. Chiranjeev Kumar. The main objective of the course was to familiarize the participants in the area of soft computing ANN, Fuzzy Logic and Rough Sets. The intended participants were faculty members from technical institutions, PhD, Research scholars, PG and UG students.

The Department organised a short term course on Advanced Data Structures with Their Applications from 1 - 5 October 2015. The course was co-ordinated by Dr. Sachin Tripathi. The course was designed to build preliminary knowledge of data structures along with introduction to advanced data structures such as B tree and B+ tree. Participants ranged from PG and UG students, research scholars to scientists and industry persons.

UPCOMING INTERNATIONAL CONFERENCES

The department is organising the 3rd IEEE International Conference on "Recent Advances in Information Technology" from 3rd to 5th March, 2016. The vision of the conference is to provide awareness about the recent advances in the Information and Communication

technology, through tutorial, keynote addresses and pre-reviewed research paper presentations. The conference will also serve as an excellent platform for all the participants to share their views and ideas. Another endeavor of this conference is to collate and present the latest

developments in IT/Computer along with realistic assessment of the current status and trends. RAIT-2016 is endorsed by IEEE and IEEE Communication Society Calcutta Chapter. [To know more please visit <http://www.rait.co.in>]

TECH TALKS

- Mr. R. Thirukumaran, SAT Infosys, Chennai delivered a lecture on "Network Simulator 2" on 19-20 August, 2015.
- Dr. Mohit P. Tahiliani, NIT Suratkhali delivered a lecture on "How to work on Network Simulator?" under the aegis of TEQIP-II on 21 August, 2015
- Dr. Mohit P. Tahiliani, NIT Suratkhali delivered a lecture on "Network Simulator 3" on 21-23 August 2015.
- Padma Shri Sankar Kumar Pal, Former Director, ISI Kolkata delivered a lecture on Machine Intelligence and Soft Granular Mining: Concepts, Applications and Big Data Issues" on 11th September, 2015
- Dr. Arindam Biswas, Associate Professor and Head of the Department of Information Technology, IIEST Shibpur, Kolkata delivered two guest

lectures on "Dynamic Data Structures with Applications" and "Voronoi Diagrams with Applications" on 2nd and 3rd October, 2015 respectively.

Prof. Sukumar Nandi from Indian Institute of Technology, Guwahati delivered a talk on "Physical & MAC Layer Attacks in Wi-Fi Networks along with their Countermeasures" on 28th January, 2016.

Dr. Amit Chaudhuri, Group Head - ICT & Services, C-DAC Kolkata delivered a talk on "Holistic Approach towards Information Security" on 28th January, 2016.

Prof. Rana Barua from Indian Statistical Institute, Kolkata delivered a talk on "Public Key and Attribute Based Cryptography" on 29th January, 2016.

Dr. Soumyadev Maity from National

Institute of Technology, Rourkela delivered a talk on "Intrusion Detection and Prevention System" on 29th January, 2016.

Dr. Sourav Mukhopadhyay from Indian Institute of Technology, Kharagpur delivered a talk on "Digital Rights Managements" on 30th January, 2016.

Mr. Sourav Mitra from C-DAC Kolkata delivered a talk on "Crimes in Cyberspace - Techno-Legal Challenges" on 30th January, 2016.

Mr. Jayanta Parial, Principal Engineer - ICT & Services, C-DAC Kolkata, delivered a talk on "Cloud Security & Cloud Forensics" on 30th January, 2016.

IN CONVERSATION

WITH



Dr. Manoj Mishra

Manoj Kumar Mishra graduated as a Research Scholar from the Department in 2015. His earned his Ph.D in Computer Science on "Techniques of Compression and Encryption for Image/Video Data." He currently serves as an Assistant Professor in the Department of Computer Science at Christ University, Bangalore.

