FEB
2017

AN INSIGHT INTO CSE

BUFFERED READER v3.2

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No one knows what the right algorithm is, but it gives us hope that if we can discover some crude approximation of whatever this algorithm is and implement it on a computer, that can help us make a lot of progress.

- Andrew Ng

SOCIETY

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Dr. Chiranjeev Kumar

FROM THE HOD'S DESK

It gives me immense pleasure to see that the Editorial Board has come up with the sixth edition of *BufferedReader*. The current academic year has been quite special for *BufferedReader*, with the magazine being immensely praised by readers throughout the IIT(ISM) Dhanbad campus and the alumni alike. The effort put up by the *BufferedReader* team has meant that a lot of new faces have found their interest home as a part of this magazine, fueling the team with a lot of raw energy. As the batch of 2017 hand over their final contribution for *BufferedReader*, it will be an interesting time ahead to see the rush of new blood and ideas to make the magazine reach the epitome of success.

The magazine means a lot of different things to different people, but most of all, for the students, it's a modus operandi of not restricting themselves to academics, but satiating their interests to attain overall growth. It's quite encouraging to see the excellence the students have displayed in building this magazine out of a sheer idea.

This edition starts with a dedicated piece on Neural Networks & Deep Learning. Artificial Intelligence is perhaps one field which fascinates many but ironically where it's most dangerous is the point when we think we understand it. However, that shouldn't deter us from entering the shallow waters of the technology which is slowly shaping the future.

I wish to convey my sincere thanks to the students who have brought alive this magazine with their hard work. I am also extremely indebted to my fellow faculty members for the support they have put in successful compilation of this magazine.

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!

EDITORIAL

There hasn't been a greater ordeal for mankind than to withstand the test of time. Countless civilizations, innumerable dynasties & a myriad of mortals have risen to prominence; and then fell prey to the battle yet unconquered. Yet, their legacies have been passed on to us, guised as folklores and tales of their valor. The curious power words possess has left mankind infatuated with them since their inception. Words have always been treated by mankind as a mean to escape to a different world altogether, a world which they can shape as per their fondness. We, at *BufferedReader* look to recreate the charm possessed by the words; taking the reader through an expedition unfathomed.

This edition of the *BufferedReader* gives you a short tour of the world of Artificial Intelligence (Neural Networks and Deep Learning in particular) – a place which, in our humble opinion, is just as exciting as the exploration of the 'final frontier'. The plethora of opportunities offered by AI range from the level of really exciting, such as the ability to convert black & white photos to their accurate coloured versions automatically; to the insanely alluring and stimulating idea of creating an artificial human being. Clearly, achieving the latter feat would affect our notions about life and God. As was the case with Darwin's Theory of Evolution, such a scientific breakthrough will not be without it's fair share of social and cultural controversies. There will also be the question of how the act of creating such a machine will overthrow our species as the de-facto leaders of the planet; and reduce us to mere slaves to their whims, much like the state of every other living creature today.

We have also to thank Dr. Sushila V. Maheshkar for enlightening us with the remarkable work made by researchers in the field of Image Processing in an effort to preserve our historical architectures and sites for our future generations. The current technology has also empowered us to experience sites and monuments which may now be in ruins or are immensely damaged, an idea unfathomed even a couple of decades ago.

Apart from our procedural effort of capturing every high and nigh in the technological world and the department, we have a special edition of Alumni Pen coming up for our readers, penned down by the man whom we all have to thank for this magazine. Mr. Hind K Geel, batch of 2015 and the very first Editor-in-Chief talks about his experiences as an Alumni of the department, and his journey since then. Team *BufferedReader* is also thankful to Mr. Ashay Sinha, Batch of 2016 for his constant guidance and support toward the magazine.

The response *BufferedReader* has received from the students, and the eagerness shown by them to be a part of this team, is something that has got us all up on our toes. We are all indebted to our Head of the Department, our teachers, and our beloved seniors for their invaluable guidance.

And that is all from our side. So, dear reader, you may dive into the articles by all means. Happy Reading :)

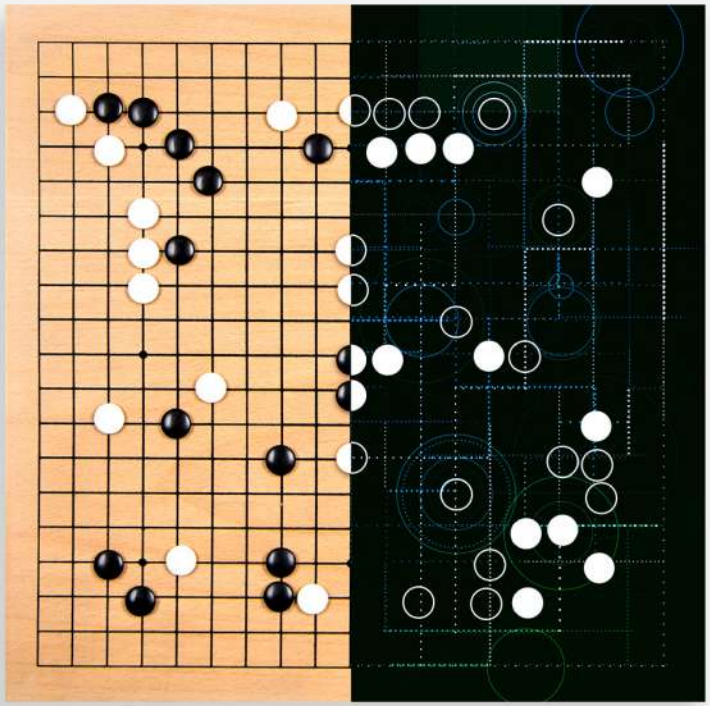


Photo credit: Google

DEEP LEARNING

Parichaya Walia | BTech 2017
Prabodh Tripathi | Dual 2018

> "I think people need to understand that deep learning is making a lot of things, behind-the-scenes, much better. Deep learning is already working in Google search, and in image search; it allows you to image search a term like "hug."
>
> **- Geoffrey Hinton**

Throughout the entire expanse of history, humans have been known to copy ideas from nature's great creations and make artificial versions of them to benefit in daily lives. Some modelled planes after birds so we could fly, some modelled helicopters after dragonflies so we could hover in the air flawlessly, whereas some have been modelling injections after mosquito proboscis for painless extraction of blood, and so on. Computers, as we all have been well aware, are also derived versions of human brain that aid us in numerous kinds of work. However in reality, typical computers come nowhere close to the computational complexity of our brain which comprises of billions of interconnected neurons to form what goes by the name of a "biological" neural network. Each individual neuron is capable of generating electrical impulses that propagate throughout the network and enable thinking and decision making. Over the years, the scientists have been making efforts to make technology smarter by creating artificial networks modelled after the biological neural network. Termed as artificial neural networks, these systems are a set of hardware and/or software, patterned after the operation of actual neurons.

Neural networks take a different approach to problem solving compared to conventional computers. Conventional computers use an algorithmic approach, i.e. they follow a set of instructions for problem solving. Unless the specific steps that the computer needs to follow are known, it cannot solve the given problem. That limits the problem solving capability of conventional computers to problems that we already understand and know how to solve. Now imagine how much more useful modern day computers would be, if they could do things that we don't exactly know how to do.

Neural networks process information in a similar way the human brain does. The network is composed of a large number of highly interconnected processing elements (known as neurons), working in parallel to solve a specific problem. Neural networks are adaptive. They learn by example, and cannot be programmed to perform a specific task. The examples need to be selected carefully, otherwise useful time is wasted, or even worse, the network might be functioning incorrectly. On the other hand, conventional computers use a cognitive approach to problem solving; i.e. the way the problem is to solved must be known and stated in small unambiguous instructions, that are then converted to a high level language program and then into machine code understandable by the computer. These machines are totally predictable. In case anything goes wrong, it would be due to a software or a hardware fault.

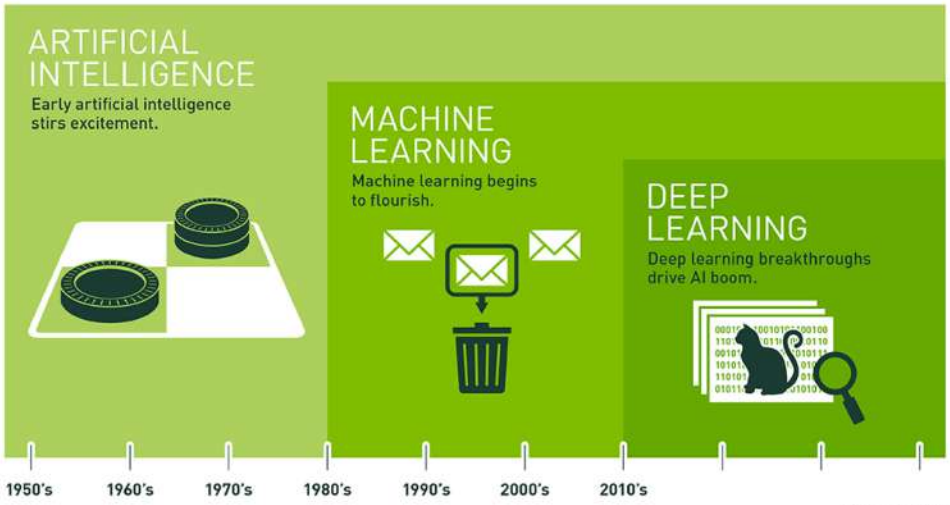


Photo credit: Nvidia

What is a Neural Network?

A perceptron takes several binary inputs and produces a single binary output. Each input has a corresponding real number expressing the importance of the respective input to the output. The neuron's output, 0 or 1, is determined by whether the weighted sum $\Sigma_i w_i x_i$ is less than or greater than some threshold value. That is how a perceptron works!

