AUG 2017

AN INSIGHT INTO CSE

BUFFERED READER V4.1

COVER BY
HARSHA VARDHAN
DUAL 2020

CONTENTS

FROM THE HOD'S DESK

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I am elated to see that the Editorial Board has come up with the seventh edition of *BufferedReader*. For the past three years, the magazine has evolved to satiate the hunger of those who crave for technology and its latest advancements. The efforts made by the *BufferedReader* team have not only been greatly appreciated by the faculty and student fraternities of IIT (ISM), it has won laurels outside the campus as well. As I preside again as the Head of the Department, I value the hard work of the team and extend my warm congratulations to them on coming up with this issue.

Our country has gone through tremendous economic reforms in the past few months. With the demonetisation policy, the government has urged people to move more towards the digital payment of goods and services. The seventh edition of the magazine talks about Digital Economy and how Computer Science, as abstract as it may be, is an essential part of making of the digital India.

This edition also offers a glimpse of all the activities, the CSE Department pursues, within and outside the campus, as part of its endeavour to impart maximum opportunities to the students. On one hand we bade farewell to the batch of 2017 to wish them a successful journey beyond. And on the other hand, after a month, we organised Confluence 2017, calling upon all the alumni of the department to come together and be a part of the department, once again.

I extend my sincere thanks to the students who have come up with this new edition and acknowledge their efforts. I also express my gratitude to my fellow faculty members for their valuable suggestions and extended support. I would love to know the honest feedback on the contents, quality and design of the magazine. Do share it with me at **cse@ismdhanbad.ac.in**

Happy reading.

EDITORIAL

Every creation of man has been with the aim of best utilising one entity- time. Over a century ago, when Lady Ada Lovelace and Charles Babbage worked on what would be called the first computer, not once would they have imagined that their steps would translate to intergalactic leaps, which humanity has now achieved. Living in an era where time is calculated in nanoseconds, allow us to present a quick overview of this version of *BufferedReader*.

In this edition, the spotlight is put on the Digital Economy of India, as we explore the rise of internet-based startups in our country. It's nigh impossible to come across a person who isn't reaping the joys of online shopping, banking, or cashless transactions these days – but it wasn't always this way! Join us as we try and make sense of how it all came to be the way it is.

The faculty article, written by Dr. Amgoth Tarachand focuses on one of the foremost technological milestones of recent times i.e., drones. Be it agriculture, healthcare, disaster relief, weather forecasting, military or remote sensing, drones are revolutionizing the methods of monitoring and surveillance. This article addresses one of the most prevalent questions of our time: will drones actually be able to augment humanity, or are they just another manipulation of technology?

We would like to thank our Head of Department, for his continuous and unending support. We would also like to thank the faculty members of our department, without whose support it would not have been possible to make *BufferedReader* as successful as it is. After all, as all programmers know, no program is possible with multiple modules!

How Technology Has Disrupted Commerce In The World

Aditya Sood — Dual Degree 2020
Harmandeep Singh Kahlon — Dual Degree 2020
Tanishk Kithannae — Dual Degree 2020

DIGITAL ECONOMY

For as long as our ancestors have known to communicate with each other, mankind has been involved in the trade of goods and services. The origins of modern day commerce lie in the elementary barter system, wherein goods or services were directly exchanged for other goods or services. No medium of exchange, such as money, was involved; and both the parties had to interact physically.

That is, until computers first began to make their contributions to the world of finance towards the end of the 20th century. And since then, the contributions have revolutionised the field. Take banking for instance: people can now access their money from anywhere, any time, and complete transactions in an instant. Queues, bank holidays, unavoidable time gaps, etc. are a thing of the past and no longer affect day to day transactions. As made abundantly clear by the previous example, not only did the new computer-empowered procedures have none of the disadvantages of the former ways, they also had added advantages of their own. So it isn't surprising that computer technology then ushered in a new era in the field of Commerce and Finance, and is steadily revolutionising every traditional aspect and procedure of the same.

Fast forward a few hundred years, and the advent of currency changed the way people took part in commerce. Individuals could now 'store' the ability to buy goods and services in the form of currency, and purchase items without having to barter something in exchange. It was, without doubt, the most critical feature of commerce.

In simple terms, digital economy is defined as an economy based on computing and other digital technologies. The ambit, however, extends to many sectors of the traditional economy which further blurs the lines of distinction.

It largely consists of three main components:

e-Commerce

Short for electronic commerce, it is basically about transactions involving selling or buying goods/services online. Popular examples of the same are online shopping sites for retail (Amazon, Big Basket, Myntra, etc.); online booking (travel, events, cinema, etc.); and digital wallets, among other things.

It is perhaps the most visible component of the digital economy as far as the average person is concerned – companies such as Flipkart, Amazon, PayTM, etc. have become household names throughout the country. India has also witnessed skyrocketing growth over the past decade for the purchase of e-commerce related goods/services by our citizens, and it is definitely amongst the driving forces of our economy. Even at a global level, e-commerce is a major contributor to the economic growth of the developed, and many of the developing countries.

e-Business Infrastructure

It includes all the infrastructure essential for e-business, which means everything from hardware and software to telecom and internet networks, and capital. These entities are essential for e-business to be conducted, much like how roads, irrigation facilities, storage warehouses, etc. are essential for the agricultural industry.

e-Business

Electronic business is a broad category which includes organisations that conduct their business over the Internet. The business can be anything, as long as it's conducted online. Since many such organisations are involved in e-commerce, the two terms are loosely interchangeable.