Compiled by:
Siba Mishra
Research scholar

UPCOMING SHORT TERM COURSES

NAME OF THE COURSE	COORDINATORS & CO-COORDINATORS	DURATION	VENUE
Network Protocols & their Simulation using NS-2	Dr. Chiranjeev Kumar Dr. Haider Banika	03-05 March 2016	Dhanbad
Data Storage and Processing Techniques in cloud environment	Dr. Dharavath Ramesh	28-30 March 2016	Dhanbad
Image Processing: Algorithms and Applications	Dr. Arup Kumar Pal Dr. Soumen Bag	13-17 June 2016	Dhanbad
Algorithms for Wireless Sensor Networks with Recent Trends	Prof. P. K. Jana Dr. A. Tarachand	20-24 June 2016	Dhanbad
Wireless LAN & Bluetooth Security	Prof. G. P. Biswas Dr. Hari Om Dr. Arup Kumar Pal	04-08 July 2016	Dhanbad

What were the notable changes between your pre and post Ph.D. life?

Life, before and after my PhD are two completely different affairs. The process of research makes us think differently. Before I entered research my learning and teaching methods were totally different. I would like to say that research is a way of life. It's about how we scrutinize everything precisely and with a doubt in mind. It's a good way to look at life as nothing is certain, and we make decisions after analyzing all dimensions of any aspect. I also feel elated and simultaneously humbled after this achievement. It motivates me to take life as a challenge to provide better solutions to society at large. ■



TECHSTACY

ONCETTO 2015

With innovation being the name of the game in Conetto 2015, the department of Computer Science and Engineering, very expectedly, wasn't beaten at its own game. Despite patronising just a couple of events, the department managed to carve out a niche for itself in an already event loaded fest. The events, answering to intelligently crafted names of CodeExplore and AlgoRaffle, were resounding successes with the participants, comprising mostly of enthusiastic first years. Both the events were held on October 29 and October 30, 2015.

CodeExplore

Inspired loosely by the exciting physical treasure hunts of yore, CodeExplore was a highly stylized version of a treasure hunt that tested the coding, thinking and observational skills of the participants. (Was there ever a difference between the three?) Though not emanating the sheer exhilaration and anticipation of an Indiana Jones movie or the suspense and thrill of a Sherlock Holmes novel, it certainly was a breath of fresh air given the slew of online treasure hunts that do nothing better than polishing the googling skills of unexpectedly overzealous participants. Working on a windows based environment (Not that it needs to be mentioned, given how ubiquitous it has become), the participants had to grind through five brain wracking questions of a double round event.

The first day of the event witnessed a whopping 250 participants, divided into 80 teams, taking part. Solving a question took the teams closer to the elusive final key, which could be obtained only by solving all five of them. Staying true to the fact that this was indeed a college fest, the final destination was an obscure place inside the campus itself. The first two questions were IQ based and the next three questions required implementation of coding, irrespective of platform and language.



The teams were supposed to send the answers via facebook messages to the organisers, which resulted in them immediately receiving the question for the next level. 24 teams were selected for round two, which was held on the following day and followed the same pattern, with the questions, very obviously, increasing in difficulty. And as it always happens in this unforgiving world, the quickest to the solution was declared the winner.

AlgoRaffle

The other event organized by the department in this year's edition of Conetto, AlgoRaffle certainly gave CodeExplore a run for its money. The event consisted of two rounds, testing the C/C++ programming basics and analytical skills of the participating teams. The first round was an interesting twist to the classic board game "Battleships". Instead of guessing the locations of an opponent's ships by trial and error, the

participants were required to solve blocks of codes or answer questions based on C/C++ programming to obtain the number of ship segments in a particular row or column of points, representing the ocean. Thereafter, the participants had to appropriately position the ships such that their final pattern conformed to the hints obtained after solving the questions; and a few other conditions. Both tasks had to be performed within the time frame of two hours. Needless to say, the novelty of the competition had all the participants fascinated. The second and final

rounds tested the observational and analytical prowess of the participants through ten questions. However, there was more to the competition than just solving the questions. All the teams were given 500 points initially, which had to be bid on the ten questions. If answered correctly, the product of the points bid on the question and the multiplier for the question was added to the team's score; but if team's answer was incorrect, the same number of points were deducted from their score. This added spin of gambling gave the task an element of risk, and had all the competitors hooked. ●