For the purpose of imagination, consider the perceptron to be a device that makes decisions by weighing up evidence. Suppose you're in the market and you like shopping. You love jeans and you try to decide whether to buy a pair or not. There might be three factors contributing to your decision making.

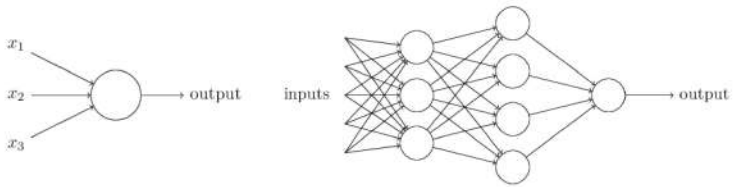
1. Is it your favorite color?
2. Is there a discount available?
3. Do you have enough money?

We can represent these three factor by corresponding binary variables x1, x2 and x3. x1 = 1, if it is your favorite color; 0 otherwise. x2 = 1, is there is a discount available; 0 otherwise. x3 = 1, if you have enough money; 0 otherwise.

Now, suppose you really like your favorite color jeans but you would never buy it if you do not have enough money. This can be done by setting w1 = 4 , w2 = 2 and w3 = 8. The large value of w3 indicates that your budget is much more important to you than your favorite color or the availability of discount. Suppose, you choose a threshold of 7 for the perceptron. With these choices, you have implemented a model which outputs 1 whenever you have enough money available and 0 otherwise. Your favorite color and availability of discount do not matter in this model. By varying the values of weights and threshold, different models can be achieved. This was a very simple example illustrating how a perceptron can weigh up different kinds of evidence in order to make decisions. The right figure illustrates what might seem a complex network of perceptrons. The first column/layer of perceptrons makes three very simple decisions, by weighing the inputs. Each of the perceptrons in second layer makes a more complex decision by weighing up the results from the first layer.

Similarly, the third layer perceptron weights the outputs of the second layer and makes even more complex decisions. This is how a multi-layer network of perceptrons can make quite complex decisions.

The problem with perceptrons is that a small change in the weights of any single perceptron in the network can sometimes cause the output of that perceptron to completely flip. This change may cause the behaviour of the rest of the network to change in some complicated way. This behaviour is undesirable in practical problem solving. This problem can be overcome by another type of artificial neuron called a sigmoid neuron. Sigmoid neurons are similar to perceptrons, but modified so that small changes in their weights cause only a small change in their output.



Left: Figure illustrating a perceptron. **Right:** Figure illustrating a network of perceptrons.

References:
Michael A. Nielsen, "Neural Networks and Deep Learning", Determination Press, 2015

Photo credit: Google

***DeepDream** is a computer vision program created by Google which uses a convolutional neural network to find and enhance features in an image; resulting in dreamlike output images.*

Photo credit: Ostagram

***Style transfer** is the technique of transferring style of an image to the contents of another image. Two inputs - a content image and a style image are analyzed by a convolutional neural network which is then used to create an output image of artistic appeal.*

Photo credit: Youtube

***Sunspring**, a short science fiction movie written entirely by AI bot called Benjamin; a recurrent neural network. It stars Thomas Middleditch, Elisabeth Grey, and Humphrey Ker as three people, namely H, H2, and C, living in a future world and eventually connecting with each other through a love triangle.*

Convolution Neural Networks

Convolutional Neural Networks are similar to ordinary Neural Networks which have learnable weights but they make an explicit assumption that the inputs are images. This makes some complex machine object recognition, image captioining, creating artworks, etc, easier. Regular Neural Nets don't scale well to full images as the number of learnable parameters (weights) increase drastically for current computers to handle. The primary purpose of Convolution in case of a ConvNet is to extract features from the input image.

Imagine a greyscale image to be a 2D (say 256×256) matrix with pixel values ranging from 0 to 255. Now, consider a comparatively smaller matrix (say 3×3) called a 'filter'. This filter is slided over the whole image while making some calculations to create a 'Feature Map'. These filters act as feature detectors from the original input image. Different values of the filter matrix will produce different Feature Maps for the same input image. In practice, a CNN learns the values of these filters on its own during the training process (some parameters need to be specified such as number of filters, filter size, etc. before the training process). The more number of filters we have, the more image features get extracted and the better our network becomes at recognizing patterns in unseen images.

Recurrent Neural Networks

An important problem in deep learning is to take into account the information of past or the computation that the network has already performed. Recurrent networks make this possible by using loops that allow information to be carried across neurons while reading some new information/input. However, modelling a RNN is a bit more complicated than other type of networks.

RNNs have been widely used with Natural Language Processing to perform linguistic magic. It is no longer impossible to generate your own Shakespearean poems that are almost indistinguishable from originals. All it requires is a large set of original Shakespeare poems and a fast computer!

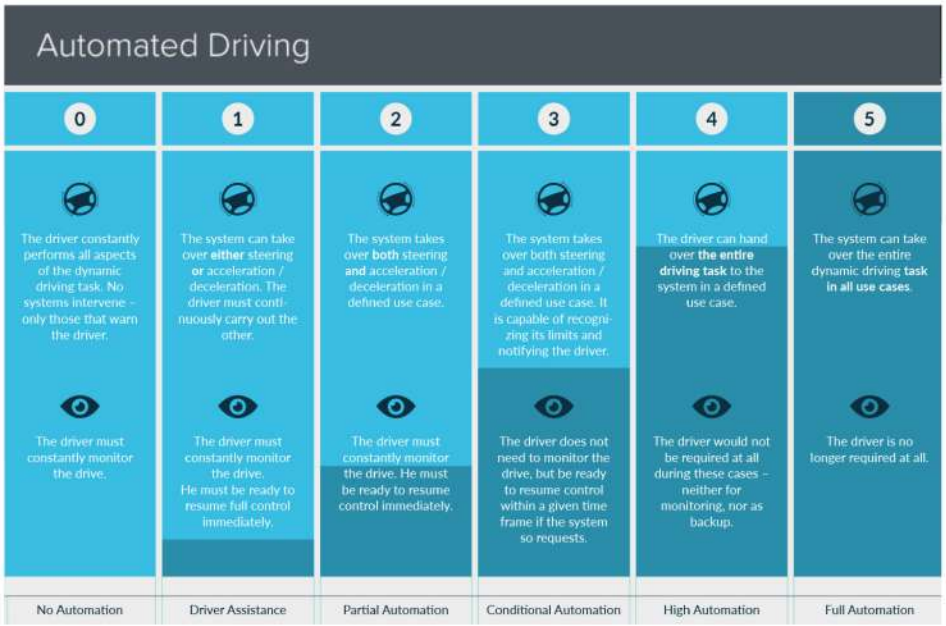


Photo credit: Allikas 2025 AD, From Driver to Driven: The Levels of Automation

***Self Driving Cars** are slowly approaching full automation. In the past, self-driving vehicles, such as the ones competing in the DARPA challenge, have relied on manually-coded algorithms to control the vehicle. With deep learning, it has now become possible for a car to navigate freely after only a thousand miles of training.*

Photo credit: Vizdoom

***Reinforcement Learning (RL)** is learning by trial-and-error, solely from rewards or punishments. Deep Reinforcement Learning has made possible for AI agents to learn their own knowledge directly from raw inputs, such as vision, without any hand-engineered features or heuristics. DeepMind's AlphaGo defeated Lee Sedol, the strongest Go player of the last decade. However, it is still difficult to create a general purpose AI which can play games, recognise faces and do other tasks that humans are good at.*

Once the problem of intelligence is solved, it can be used to solve problems in other fields - healthcare, economics, transportation; almost everything!

Limitations

Unavailability of relevent datasets in the past was a primary limitation in the breakthrough of Deep Learning. Today, the problem of face recignition can be regarded as solved; as social media sites have provided enough data for training and testing. Companies working on building self driving cars keep gathering data everyday so it can be used in near future. Data gathering is the new coal mining these days!

Another factor which limits deep learning performance is computational power. A small Neural Network can be trained on a simple CPU but training Deep Neural Nets with GBs of data is almost impossible for an average computer user. It is made possible only by GPU computing. GPUs have high processing speed and enough memory for training Deep Nets. Though for some tasks a cluster of multiple GPUs is used for weeks to get appreciable results

The Impending Revolution

Electricity revolutionized the way we live. Bulbs replaced candles in every house, a fridge appeared in every kitchen and kids started talking about TVs. Our progress in mining gave us enough materials to mass produce cars, trains, ships, etc, and also the machinery to automate the process. Our softwares now enable us to communicate with our loved ones in any part of the world instantly; also we can see their faces! We've come so far; from living in caves to flying in air over the oceans. Some of us were just beginning to think that our progress was reaching to a point of saturation and it was then Artificial Intelligence came along. The field possesses a potential to again revolutionalize the way we have been living for quite a while. It is expected that machines will soon start replacing humans at their tasks. But what about the humans? Although that day is not near but it isn't much far either. Autonomous cars have started eliminating drivers. Machines have started beating us at video games. When they cross a threshold of intelligence, they would start outperforming us at our own jobs. What will we do then? The revolution seems inevitable and all we can do is to prepare ourselves for the future. But the question remains , "How". ▪

OpenAI

***OpenAI** is a non-profit AI research company that aims to carefully promote and develop friendly AI to benefit humanity as a whole. Some scientists, such as Stephen Hawking believe that if an AI gains an ability to redesign itself at an ever-increasing rate, it could lead to human extinction. OpenAI states that AI "should be an extension of individual human wills and, in the spirit of liberty, as broadly and evenly distributed as possible...". **Elon Musk** acknowledges that "there is always some risk that in actually trying to advance (friendly) AI we may create the thing we are concerned about"; nonetheless, the best defense is "to empower as many people as possible to have AI. If everyone has AI powers, then there's not any one person or a small set of individuals who can have AI superpower."*

Photo credit: OpenAI Universe

***Universe** is an open-source platform which supports Gym, an OpenAI toolkit to support development and comparison of Reinforcement Learning algorithms. It supports teaching agents everything from walking to playing games like Pong or Go.*

UDBHAV

The Annual Day

Parichaya Walia | BTech 2017
Rishabh Mehta | BTech 2017

The Department of Computer Science and Engineering celebrated its Annual Day which goes by the name 'Udbhav' on 27th of August 2016. The event, organized by the Computer Science & Engineering Society, started by highlighting the notion that the CSE Department wouldn't have reached to the heights it has today without the constant support of the faculty, students and the alumni. The dignitaries were then called upon the stage and the lamp lightening ceremony was done. A beautiful performance of the invocation song over a soothing timbre of violin followed.