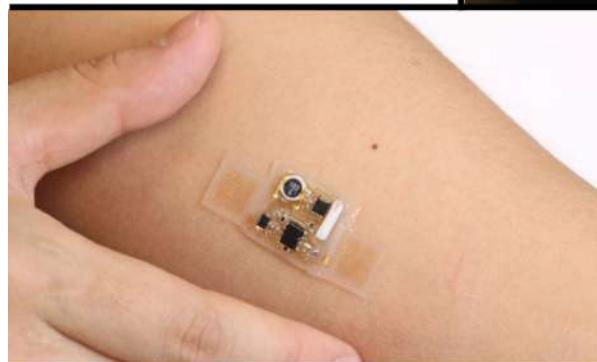


Winners Organisers Co-Ordinator

CodeExplore	Winners	Organisers	Co-Ordinator
<ol style="list-style-type: none"> Abhiman Jain, Ravibhushan Kumar Harman Kahlon, Praney Rai, Yash Sinha Ayush Kumar, Anupam Wadhva, Rajat Jaiswal 	Abhishek Dubey Yash Harbajanka Abhinav Srivastav Shubham Agarwal Abhilash Mohapatra		Bhavishya Mathur

AlgoRaffle	Winners	Organisers	Co-Ordinator
<ol style="list-style-type: none"> SurajKiran Reddy M Sravanth Reddy B Ansh Mahajan Aadil Ahmed Yash Reddy KasaPraneeth Yadav 	Digvijay Singh Saket Prasad Tarun Khandelwal Abhishek Jaiswal Sai Sumanth		K. Bhargav Teja

University of Washington (UW) researchers have developed NutriRay3D, a laser-mapping technology and smartphone app that enables users to point a smartphone at a plate of food and get an accurate count of the total calories and nutrition. A laser accessory connects to the smartphone and projects a grid of dots onto a plate or bowl and calculates the volume of food; the measurements are used to estimate the nutritional content of a particular piece of food.



Experts say embeddable devices implanted in the body that use wireless technology could be commercially available by 2023. Although there are likely to be many benefits to such technology, there also are concerns about privacy, government surveillance, and revolutionizing communication. According to a survey, this was among the 21 "tipping point" technologies that sound futuristic but are just a few years away from mass adoption.



Technologists at the Massachusetts Institute of Technology (MIT) are developing an open source, digitized food-growing system, a concept they say has the potential to retool food production to accommodate high-density urban living. The Food Computer (FC) uses robotic systems and actuated climate, energy, and plant-sensing mechanisms to create a controlled environment. The recipes for each crop, the controlling software, and sensing data would be freely circulated among FC users for tweaking and improvement.



Two separate recent experiments demonstrated the possibilities of encoding information in synthetic DNA molecules. The potential benefits of the technology include vastly greater longevity than current data storage media. Researchers believe it will soon be possible to create new hybrid storage systems thanks to the falling costs of synthetic DNA generation and sequencing.

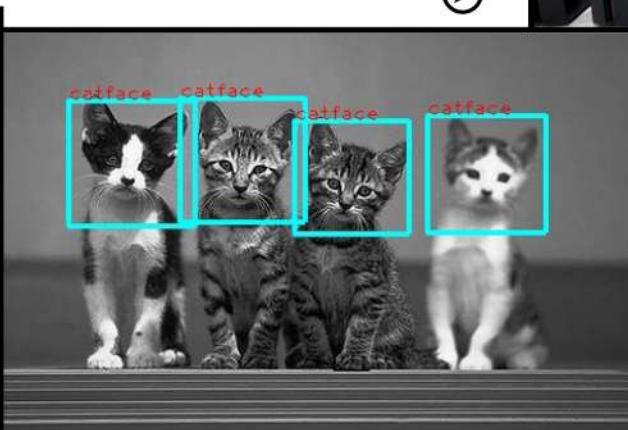


MILESTONES

TECH

Soham Satyadharma
B.Tech 2017

Umea University researcher Mina Sedaghat has developed techniques and algorithms to manage and schedule the resources in large data centres at less cost, as well as more efficiently and reliably, and with lower environmental impact. Sedaghat's research includes methods and techniques to efficiently use the servers in the data centres, so the load associated with the information generated by nearly 1 billion Internet users can be served with fewer resources.