Director Prof. D. C. Panigrahi lighting the lamp.

Giving the welcome address, Dr. Chiranjeev Kumar, Head of the Department and President of the CSE Society, thanked Mr. G. Nalini Kumar (CEO of M/s Incresol and from Class of 2006) and Mr. Mohammed Rahman (Vice President, Goldman Sachs) for taking out time to be a part of the event. He addressed the gathering by reminding everyone the motto of the CSE Department, 'Let's Connect Everyone' and thanked students and the alumni for providing rationale to the statement. He then welcomed the freshers and wished them a bright future ahead. He went on to count the initiatives by the CSE Department and brought into upfront the motive of not only connecting with the current students but with the alumni too. He commended the continuous support alumni have provided to the CSE Department by becoming Lifetime and Annual members of the CSE Society. He also mentioned the success of Confluence, the annual alumni get-together organized in Bangalore, Delhi and Bangalore in the last three years, respectively. He thanked them for their readiness in supporting CSE Society in the best way possible. He brought Code-Marathon into limelight, the annual coding competition organized by the CSE Society, sponsored by the alumni of 2006 batch onwards. He also mentioned the initiatives taken by the alumni in providing the much needed industrial exposure to the current students by conducting mock interviews and also, motivated them to connect with other alumni. He also talked about the sessions taken by the CodeISM team which comprises of the final year and third year students, which fosters the spirit of competitive coding amongst the students and prepares the students in this regard. Taking note of the hiring companies' feedback, the HoD praised the efforts of the Speak-Up team for improving the soft skills of the students. Dr. Kumar referred the hard work of the editorial team of BufferedReader for the release of its fifth issue. Highlighting the need of industrial experience, he mentioned the collaboration with Amdocs, which now allows the students to work on the industrial projects directly. In the end, he gave an account of other events organized by the Department namely RAIT-2016, maiden Hack-a-thon of ISM – HackfestISM and also highlighted the excellent placement record of the CSE Department. He gave all the credits to the students for the current position of the CSE Department in the institute. He concluded his speech by the line, "You don't have to see the whole staircase, just take the first step", which indeed radiated a source of energy within all the students assembled in the auditorium.

Following the welcome address, Dr. Arup Kumar Pal, the Treasurer of the CSE Society, briefed the students about the various expenditures of the CSE Department in the last year. He further thanked all the students and alumni for their financial as well as moral support. He also cited the sponsoring of the Confluence 2016 by the alumni from Bangalore. He was followed by Dr. Rajendra Pamula, Faculty Co-sponsor, ACM-ISM Student Chapter who disseminated the audience with the various activities organized by the chapter. Finishing his speech, he appealed to the students for more participation from the Department. He was followed by Dr. Amgoth Tarachand, the Faculty Advisor of the CSE Society who announced the name for 'Alumnus of the Year Award' and introduced the recipient - Mr. G. Nalini Kumar from Class of 2006 and current CEO of M/s Incresol Software Services Private Limited. Dr. Amgoth Tarachand also highlighted the contribution of Mr. G. Nalini Kumar towards the society. Prof. D. C. Panigrahi, Director IIT (ISM) and Patron of Computer Science and Engineering Society conferred this award. In his address, Mr. G. Nalini Kumar asked the CSE Department for joint projects and entreated the Department to attract more such industry-institute alliances. He expressed delight on the fact that the institute was now an IIT. He also alluded that the institute is getting recognition in the industry due to the bright students of the Department.

Launch of BufferedReader.

The 'Certificate of Recognition' for best placement was awarded to the global conglomerate Goldman Sachs, which was received by Mr. Mohammad Rahman, Vice President, Human Capital Management at Goldman Sachs, on its behalf. The award was given to the company for its contribution towards student placements. The company offered four full time offers and seven internship offers to CSE students, out of which five students successfully secured pre-placement offers. It was conferred by Prof. D. C. Panigrahi, Director, IIT (ISM) Dhanbad.

Towards the end of the formal event of Udbhav - 2016, the honorable director addressed the gathering. Prof. Panigrahi asked the undergraduates to take initiatives and encouraged them to strive hard and work on new ideas. He said, "You need not have a good idea; you just have to have an idea. If you want to be an entrepreneur, just start. Learn to fail and learn to proceed." Addressing the future engineers, he said, "People are the only wealth and we must learn to work together."
The Chief Guest, Prof. D. C. Panigrahi, was then presented with a memento by Dr. Chiranjeev Kumar.

As an epilogue, Mr. Chennuru Maheswara Reddy, Secretary of CSE Society proposed a vote of thanks, acknowledging the efforts put forth by the HoD, the faculty, joint secretary Mr. Dev Kothari, class representatives, event coordinators, and the volunteers.

The succeeding informal events broke the oft held perception that CSE students cannot be competent in extra-curricular. Along with the melodious song performances and the skilful dance performances, what entertained the audience most was the anchoring of the event.
Photography sessions of various teams associated with the society were done to frame the memories of hard workers of the Department.

The following deserving performers were duly rewarded:

Event	Best Performer
Solo Dance (Joint Winner)	*Barasha Hazowary, Taniya Saini*
CSE Got Talent	*Adarsh Jain*
Group Dance	*Utkarsh Bhatia & Team*
Drama	*Praful Gupta & Team*
Solo Song	*Mani Shankar*
Instrumental	*Imam Khursheed*
Group Song	*Rakshit Pareek & Team*

Finally, the event concluded with the prize distribution ceremony. The meritorious students who had performed exceptionally well in the events organized by the CSE Society and the ACM ISM Student Chapter were rewarded. ▪

TECHSTACY

ONCETTO 2016

Ashish Verma | BTech 2018
Maheswara Reddy Chennuru | Dual 2018

With utmost enthusiasm and vigour, the students overwhelmingly participated in Concetto 2016, the technical fest of IIT (ISM) Dhanbad. The fest was themed 'Renaissance', which signified the reviving of learning and culture. The Computer Science and Engineering Department left no stone unturned to satiate the technological hunger that the entire college was craving for. The department conducted two mind boggling events, CodeVenture and CodeO'Riddle, that enthralled the participants and kept them engrossed throughout, in the already event loaded three-day fest. Noticing the magnanimous participation of the first year students, a separate division was created for them in both events to provide equal opportunities to the budding talents.

CodeVenture

The very first event, CodeVenture, elevated the standard of competitions in the fest to a whole new level. The competitions were conducted on fully automated, robust and flawless web applications which were developed by the organisers, and were competently constructed to deal with all types of situations. The competition comprised of three rather testing rounds, serving up to the intellectual cravings of the participants. The first round had two parts in which the first part was a tech-quiz, based on a web application to eliminate any discrepancy. The second part was a buzzer round that entranced the crowd greatly.

Winners :

Division 1.0

01	CodeByters	Mukul Anand	Pratik Kumar Sinha	Navin Kumar
02	Cyborgs	Manshul Chabbra	Rohan Jethwani	Shivam Tyagi
03	CodeBros	Manish Kumar	Pritam Patel	Mayank Kumar Modi

The real fun began in the second round which was a mind baffling coding round. One of the team members from each team was asked to write the code of a program and after just three minutes they were replaced by another team member who did not know anything about the question at all. The other team member had to analyse the previously written code, identify the problem and complete the code all alone. The event adeptly tested the adaptability, proficiency and the coding skills of the participants. The third round was a coding based treasure hunt where teams were given easy problems and their output was the key to the geographical coordinates in the campus, where they could find the answers to the riddles. The event was a grand success and the feedback from the participants was in absolute measure appreciative. ▪

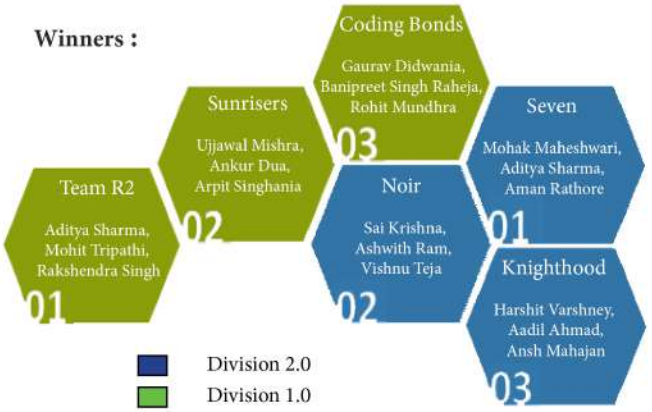
Division 2.0

01	Bond Coders	Ayush Kumar	Shubham Kumar	Sagar Bisbal
02	Team UIT-BU (UIT College Burdwan)	Ashwini Kumar	Shubhraj Prasad Singh	Saket Kumar Das
03	Razzers	Abhishek Bansal	Harsh Mohanka	Anmol Soy

CodeO'Riddle

The second event, CodeO'Riddle, appositely justified its name when it befuddled the participants with its coding questions and riddles. Massive participation was witnessed in this event from all the years, especially the first year. This event assessed one's faculties for decipherment, adroitness in coding, and deftness in exploring. The event encapsulated six treasure hunts along with multiple coding rounds like Segmentation Fault, Aptitude Test and Competitive Coding. Each team had 3 members, one engaged on the workstation for coding, while others were busy rummaging through the college in an attempt to decipher the riddles, and elicit the solution. Getting the key to any of them promoted the participants to the next round.

Winners :



The participants found coding snippets quite challenging, however the location riddles were comparatively easy to solve.

Eventually, the event concluded amazingly with delightful feedback from the participants. Winners got a cash prize along with a certificate by Dr. Chiranjeev Kumar, Hon'ble HoD of the CSE Department. He greeted heartfelt wishes to winners and motivated students to continue such events every year in Concetto. ▪

ALUMNI PEN

Vaasudev Narayanan | BTech 2018
Rishabh Mehta | BTech 2017
Shantanu Mishra | BTech 2017

TeamBR: How does it feel to be interviewed by the magazine of which you were such an integral part?

Hind: Overwhelmed and surprised. Overwhelmed because, truly, it is an honour to be interviewed for *BufferedReader*. I know, from my days of working for the magazine, that the alumni pool of CSEians has some remarkable people who have achieved great heights in their professional life. And, hence the surprise.

TeamBR: So, please tell us how has your life since ISM been?

Hind: As with life in general, there have been good days and bad days. Life outside college is very different, in all the senses including but not at all limited to computer science. Technical learnings have been the high point and realization of prevailing objectification of everything, barring none, in the corporate culture has been the low point.

TeamBR: As an alumnus do you feel that the education imparted to you over the last four years really helped? And do you believe there is anything lacking?

Hind: Did the education help? Yes of course. Part of the reason I am working in a Computer Networking company today is courtesy of Dr. Chiranjeev Kumar and Dr. Sukomal Pal who were beyond effective in piquing my interest for Computer Networks and Operating Systems, the two terms that comprehensively define what Arista does. And hence the knowledge gained helps, it truly does.

Is that education enough? No. Something that I would love for students to learn and understand is software development beyond single-script softwares/logics that we get so used to making during the under-graduation. In most companies, and I believe Arista is a good enough example for me to speak on everyone's part, the code base is huge. Although these people don't really expect the newly grads to immediately get in the groove of the business, but having an idea of how software development happens on a "larger" scale would definitely help.

TeamBR: Can you tell us something that you wish you would have done better when you were in college?

Hind: As before, understanding the importance of being a team-player in software development rather than being a lone-wolf. I realize working here, although necessarily reiterating what Software Managment must have taught you, that as your code swells up, the time it takes to manage this code swells up too and a normal software engineer spends far more time in managing the code or writing enough tests to manage that code than actually writing product code.

Other than that, "better in college" is a misleading question. There are always hundreds of things that could be done better. This is something that I think is best defined by negation, and how I like to, now, articulate it is - When in college, do something, do anything, attend classes, do practicals, go for treks, take part in sports, be a part of a family, a club, stand up and speak, listen, understand and learn, but don't just DON'T ever vegetate in your hostel room. Two years down the line, stupid attempts failing miserably are reminisced with far more cherish than time spent binge-watching a TV series alone in my hostel room whose story is lost to me today.

TeamBR: What do you think you as an alumnus can do to help the college now?

Hind: Although the internet has shrunk the globe far too much but I believe working in the industry we, alumni, have, for a good part of our everyday, a close exposure to our respective industries and technologies that are being employed to bring those to reality. And this helps us put a far more pragmatic picture of these than whatever internet and textbooks would tell you. Moreover, since in the initial days of our professional life, I see many of us switching between jobs looking for that right job, alumni would be great at informing the students what's hot and what's not in the market, right from what the job expects from you and what you should expect from it as well.

TeamBR: Being an undergraduate, what is your take on long term working in the corporate world? Do you feel that further studies are a must?

Hind: Long term working as an undergraduate isn't the best prospect in my opinion. And even though the experience of working in industry speaks a lot about the quality of an individual, there's a reason a post-graduate is given more respect than a graduate in the industry. Because technical talent doesn't show on face, it doesn't show right away in the words you speak. The qualifications earned in educational institutions hold value. I am not saying having a coveted degree from a respected college gets you in Googles or Facebooks, but they do get you noticed far more than you'd have without them.
Coming back to the question, Are further studies a must? I wouldn't have answered a question with another if there was a better way around.

TeamBR: So, do you wish to learn and study more of the your discipline of education?

Hind: Being a graduate doesn't necessarily mean you have to be a postgraduate as well. But I must say, postgraduation opens door to more demanding technical problems of the industry. The industry respects your qualifications. ▪

Hind K. Geel

Hind Kishore Geel is a graduate of B.Tech Class of 2015. He currently works at Arista Networks Inc. in the capacity of a Software Engineer. Hind is an avid traveller and has a knack for outdoor sports, specially skateboarding. During his free time, Hind plays music, reads books and writes poetry.

PLACEMENTS 2017

OVERVIEW

Late September

Adobe gave offers to 2 undergraduates this year.

@WalmartLabs
Walmart Labs made two full time offers and for the first time offered summer internships to six pre-final year students.

Arista Networks hired a total of 7 students, offering a package of 16.8 LPA and gave internship offers to 3 pre-final year students.

With the company offering the highest on campus package of 27 LPA, Amazon IDC made 3 full time offers and also took 3 interns.

The highest recruiter this year, Samsung R&D hired a total of 22 students with 10 of them being pre-placed. They also took a record 38 interns.

Investment banking company Goldman Sachs made 6 full-time offers (5 PPO's) this year and 5 interns.

The online travel company, MakeMyTrip.com offered placement to 1 candidate.

3 pre-placement offers came from Microsoft this year alongwith 3 internship offers.

Early October

Ramco Systems, the Indian software products and services provider, hired a student of our department. It offered a package of 13 LPA.

Sandvine Technologies Pvt. Ltd., the Canada based networking hardware and software company, offered a job to one candidate.

The eight year old restaurant search and discovery service startup Zomato hired three of our students.

Coming on the campus for the first time Commvault Systems hired 1 student offering a package of 14.81 LPA.

Works Applications, the Japan based enterprise software company gave offer to one student with a whopping package of 36 LPA (6 Million JPY).

The product development company, Amdocs after recently signing an MoU with the Department of CSE, IIT(ISM), Dhanbad offered a job to 1 student.

Late October

Visiting for the first time, Smartprix made a delightfull offer of 22 LPA to 1 of the students.

After giving a pre-placement offer to one of the students, Google hired one more undergraduate.

BlackNGreen Mobile Solutions made an offer of 6.5 LPA to 1 of the students.

CGI Information Systems offered 2 students a package of 6.5 LPA.

Tesco made a surprise visit this year and hired 2 candidates.

Offering a package of 7.4 LPA Zemoso Tecnologies hired 3 students.

Droom Tecchnology Pvt. Ltd. hired 2 students with a decent package of 7.75 LPA.

Burning Glass Technologies & Droom Technologies made 2 offers this year.

November

Wipro, the mass-recruiter of engineers across the country, hired 7 undergrads.

Offering a package of 11 LPA Sling Media hired two students.

2 students were offered a job in the online marketing company, ID Arena.

Arriving at the end of November Sapient Nitro grabbed 1 undergrad.

December & January

Techracers offered placement to a solitary candidate.

Arriving early December, MAQ software made a total of 2 offers.

Recruiting a little bigger this time, Capgemini hired 4 candidates.

Regular recruiter SRI-Noida made a late appearance and offered jobs to 3 candidates.

#The data is till January, 2017 and Placements are still going on.

STATISTICS

- Batch Strength : 115
- Total Offers : 92
- 21 Pre-Placement Offers
- 77.39% Placed
- 30 Companies Visited
- Average Salary : 13.70 LPA

DIGITAL IMAGING

FOR CULTURAL HERITAGE PRESERVATION

Dr Sushila Maheshkar | Assistant Professor

The Charter on the Preservation of Digital Heritage of UNESCO defines digital heritage as embracing "cultural, educational, scientific and administrative resources, as well as technical, legal, medical and other kinds of information created digitally, or converted into digital form from existing analogue resources".

Cultural heritage is not just the traces of past society and past times, but also includes the evidence of the present ones, which needs to be preserved for our progeny as well. The digital technologies offer modern tools for cultural heritage preservation and also play a crucial role for key issues such as providing access, interaction and sharing knowledge.

Cultural Heritage can be distinguished into three types:

1. Built Environment (Buildings, Townscapes, Archaeological remains)
2. Natural Environment (Rural landscapes, Coasts, Agricultural heritage)
3. Artefacts (Books & Documents, Objects & Pictures)

Role of Digital Image Processing

The use of image processing techniques for the analysis, diagnosis, and restoration of artworks remains a rare practice. However. recently there has been an interest in acquiring and processing digital data of artworks. The field of digital processing for cultural heritage encompasses a variety of topics:

1. High resolution 2D and 3D digital capture and rendering of artworks.
2. Digital Restoration, Enhancement, and Recognition of artworks.
3. Classification of features, structures and content in cultural heritage visual data.
4. Creation of large-scale multimedia databases.

Some of the major applications of image processing in preservation of cultural heritage are discussed briefly.

1. Cultural Heritage Image Acquisition

Archiving, retrieval and dissemination closely followed the exact replication of artworks being the biggest benefactor from the digital format. Most of the museums, archives, and libraries are engaged in direct digital image capture of cultural heritage.

Depending on the application's requirements, the image acquisition devices use passive or active detection schemes and several kinds of sensors and radiation sources (lasers, LEOs, X-ray tubes). However, most of the current developments are concentrated on processing the visible and near IR range images.