Researchers from Microsoft and Carnegie Mellon University have combined computer vision, deep learning, and language understanding into a system that can analyse images and answer questions in the same manner as humans. The image-analysis system is based on earlier work by Microsoft on automatic photo-captioning technologies, which helps train the computer to understand the image the way a person would.





The Road Less Taken

GAME DEVELOPMENT

Urvashi Tomar
M.Tech 2017

Dhirendra Dhiru
M.Tech 2017

Video games have been an integral part of our childhood. Within most of us, even today, video games instill a feeling of childlike felicity. Be it our need for the speed or we making the clans clash, video games will always be an indispensable source of ethereal joy and entertainment.

There are a number of ways through which a video game comes into existence - using proper frameworks, means and techniques. Like almost everything else, video games are also influenced by the rapid growth of technology, with Computer Science playing an important and leading role. Playing a video game, nowadays, is like entering a completely different world, one with its own unique sights, sounds and realities. Video games have become the preferred game of choice, exerting significant social and cultural influence over children, teens and adults. Users spend most of the time of their day playing games like Gears of War, Batman, Battlefield Hardline, Borderlands 2, Mass Effect 2, God of War 3, Team Fortress 2, Bioshock Infinite etc. either on desktops or handheld devices. Today, game playing is growing manifolds, but how many of us take time to stop and think about what's involved with creating these games?

While video games have traditionally been con-

sidered a simple entertainment source, nowadays they occupy a privileged position in the entertainment market, representing a fast growing industry globally. Although India seems to be lagging behind in terms of game development, a recent study by NASSCOM revealed that the Indian gaming industry is close to \$890 million. With the increase in popularity of smartphones in the Indian market, the gaming industry is set for a steady rise as the youth is now looking at video games as not just a form of recreation, but also as a way to test their skills and talent. Video game development is a computer and mathematics-heavy field that spans the entirety of the many aspects involved in creating a video game. This includes everything from conception and the storyline to graphic design and programming. Presently, the development of video game has become technically more advanced, and the barrier to enter into this market as a developer is getting increasingly more challenging as far as the creativity and the cost is concerned. The students who study video game development become familiar both with the whole production process of creating a video game, as well as each of its specialized aspects. Many video game development programs focus on providing a robust programming foundation to complement the education in the production aspects of game development. The developers have to consider the following facts in the game

development context:-

1. A number of studies indicate that many video games are beneficial to the development of specific skills: attention, spatial concentration, problem-solving, decision-making, collaborative work, creativity, and so on.
2. To explore the relationship between architectural design elements and atmosphere, analyzing both the atmosphere produced by the architectural design and the impact of atmosphere on the design - "emphasizes critical thinking on the nature of space and its representation... and its interactivity."

3. The nature of the video games, take part in development process of behavior, mood, personality and thoughts of a player. This leads the developers to think about the psychological engagement of video games.

4. To find out and understand what motivates players to play the games and what needs the games meet.

5. Video games may be useful in equalizing individual differences in spatial skill performance, i.e., in medical science.

6. A study says that girls do not play video games with the same intensity or for durations as long as boys do. So, to find out the gaps and developing the games per the requirements of the girl's mood.

So on and so forth.

After designing the game's concept, as well as the characters and environments, the video game maker is ready for the computer work that will make his game, a reality. Software packages for making video games generally consists of three categories : 3-D games, 2-D games and role-playing games. The 3-D software is more powerful than the 2-D, and role-playing game software is different all together. Some popular video game software for 3-D includes DarkBASIC, Source Engine, Frostbite, Unreal Engine, CryEngine, Unity 3D, Leadwerks, Torque 3D, Blender, Neoaaxis, C4 Engine, ShiVa 3D.

Role-playing game making software includes the RPG Toolkit, RPG 95, 2000, 2003 and XP; and Hephæstus, among others. Video game makers use several

codes to create their games. These include C++, Python, Visual Basic and Perl, among others. Twine, Stencyl, and GameMaker are primarily tools for those who have absolutely no computer science skills, have never programmed anything in their life and think that it's beyond their ability to do so. Most of the game development tools come prepackaged with sample games, and one of the best ways to learn a new game development tool is to muck around with them, take them apart, and see how they work.

Game Development, today, has become an attractive and bright career option for the computer science graduates. Job roles in Game Development are:-

1. Animator: Responsible for the portrayal of movement and behavior within a game.

2. Assistant Producer: They work with a game's production staff to ensure the timely delivery of the product.

3. Audio Engineer: They create the soundtrack for a game, including music, sound effects, character voices and spoken instructions.

4. Creative Director: They responsible for the overall look and feel of a computer game.

5. External Producer: They ensure the successful delivery of a game, while working externally from the game development team.

6. Game Designer : Game Designers devise what a game consists of and how it plays, defining all the core elements.

7. Game Programmer : Game Programmers design and write the computer code that runs and controls a game.

8. Games Artist : Games Artists create the visual elements of a game, such as characters, scenery, objects, vehicles, surface textures and clothing.

9. Lead Artist : Lead Artists are responsible for the overall look of a game.

10. Lead Programmer : Lead Programmers lead the programming team responsible for creating all the game's computer code

11. Level Editor : Level Editors define and create interactive architecture for a seg-

ment of a game, including the landscape, buildings and objects.

12. Marketing Executive : Marketing Executives promote their employer's products or services or raise people's awareness of a message (link to National Careers Service website).

Today, video game development emerges itself as a research area and establishing as an indistinguishable field of computer science. Typical courses comprising a degree in video game development include Multiple programming foundation courses, Data Structures, Artificial Intelligence, Software Architecture, 3D Content Creation, Engine Development, Game Rules, Image Rendering, Multiple Software Engineering Courses, Structure of Game Design, Structure of Game Production, Game Pre-production, Game Networking, Physics, Calculus, Trigonometry, Linear Algebra, Public Speaking, Optimization.

Technology has advanced to path breaking levels in today's world, and to develop and create a successful video game requires the work of more than 40 people, with each person working on their specialized task. The biggest challenge that companies face today is bringing together a strong team with the right skill-set to develop a rock-solid product. Also, the development of video game is a long and tedious one, and this is an industry that is ruled by a few heavyweights. An entry into this industry is extremely difficult for a newcomer, as each of the existing companies already have a strong presence in their respective niches.

Increase in the use of internet and the consumption of digital content over various devices, are some of the reasons that would give significant growth to the gaming industry in India. Also, the evolution of games to futuristic levels, is exactly what makes this such an elite industry today.

Till one of us builds a good game, let's keep playing 'em! •



The Road Less Taken / 38

STUDENT ACTIVITIES

Ashay Sinha, B.Tech 2015 | Maheshwar Reddy Chennuru, Dual 2018

HACKFESTISM



For the first time in the history of ISM a Hackathon is to be conducted by the Computer Science and Engineering Society. A hackathon, a hacker neologism, is an event when programmers meet to do collaborative computer programming. It is to be organised by Ankit Ladhania (Final Year, CSE), Utsav Kumar (Final Year, CSE), Prakhar Rastogi (M&C Super-Final Year), Mayank Yadav (M&C Super-Final Year) and Arvind Raj Purohit (M&C Third Year) from 4 to 6 March, 2016.

In order to give a head start to the students for the hackathon event, three workshops were exclusively conducted for the students of ISM.

- On 30/1/2016, Saturday a workshop on *Introduction to Web Development* was conducted by Naman Taneja (Final Year CSE).
- 31/1/2016, Sunday a workshop on *Introduction to Android App Development* was conducted by Majeed Siddiqui (Final Year CSE).
- On the same day there was another event on *Introduction to Arduino* by Trishit Dutt.