2. Watermarking for Authentication and Compression of Cultural Heritage Images

Hard Authentication techniques often falsely identify data passed through diverse distribution chains and content-preserving operations such as compression, transcoding etc as inaccurate. Recently there has been a movement towards Soft-Authentication schemes which distinguish content-preserving processing from unlawful content-changing manipulations. One such tool-set is semi-fragile digital watermarking which provides authentication and compression of Cultural Heritage Images.

3. Virtual Restoration of Artworks

Image-processing techniques can either be used as a guide to the actual restoration of the artwork (computer-guided restoration), or they can produce a digitally restored version of the work (virtual restoration). However, on a virtual representation of the artwork, many more options are possible.

1. The crack removal is a straightforward application which proved to improve the readability of the image to a significant extent.
2. Virtual cleaning is another application, helping in the complicated removal task of varnish from the paintings which make paintings illegible as they age.
3. The virtual recomposition of fragments of a painting, joining parts of paintings which are now hosted in different museums or are lost but reproduced in some old postcard.

4. Cultural Heritage Content Fruition

The birth of virtual art gallery and museums enable artists to showcase their masterpieces globally. Digital reproductions of artworks belong to the legal owner, similar to real artworks. But these images are at risk of illicit use, consequently arising the need of a simple yet effective way to counter it. Digital watermarking is one such possibility.

Preservation Challenges For Digital Collections

The Library faces challenges in digital preservation that are widely recognized and widespread. They include the following:

Fragile storage media: Digital materials are especially vulnerable to loss and deterioration owing to being stored on fragile magnetic and optical media susceptible to exposure to heat, humidity, airborne contaminants or man-made errors.

Technology obsolescence: Digital materials become unreadable and inaccessible if the playback devices or the digital to human- readable format translator become obsolete.

Legal questions surrounding copying and access: Libraries, archives, and other cultural institutions have limited rights to copy digital information for preservation purposes, to reformat information to remain accessible by current technology, and to provide public access.

Indian Digital Heritage

In 1972, the General Conference of UNESCO adopted a resolution, creating a 'Convention concerning the protection of the World Cultural and Natural Heritage'. The main objectives were to enlist Sites and Monuments from the member countries which are of exceptional interest and universal value, and to preserve these universal treasures for future generations.

There are 32 World Heritage Properties in India, 25 of which are Cultural Properties and 7 are Natural Properties.

Recent Application in India

Indian Digital Heritage Project is a unique initiative of the Department of Science & Technology (DST), Government of India, supporting collaborative projects between researchers in the areas of Technology and Humanities for the digital documentation and interpretation of our heritage. The project highlights the art, architecture and cultural legacy of the world heritage site of Hampi in Karnataka, the medieval capital of the Vijayanagara dynasty.

In a first of its kind project, a team of experts from premier institutions like IIT made a 3D imagery of UNESCO World Heritage Site Hampi, enabling people to experience the rich cultural heritage of the ancient city in Karnataka. A mobile app has also been developed, the users of which can see the now ruined original Hampi Structures.

FUTURE : Smart Cities in India

In the age of experience, digital heritage is a competitive advantage for cities. There is tremendous potential in India to build an effective ecosystem to enable its expanding urban areas to become smart and sustainable by using digital technology.

Cities are the most complex objects that man created. They can't be treated simply as products. This is why, in the world of tomorrow, no city will be designed or managed without the help of virtual worlds.

This breakthrough is set to revolutionize all aspects of the way cities are developed and managed, including urban services, infrastructure, security and natural disaster mitigation. Dynamic digital models of cities Cmake it possible to simulate scenarios and create experiences in order to find sustainable solutions to all these challenges.

The main obstacle to the application of image processing technologies to the art field is represented by a cultural distance between technical researchers and researchers belonging to the humanistic area. In spite of these difficulties, there is a clear demand for new computational tools to help know more about works of art. Hence the application of image processing to the study of artworks will be one of the most interesting image processing research areas in the coming years. ▪

Picture Credits: Archaeological Survey of India

Above: Ruins of Temple
Below: Replica of Temple

WHAT THEY SAID

Pranav Thombre | Dual 2019
Ashish Verma | BTech 2018

Q. How was your experience recruiting from IIT(ISM) Dhanbad?

The placement team was very cooperative. The recruitment process was conducted smoothly and we didn't face any hassles in our time here.

Q. What was your general impression of the candidates?

We were mainly looking at recruiting students possessing a strong foundation in Computer Science. We expected them to possess the skills that would enable them to build up a project from scratch. Keeping these expectations in mind we weren't too impressed with the candidates here. The few candidates that matched our expectations were selected to join our organization. We encourage the students in the future to fortify their fundamentals, as these are skills which are required in the industry these days.

Q. How is the work culture at Tesco?

Tesco has a fantastic work culture. In today's world, it is common for people to transition from one company to another after a period of a few years. However our employees after joining do not tend to leave. We have pretty flexible timings, and we always ensure that our employees are happy.

Q. Any suggestions you would like to give to the college and to the students?

We would encourage students to work on their knowledge of basic computer science, so that they can tackle our recruitment procedure. Having a strong grasp of the basic concepts of computer science is a policy that we actively advocate. Apart from that we would also request the college to invite us earlier in the placement procedure, so that we can interview and select more students. ▪

TESCO

SAMSUNG

Q. How did you find the institute? What was your first impression about the college?

IIT(ISM) has shown significant progress in the last few years. The name ISM leads us to assume that the college is predominant in Earth sciences. However, it's surprising that today, a large number of alumni of the institute are present at prestigious positions in various companies with 10 to 15 years of experience and they pursued degree in CSE and ECE branches. IIT tag simply enhances the already elite position the institute enjoys in the country.

Q. What qualities do you seek in candidates?

Samsung covers a vast area in technology. As a research institute, we are interested in fields pertaining to Internet of Things, Image Processing, Deep Learning, etc. We would like the candidates to be familiar in these areas. Also the syllabus which is currently followed in the IITs is outdated given the rapid progress in the IT sector. The students themselves must acquire skills from sources other than the curriculum such as online resources like Coursera, eDX, etc.

Q. What roles does Samsung Noida offer to candidates, especially from IIT(ISM)?

Generally there is no discrimination on the basis of college, and all new recruits are given equal opportunities. However, we do give the students from the older IITs good projects, better areas of research, as they are a resource to us. Also, if there is any particular interest of the candidate which was highlighted during the interviews, we do take that into consideration in assigning roles.

Q. Any feedback that you would like to provide to us.

You need to work hard to justify the IIT tag. Students must not lose the zeal to endeavour and restrict their talent. They should work on their communication skills as those are a must. You cannot present yourselves if you're not sound in them. You should also conduct mock interviews as they do in other IITs, which would eliminate the nervousness factor. ▪

Q. How did you find the institute?

It's very good; at par with the other IITs. Everything, from the administration's support to the provision of necessary facilities was top-drawer. I am very pleased to see that.

Q. What qualities does Arista Networks look for in a prospective candidate?

This is important. First and foremost, they should not only be very skilled at coding; they should also be competent at Data Structures and Algorithms. Additionally, Arista wants the recruits to be capable of designing data structures suitable for any given set of requirements. So the interviewer may present the candidate with a problem statement, and then ask him/her to design a data structure which takes into consideration all the given constraints, complexities, memory requirements, etc. and come up with a production level code of the interface. LRU Cache, heaps, and binary search trees (BSTs) have been asked frequently. Furthermore, providing a correct solution to the problem is not enough; it must necessarily be the most efficient solution available.

Q. Did the candidates meet the expectations?

The candidates appearing for the full-time positions, most of whom had interned at Flipkart last year, met our expectations. They were terrific. Unfortunately, most of the internship candidates were not so good and it seemed like they have just memorised the answers without knowing the fundamentals. So we could not select as many candidates as we aimed to.

Q. Lastly, are you satisfied by the institute's functioning and support to the overall placement procedure?

Yes, we are very happy with the administration. We were provided with a form to specify all our logistical requirements after which everything was taken care of. The food too was very good. Overall, we are content with the administration on that front. ▪

ARISTA

AMAZON

Q. How did you find the college?

The college, for sure has a different vibe than a few years back. Many changes are noticeable. I'm quite astounded at the development that has occurred since I passed out. From talent to infrastructure and services, everything seems to have taken a turn for the better. These changes have been really pleasing to see.

Q. What does Amazon seek in the students it wants to hire for internships as well as full time hiring?

We don't expect the candidates to know everything in the interview. We focus more on testing their approach. There have been incidences where the candidate knows the answer, but when asked to write the code he/she commits a common mistake, like omitting the corner test cases. We expect that the candidate should possess adequate aptitude and coding skills. A production level code is required from every candidate, which can handle every test case that we run. In a nutshell, the code has to be flawless.

Q. How many students do you wish to hire for internships and for a full time role?

We don't have any specific number in mind as such. We'll hire all those students who clear the bar that we set. For interns, we had two technical rounds plus one coding round and an MCQ round, which were conducted for shortlisting. We look for those candidates who clear the threshold. There have been scenarios where 24 to 26 candidates were selected for the interview, but only 4 or 5 students could make it through the interview round. If we get six or more than six candidates selected in the final round then that campus is extremely good because the numbers haven't yet gone that high for full time hiring.

Q. How did you like the hospitality service of the college?

The hospitality services that were provided by the college were excellent. All our requirements were fulfilled promptly and we did not face any specific problems in this regard. ▪

DEPARTMENTAL HIGHLIGHTS

Shantanu Mishra | BTech 2017
Nishit Dabi | BTech 2018

Organised Events

Short Term Courses

The Department organized three short-term courses to enhance the knowledge of students in computer networking and strengthening their mathematical base.

➢Hands-on session on MONOSEK - Real Time Network Packet Processing & Network Session Analysis Tool during 14-18 Sept 2016.

➢Mathematics of Cryptography with Image and Bluetooth Security Applications during 19-23 Dec 2016.

➢Recent Trends in Wireless Sensor Networks and IoTs during 21-25 Jan 2017.

Guest Lectures

➢A one day workshop on "Smart Grids" was conducted by Mr. Subhajit Ghosh on 16 Sept, 2016 (Friday) from 11.00 AM to 12.30 PM at the Seminar Hall of the Management Studies Department.

➢Dr. Sudip Mishra was the guest lecturer in the short-term course on "Recent Trends in Wireless Sensor Networks and Internet of Things" which was conducted from 21 to 25 of January 2017.

Vishwakarma Puja

Proposed Events

Short Term Courses

The Proposals for five short-term courses have been put forth

➢Data Mining and its Applications during 27 February to 3 March 2017.

➢Digital Imaging: Techniques and Applications during 4 - 8 April 2017.

➢Conceptual Big Data during 7 - 9 June 2017.

➢Network Protocols and its Simulation using NS2 and NS3 simulators during 20 - 24 June 2017.

➢Coding Theory and Cryptography: Fundamentals and Applications during 26 - 30 June 2017.

Workshops

➢A workshop on Communications and Multimedia Security is going to be held during 09th and 10th of Feb 2017.

Conferences

➢4th International Conference on Recent Advances in Information Technology (RAIT- 2018) will be held from 15th to 17th March 2018. For more details, visit the RAIT website http://www.rait.co.in

Teachers Day Celebration

Ph.D Awarded

➢Dr. Suneet Kumer Gupta on "DESIGN OF ENERGY EFFICIENT ROUTING FOR WIRELESS SENSOR NETWORKS".

➢Dr. Shipra Kumari on "STUDY AND DEVELOPMENT OF REMOTE USER LOGIN AUTHENTICATION SCHEMES".

➢Dr. Mohammad Nadeem on "DESIGNING SOFT COMPUTING TECHNIQUES FOR PARAMETER ESTIMATION AND OPTIMIZATION FOR PELLETIZATION".

➢Dr. A.C.S. Rao on "ANALYSIS AND SYNTHESIS OF PUBLIC BIOINFORMATICS DATA USING DATA MINING AND MACHINE LEARNING TECHNIQUES".

➢Dr. Shweta R. Malwe on "DESIGN OF LAYER AND CROSS LAYER PROTOCOLS FOR WIRELESS AD HOC NETWORKS".

Mr. Sawrav Roy (M.Tech 2013) has been awarded the AFT India Awards – 2016 by the Director of Amazon Fulfilment Technologies (AFT) for solving complex problems in a relatively simpler way

Higher Studies in Foreign University

➢ Mr. Kalyan Raman (2009) took admission at University of Washington.

➢Mr. Piyush Banginwar (2012) took admission at Stony Brook University.

➢ Ms. Rupal Jain (2013) took admission at Technische Universität München - Informatik, Germany.

➢ Mr. Shubham Jain (2013) took admission at Texas A&M University.

➢ Ms. Bharti Goel (2015) took admission at University of South Florida.

➢ Mr. Sagnik Das (2016) took admission at State University of New York at Stony Brook.

➢ Ms. Shikha Tripathi (2016) took admission at University of Houston, Texas.

➢ Mr. Shiva Ganga Chennu (2016) took admission at University of Texas at Dallas.

➢ Ms. Poonam Beniwal (2016) took admission at University of Houston, Texas.

Some Other Achievements

➢ A Memorandum of Understanding (MoU) was signed between the Department and Amdocs – a software and services provider.

➢ A total of 2 teams qualified for ACM ICPC India finals from the institution among 86 teams selected from all over India.

➢ One of our Dual Degree students Mr. Pranav Thombre (2019) got selected for the DAAD internship in 2017-18 session.

➢Rishabh Mehta (2017) secured first rank in stand-up comedy at Inter IIT Cultural Fest held at IIT Bombay in December 2016.

IT'S ALL ON ME

Tanishk Kithannae | Dual 2020

I may have worn a miniskirt,
Or perhaps a saree
I may have worn a burqa for crying out loud
But ultimately, it's all on me
Because I was inappropriately dressed
At least there was no discrimination here

I could've been in the fields
Or enjoying myself at a party
I could have been within the confines of my house
But it's all on me
Because I was at the wrong place

It could've been a night, dark and cold
Or perhaps a day, bright and sunny
I could've been strolling in the evening
But it's all on me
Because it was the wrong time

I could've been alone or in a group
But forgive me for not being able to break free
When multiple bruisers pinned me down
And had their fill
Even though I honestly can't see how a man would've
Fared better when subjected to such vile physicality
Yet, I concede it's all on me
Because I was weak

Maybe I've never even hugged a man
But I was most certainly up for the intimacy
For I, driven by lust, was desirous of it
But it's fine, the fault is mine, really
After all, it's all on me
Because I was asking for it

I may have been the most shy and secretive person
So why should I mind it when everyone
Blatantly violated my privacy?
First when my antagonists assaulted me

Next, when the men of 'justice' had to
Carry out their inquest
When the doctors had to reconfirm the veracity
Of my 'questionable' claims
When the media found it more mature
To subject me to an interview
Than offer me their sympathy
How could it not be on me?
I am, after all, an open book

I may have been an introvert, or an extrovert
Or perhaps an ambi
But today, even the few people I knew to be friends
Have turned to nothing more than uncomfortable stares
Funny part is, I'm being judged for the actions of social outcasts
Based on act I was involuntarily a part of
Society made its final conclusions on who I was
And what my character consisted of
But it's all on me
For it was in my nature to be raped

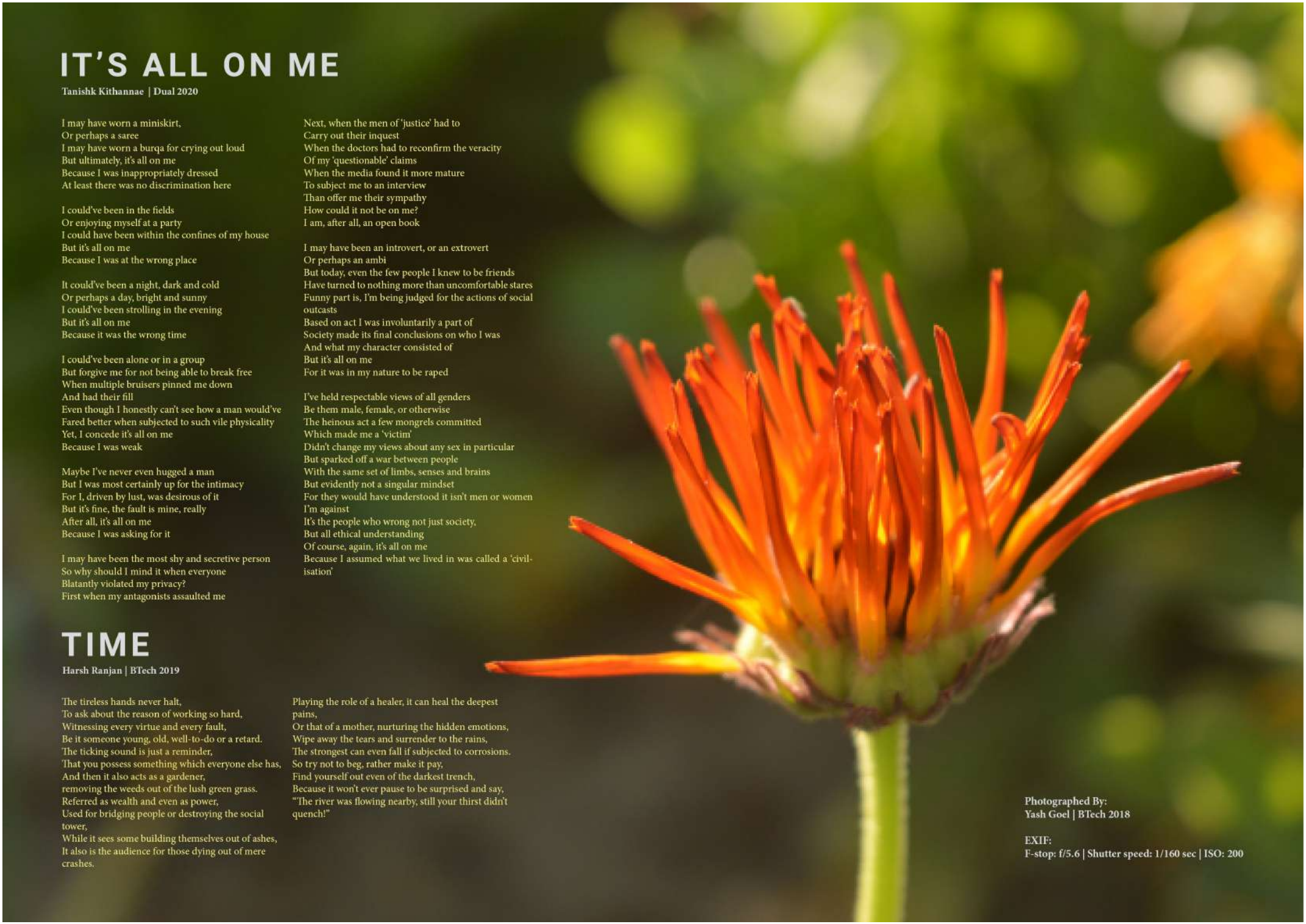
I've held respectable views of all genders
Be them male, female, or otherwise
The heinous act a few mongrels committed
Which made me a 'victim'
Didn't change my views about any sex in particular
But sparked off a war between people
With the same set of limbs, senses and brains
But evidently not a singular mindset
For they would have understood it isn't men or women
I'm against
It's the people who wrong not just society,
But all ethical understanding
Of course, again, it's all on me
Because I assumed what we lived in was called a 'civilisation'

TIME

Harsh Ranjan | BTech 2019

The tireless hands never halt,
To ask about the reason of working so hard,
Witnessing every virtue and every fault,
Be it someone young, old, well-to-do or a retard.
The ticking sound is just a reminder,
That you possess something which everyone else has,
And then it also acts as a gardener,
removing the weeds out of the lush green grass.
Referred as wealth and even as power,
Used for bridging people or destroying the social tower,
While it sees some building themselves out of ashes,
It also is the audience for those dying out of mere crashes.