QUIZ-WIZ 3.0



Students taking part in Quiz-Wiz

The quiz was conducted by Aditya Kaushik, Soham Satyadharma, Dev Kothari, Sai Sumanth, Pranav Thombre, Yash Goel and Chinkal. Vasudev Narayanan (B.Tech, 2018) secured first place among the audience, and was awarded a cash prize of ₹ 500. The Winners were (in order of their positions):

Gangs of Wasseypur

Nitin
Aditya Rajesh Badole
Aman Ranjan Thakur.
Abhinav Goyal

Misfits

Anupam Wadhwa
Rishabh Thukral
Bhavishya Mathur
Ashish Mohan Verma

Knighthood

Aarush Juneja
Aadil Ahmed
Kriti Singh
Mohit Chawla

SPEAK UP



An initiative of CSE Society to help students better their communication skills. Every week the session consists of debates, jam sessions, and mock interviews to help them get acquainted with the state of anxiety and stress of interviews.



ACM EVENTS

Introduction to coding:

Workshop on 05/02/2016 especially for first years aimed at helping them to get started with competitive coding and to make them interested in writing basic codes. References and guidance was also provided.

Introduction to GSoC and open source:

A workshop for 2nd and 3rd years to help them get started with Open Source contribution and provide them with a comprehensive outline of Google Summer of Code.

Ode-de-code3.0:

An Annual coding event of ACM Student Chapter

Probelm setters :
Vamsi Krishna Avvula
Rajesh Kumar Sinha

Winners were
2nd year - ashverism (Ashish Verma)
3rd year - asvikr (Ashish Kumar)
4th year - na1taneja2821 (Naman Taneja)



INDIAN SCHOOL OF MINES, DHANBAD

Demo Coding Event:

This is a subsequent meetup of coding workshop decided to be held on 08/02/2016 which offers them some assistance at getting acquainted with online coding environment, and to introduce them to basic competitive coding platforms like SPOJ, Codechef, Hackerrank etc.

Power Puff Coders:

An online coding event for girls to be held on 11/02/2016, aimed at encouraging an equal participation of women in our society.

Ode-de-Code(4.0):

Annual Coding Event of ACM chapter for all its worthy members. For the sake of a fair level of competition, all the students will be divided into 3 Divisions. This will be held on 10/02/2016.

MYSTERY OF DEATH

Raushan Roy
Dual 2019

Regardless of race, religion, time period, or geographic area every human has wondered about that one fact of life that unifies all: What is Death?

The mystery of death is so profound that, despite the millennia of religious doctrine, mythology, scientific research, and the many theories and explanations that exist on the subject, people today are more confused than ever about it. Since time immemorial, different mythologies and theologies have explained death in countless ways, ranging from total annihilation to immediate life after death in presence of god or in torment or the most praised "mukti". Some people believe that there is no such thing like death, but instead a continual rebirth after incarnation. According to some other people, supernatural powers numb our sensibilities after death and makes us invisible. Science defines death as the termination of all biological functions that sustain a living organism.

Regardless of a person's particular perception or some experimental results, the fact remains the same - death is end of life. Death is a moment before which you can adore, exploit, and

decipher this world but the post moment period marks an everlasting inactivity. That one single moment changes the way people think of you, talk about you. That moment erases your physical existence. One transforms into thoughts in that single moment. Death is an inevitable loss to you and your loved ones. It is when you do not get the feeling to feel anything. It is the final goodbye to all the livings and non-livings. Death is hail to all the things and people which this world blessed you or cursed you with. It is when, just your deeds remain.

Have you ever had the feeling when someone gestured you a final AVE? Don't you experience goosebumps thinking of loss of everything and everyone who you have known once. Then imagine the pain one has to go through while bidding goodbye to this world with a promise to never return back. How hard would he/she urge to cry when this world ruthlessly says him/her "TIMES UP".

That moment when the time falls apart, the pain grows like never before, the deadly silence roars in your ears, the luminous darkness gets into your heart, and the wind stops tickling you, death lays its icy hands on you. *



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AN INSIGHT INTO CSE

COVER BY
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MTECH 2016