Playing the role of a healer, it can heal the deepest pains,
Or that of a mother, nurturing the hidden emotions,
Wipe away the tears and surrender to the rains,
The strongest can even fall if subjected to corrosions.
So try not to beg, rather make it pay,
Find yourself out even of the darkest trench,
Because it won't ever pause to be surprised and say,
"The river was flowing nearby, still your thirst didn't quench!"



Photographed By:
Yash Goel | BTech 2018

EXIF:
F-stop: f/5.6 | Shutter speed: 1/160 sec | ISO: 200

WHAT WE SAID

Soham Satyadharma | BTech 2018
Aditya Thakre | BTech 2019

Read through as the Final years and Interns take you through their journey of gritty hardwork, right upto the day when it all matters.

WALMART LABS

I had no idea about CSE when I cleared JEE Advanced. I couldn't even operate a computer properly. People advised me to opt for Mechanical or Electrical Engineering but by virtue of the rebellious nature I bear, I went for CSE.The aspects that interviewers emphasize the most on is your confidence. Besides this, the interviewers see if you are at par with the current technologies. Your activities in the last two-three years of college ranging from co-curriculars to participation in social activities also help. He/ she also tests you on leadership skills, teamwork skills and so on.

Your ultimate goal fluctuates from time to time. A year ago, it was about getting a good job and now it's different. As of now, I think after spending some time in the industrial sector, I will be joining the academic field or do some research work.

- Abhishek Tiwari

ARISTA

Good salary packages and interest in computers drove me to pursue CSE. For a majority of companies, GPA doesn't matter much, but for companies such as Arista it is indeed an important factor. Many times, your GPA decides whether you will be selected or not. An HR tries to judge whether you will stay with the company or not. For example, if you have a good GPA, you might want to leave the job and continue with further studies. That's essentially a loss to them. Secondly, they see if your aims match with the aims of the company. In my experience, the HR interview can be rounded off with projects related discussion alone. The knowledge you have can't get its full worth if you're unable to express it.As far as my future plans are concerned, I will pursue an MBA once I've worked 2-3 years for the company.

- Rajat Bajaj

MICROSOFT

I opted for Information Practices in class 11. The subject interested me, and taking CSE in college was not a difficult choice. Taking part in various coding contests right from the first year certainly helped.

Maintaining a decent, if not exceptional GPA is necessary; as you may not be able to take the coding round otherwise. Projects are significant as they are supposed to be your strong point. Also, it's a plus to have a project related to something that the company is working on. HRs expect the students to have a genuine interest in the company.

I want to work in the company for the next 4-5 years at least. I am particularly interested in search engines and will try to work in the Bing team sometime in the future.

- Shantanu Mishra

TESCO

The seventeen year old me was fascinated by computers and wanted to explore that field. In the same year, I cleared JEE Advanced. I think that's the reason I decided to pursue CSE.

A low GPA means it's difficult to get placed in the initial days of the placement season but that shouldn't demotivate you. Not all companies look for a high GPA. It's mostly your talent and presence in the interview that gets you the job. There are sides to an interview other than the technical interrogations. Your personality as a whole is tested there. How you solve day to day problems is also judged. My HR round went for around one and a half hours. One of the questions that the HR asked happened to be a hypothetical situation problem. He asked me what I would do if all my team members left. Such type of questions often form the core of an HR interview. These interviews intend to examine your problem solving skills, without which it's hard to survive in the company for long.

I believe real life projects grant you more credit than others. I've regularly been part of many such projects; one of them being Sadda Campus, a food delivery start-up. Soft skills also form an important part of the interview. One aspect of soft skills that people often ignore are listening skills. I've seen cases where the interviewer wouldn't care to repeat the question once asked. Also, no matter what happens, you must never lose confidence.

- Ronak Baid

DAAD WISE

The DAAD WISE scholarship programme targets Indian students pursuing a degree in the fields of science and engineering who wish to do an internship at a German University. This program is highly competitive and only 150 students are awarded the scholarship from thousands of applicants. My interest in Machine Learning, and my intention of pursuing a research internship abroad this summer prompted me to apply for this program.

The application procedure was through a web portal, and it required several documents, the most important of which is an invitation from a German professor who is willing to guide you during the summer. The search for a professor was a long and arduous one, and it was after sending close to a 100 mails, that I finally got a response. I was interviewd by Dr. Thomas Martinetz, and after we agreed on a particular project I was eventually sent the invitation letter. The process of procuring an invitation letter took close to a month to complete. The remaining procedure was relatively straightforward, it required me to write an SOP, and to upload the relevant documents onto the portal.

The DAAD WISE scholarship will cover all my expenses during my trip to Germany this summer, and will also provide a daily stipend. The duration of this internship is from May to mid-July. I will be working with Dr. Martinetz, at Universitat Lubeck on a project pertaining to "Pattern recognition using deep learning to automate disease diagnosis".

- Pranav Thombre

WALMART LABS

One should always be able to justify whatever he writes in his resume. One must also have a sound knowledge about the company. GPA only helps you cross the threshold the company sets. Once crossed, it doesn't really matter.

Projects are important; so important that without them you don't really have much to talk about. Besides your knowledge and technical skills, soft skills matter a lot. A candidate who can't make the interviewer understand his ideas is as good as an ineligible candidate.

My summer preparations helped me a lot. I suggest reading up geeksforgeeks to clear the coding and the technical rounds. Each article in geeksforgeeks is important. Guessing never helps.

- Nitin Paliwal

AMAZON

As far as my love for CSE is concerned, it was the only branch I could relate to. My father is a computer supervisor and that instilled an inborn love for computers and coding.

For cracking the interviews, you have to be knowledgeable. There is no other way. Your knowledge can easily cover your lack of soft skills but your quality really stands out when you ace in them. Usually, there are many interviews for a company and if you are not armed with your project work then there's a chance of you falling prey to some technical question which could have been avoided had you talked about your project. As of now, I can't really pinpoint my goal. I might do an MBA or go for higher studies or reach a big post in the company. I am yet to decide.

- Raj Jha

WORKS APPLICATIONS

I am a branch changer who wasn't very interested in CSE in the first year. However, the burgeoning placements in CSE compelled me to switch. I was never very interested in competitive coding. It only helps you clear the coding round. On the other hand, having a good project is an indispensable asset. This is where a summer internship after the third year helps you. It not only gives you a project to talk about, but also teaches you how to work in a professional setup.Having good soft skills is a bonus but in some companies, like Works Applications, they are extremely necessary. It feels really good to be placed in a foreign company, which is quite rare in our college. I want to work in the company for around 3 years and build a career as a software developer. After that, I may go for an MBA and even start my own business.

- Pratik Jain

ADOBE

My brother, who studied CSE in an NIT, and my parents advised me to change my branch from petroleum engineering to CSE and I haven't looked back since then. In fact, my brother and I designed the MyCashBack website. GPA plays an important role. In Adobe, GPA was used as a tiebreaker if two students had the same score after the coding round. I believe the project section is the most important part of the resume especially for someone who isn't very strong in competitive coding. The first interview panel was impressed with my project and based the entire hour long interview on it. Good soft skills certainly help you, but are not mandatory. I want to continue in Adobe for the next 4-5 years. Maybe I will take CAT sometime in the future, and go for an MBA, but as of now, nothing is set in stone.

- Ronit Malhotra

STUDENT ACTIVITIES

Rishabh Mehta | BTech 2017
Aditya Thakre | BTech 2019

CSES EVENTS

Udbhav

Udbhav is the annual day of the department of Computer Science and Engineering, which in this academic year, was conducted on 27th of August, 2016. The aim of the Udbhav is to highlight the achievements of the department, and also to celebrate as a family. Cultural events like from dance, music and stand up were conducted, providing a stage for the students to extend their spectrum of abilities beyond regular academics. Several members of the CSE society, including alumni were venerated with several accolades.

Hackfest

They say men were given hands to change the world; the gods were given computers. The department of CSE, IIT-ISM Dhanbad believes likewise, and in keeping up with the ethos and praxis of true blooded programmers, conducts every year a hackathon, christened HackFestISM. This academic session, it was held from 20-22 Jan, 2017. It is a 36 hour long hackathon, in which the participants are selected after a rigorous selection procedure in which their project's capabilities, as well as their own are assessed. Where sleep is a luxury, the hacker's motto becomes eat-code-repeat, and to make sure that the participants can deliver this, all facilities, ranging from coffee, food, snacks, internet, etc. are provided free of cost.

Workshop on Smart Grid

A workshop on smart grid was organised by TCS representative Mr. Subhajit Ghosh on September 16th, 2016 from 11:00 AM to 12:30 PM. All the final and pre-final year students were invited to attend this workshop. He discussed about next-generation technologies that have the potential to bring about revolutionary changes in our lives especially the growing application of smart grids employed by modern utilities. He also discussed some of the technological advancements in smart grids that are currently being used extensively.

CodeRush V3.0

Computer Science and Engineering Society (CSES) organised the third edition of CodeRush, the annual coding competition on October 28, 2016. The two hour long coding competition started from 10:00 PM and witnessed huge participation across all the divisions. The problem setters for the event were Digvijay Singh, Deepak Kumar and Abhishek Jaiswal. The first year students competed in the Div 3, the second year students competed in the Div 2 and the rest of the students comprising third, final year UG, PG students, research scholars and the alumni competed in the Div 1.

Winners

Div 1.0	1. Rajesh Kumar Sinha 2. Vaibhav Goyal 3. Shubham Jain (Alumnus)
Div 2.0	1. Ankur Dua 2. Purshotam Singh 3. Priyesh Pratap Singh
Div 3.0	1. Ayush Kumar 2. Anupam Wadhwa 3. Vaibhav Kumar

ACM EVENTS

GOOGOL v2.0

GOOGOL was a nation-wide coding competition open for everyone. The second iteration of this event was conducted on 9th December, 2016. The winners at the national level were Ashish Kumar (IIT(ISM) Dhanbad), Kush Khandelwal (MNNIT Allahbad) and Kaushal Agrawal(IIT Kanpur). At the institute level, the winners were Ashish Kumar, Abhishek Jaiswal and Arunaditya Chanda.

Ode - de - Code 5.0

Ode-De-Code 5.0 - the biannual competitive coding contest was conducted by ACM-ISM Student Chapter on 5th August, 2016. The event comprised three divisions - third & final year, second year and first year. The winners were: Ashutosh Vashishtha for the first division, Sandeep Kumar for the second division and Ankur Dua for the third division.

ACM Spring of Code

The chapter organized a software development competition, ACM Spring of Code in which participants had to build a mini social network. The event was held in view of the chapter's unending belief in open source. Teams comprised 1 – 5 members. The competition was successful with more than 30 teams participating with 10 of them making innovative and creative submissions.

Hour of Code

Hour of Code is a global movement reaching millions of students over the world to provide them with knowledge of Computer Science and Technology with an intent to create awareness among the students, helping them pursue various tech related fields in the future. It was organized in December, 2016 in two sessions witnessing over 500 attendees in IIT(ISM) Dhanbad. Talks were given on Data Science, Android App Development and Web Development

TECH MILESTONES

Soham Satyadharma | BTech 2018
Pranav Thombre | Dual 2019

Google's much vaunted DeepMind AI has taken the next step. A combined experiment by researchers at Google's DeepMind Unit in London and the University of California used reinforcement learning to train the system about the physical properties of objects by interacting with them in different virtual environments. Significantly, DeepMind has already entered the exciting world of games, creating a single program that taught itself how to play and win at 49 completely different Atari titles, using only raw pixels as input.

Virtual Reality is being used by scientists all over the world in the field of mental health care, especially in exposure therapy for phobias and anxieties. For example, VR headsets can put an introvert in front of a virtual crowd in a controlled environment, thus helping him control his fear of public speaking. This system is an upgrade on face-to-face therapy, as it overcomes the main problems of the latter – cost and accessibility.

A deep learning technique that considers the entire sentence as one unit to be translated has been incorporated into Google Translate. It relies on a recurrent neural network algorithm, consisting of layered nodes, with two eight layer networks acting as the encoder and the decoder. The encoder transforms the input into a list of vectors representing all possible meanings of each word while the decoder translates one word at a time. This new method has already reduced translation errors by 60 percent, compared to the previous algorithm, which was phrase based.

Researchers at IIT Bombay have developed a method to help computers detect sarcasm in sentences, by analyzing the similarity of words and how they relate to each other in Word2Vec, a Google News stories database containing about 3 million words. After determining how frequently words appear next to each other, they were represented as vectors in high dimensional space. Similar words were represented by similar vectors and sentences that contrast similar and dissimilar concepts were more likely sarcastic.

The International Space Station (ISS), the shining beacon of scientific hope for ages, continues to surprise. In an experiment aboard the ISS, a small drone has learned to determine distances using a camera eye. The Synchronized Position Hold Engage and Reorient Experimental Satellite drone started navigating the space station, recording stereo-vision information about the surroundings using two camera eyes and, then learning about distances to nearby obstacles. The drone could also explore autonomously using one eye, when the stereo vision camera was switched off.

A method for retrieving visual information from scattered light has been created by researchers at Massachusetts Institute of Technology (MIT). This could lead to medical imaging devices that use the visible spectrum. The current medical systems use a combination of magnetic field and pulses of radio wave energy, X rays, ultrasound and other more expensive methods. This new method can also lead to computer vision systems functioning in poor visibility. Certainly, flights held up by fog could use this.

Researchers from UMC Utrecht in the Netherlands have used a brain implant to help a patient with amyotrophic lateral sclerosis (ALS) operate a speech computer with her mind. The researchers placed electrodes in the patient's brain, enabling her to wirelessly control the computer. The patient operates the speech computer by thinking about moving her fingers; this changes the brain signal under the electrodes, which is then converted into a mouse click. A screen is presented to the patient showing the alphabet and a few additional functions, each of which light up one by one. The patient selects a letter by using her brain to influence a mouse click at the right moment; the system enables the patient to compose words, letter by letter, which are then spoken by the speech computer.

Researchers in Japan are developing an artificial intelligence system that can design book covers without human assistance using a machine-vision algorithm that can deduce a book's genre by its cover. Researchers Brian Kenji Iwana and Seiichi Uchida at Japan's Kyushu University trained a deep neural network by first downloading 137,788 unique book covers from Amazon.com along with each genre. They then employed 80 percent of the dataset to educate the four-layer, 512-neuron network to identify the genre by the cover image. An additional 10 percent of the dataset was used to validate the model, and then the algorithm was tested on the remaining 10 percent. Iwana and Uchida say the network listed the correct genre in its top three choices more than 40 percent of the time and identified the precise genre more than 20 percent of the time.

Salim

Raj Roushan | BTech 2017

"Salim... Salim! Arre kaha par hai? jaldi se upar aaja." "Aaya ammi." Then sprouted up from the stairs, a 12 year old Salim, slim and agile, short hair cut straight along the forehead, wearing just his vest and an underwear, running under the sun, his face glowing with the most innocent of laughters. *"Ji ammi?"* said Salim in his sinless little voice. *"Aise kyu ghoom raha hai? Kapde kyu nahi pahne tune? Ab sardi badh rahi hai. Badalte mausam me sambhal kar rahna chahiye."* Ammi looked at his naughty little eyes that were looking back at her. Her heart smiled. *"Aaja mere paas baith. Thodi der dhoop sek le, mai sar me malish kar deti hu."*

Salim sat down on the ground, in front of his mother who was sitting on a brown wooden rope cot. They basked under the morning sun, Ammi massaged some oil on Salim's hair, and Salim sat enjoying his mother's love. *"Tere mama ne bahut acche school me baat kari hai tere liye Banaras me. Tu acche se padhai karna. Vaise bhi mere Salim ki sab tareef hi karte. Bahut hoshiyar hai mera beta."*

Ammi kissed Salim on his head. Salim smiled. *"Parso tu chala jaayega. Mama ke ghar rahega. Acche se rahna vaha par. Apna khayal rakhega na?"* Salim turned to Ammi and said, *"Haa Ammi, aap chinta kyon karte ho? Aapka Salim ab bada hogaya hai."* Ammi smiled and looked at Salim's face. A look that wanted to capture every bit of her son forever in her eyes. *"Arre Salim!"* called his Abba from the patio below. Salim ran to the edge of the roof, *"Ji Abba?" "Aaja tujhe baazar le chalu. Parso subah tu jaayega to vaha tujhe kya kya jaroorat padega, sab leke aate hai. Aaja jaldi se."* Salim turned to Ammi who smiled and nodded her head. He ran down the stairs in the excitement of his new goodies. . .

(Somewhere in Lucknow)

"Arre bhaiya jaldi chalo! Train chhoot jaayegi. " "Bhaiya hum kya kar sakte hai. Auto chala rahe hai, hawai jahaj thodi na..." And I reached the station just in time. I ran towards platform number 3. I could see my train under me, beginning to move, as I rushed from over the bridge. I ran down the stairs and jumped into the nearest bogie that I could reach with the one backpack I had, and sat down at the door to take some long heavy breaths. I got down at Barabanki junction to get to my bogie. As I settled on my berth, the train started moving. I looked out the window and saw a woman running behind the bogie. The train caught speed and the woman could not; catch the train. I sat down. The train was full. No vacant berths. Mine was berth number three, lower berth, lucky me... Or was I? The other three seats in my compartment belonged to this small family of three - Mr. And Mrs. Sharma and their 5 year old child, Harsh. They were a happy little family, going to Harsh's grandma's home for vacations. Harsh took his place on the upper berth, playing with his air filled ball. I always like watching little kids, involved so deeply in their little activities. We all settled down. Mr. Sharma was quite a jolly and friendly person. He told me how much he loved to visit his mother on every vacation. Listening to his lovely tales, I too started to miss my mother. He also told me that the TTE had marked my seat empty, as I didn't board at Lucknow. So now I had to get my own seat back from him. I got up and moved to the aisle to look for the TTE. Crash! Blared a loud, harsh sound past my ears. I was floating. Slow. The bogie turning around me. Berth no. 6, unoccupied. The air turning red. All of it sketching a panorama. Faster than I could feel. Slower than I could see. A splash beside my ear; left. Turning around, a look at the flickering bulb, the light dimming with my vision, slow and calm.

Harsh hit his head. The redness on the wall. My vision turning grey. Sharma ji's body pressing against the berth... I hit the ground before I could know. I felt the pressure entering my body, the pain killing me from left to right. The sound of my broken ribcage, as it pumped with my heart. I lay there; the floor pushing on me. The small body of a baby girl lied in front of my eyes. Looking at that baby's small face; red with blood, my sight turned black.... The next I opened my eyes, I could see a man's hands, holding around my shoulders, and another man holding my legs. I could see people lying all around. I heard a woman cry... *"Salim…Sali..."* ▪

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