Prominent Examples

Billionaire, inventor, innovator, entrepreneur – these are some of the words that describe Elon Musk, co-founder of PayPal – the first online banking company to reach a billion-dollar valuation. As early as 2001, Musk, along with some select others, had the foresight to predict the coming technology boom. This foresight would propel him, and others like Jeff Bezos, the man behind the world's biggest online retailer Amazon; to near-overnight fame and riches.

When the internet bubble reached India nearly a decade later, it saw the rise of multi-billion dollar startups reaching a growth rate never mirrored before. In a time when the Indian retail business was known to be notoriously difficult to break into for a newcomer, the adoption of Flipkart and Snapdeal in Indian markets was near instantaneous. These were among the first successful attempts at taming the digital markets of India, and came at a time when even established giants like Amazon were wary of venturing into the Asian subcontinent.

The last few years have seen multiple Indian startups turn into unanticipated stories of success – Ola Cabs sharing the on-demand taxi market with Uber; Oyo Rooms operating similar to Airbnb in the US, and turning into an almost household name; Zomato becoming a 'must-have app' to counter Yelp in other countries; companies like MakeMyTrip and Yatra pushing Expedia and TripAdvisor out of the market; and PayTM turning into a cash alternative for vendors nationwide.

Changes Brought About

The impact that these internet-based companies would have on the Indian market was constantly underestimated in the last decade. 10 years ago, it was not absurd to think that online shopping would not play a large role in the average middle-class Indian's life. However, the liberalisation of the markets, starting in 1991 and boosted by the current regime with schemes like 'Make in India' and 'Digital India', along with the availability of cheaper internet services to nearly half a billion Indians has led to massive unprecedented growth in the sector.

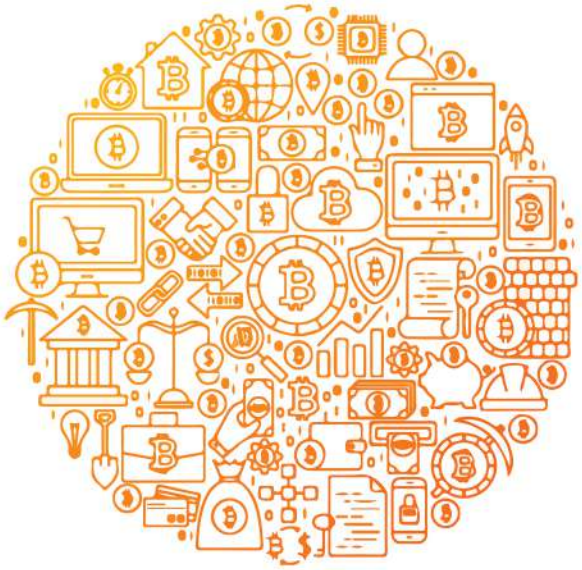
News-show pundits argue that this migration of services to the online realm hurts small-time brick-and-mortar vendors. While e-commerce accounts for less than 1% of the total retail market in India, it is undoubtedly the fastest growing sector, expecting to grow to over $22 billion in gross annual sales in five years from the current $3 billion. Economists, however, argue that this stiff competition will lead to higher quality products at lower prices in the long run. Either way, the digital world is here to stay.

Impact On The Economies

Demonetisation was a mighty challenge. In a nation where as of Nov 2016, 68% of transactions were carried out by cash, there was a sudden deficit of money. 86% of the cash had been extruded (and recycled), and with new notes moving in at a snail's-pace, the saviours of the day were mobile payment wallets; the likes of PayTM, PayPal, MobiKwik, etc. Even though India is still relatively new to the idea of an entirely digital economy; the world over, the idea has been implemented with great success. While sceptics argue that this could be a reality only for developed countries, given that more than 70% of Kenya's population is actively using mobile payments, this statement cannot be validated. Of course, there were multiple factors to its success, such as a high mobile phone penetration and accessible credit systems; but that doesn't overrule the fact that an entirely digital economy can very much be a reality.

Also, with the advent of cryptocurrency, we can have entirely decentralised systems allowing for easy money transfers. While most people frown upon the name of Bitcoin, now synonymous with illegal trades, the truth is quite the contrary. In several African nations, where people cannot afford credit card services from banks, owing to the high costs, Bitcoin has provided them both security under anonymity, and a service for transactions; much unlike other payment gateways. For example, if one were to send money via a bank for an international transaction, the cost margins could be as high as 9%, with a 5% margin for currency conversion. For Bitcoin, it's absolutely free. Besides, several companies of repute have already taken to Bitcoin. Microsoft accepts it for XBox payments; and so does Subway for its sandwiches. Similarly, there are several others out there who have accepted Bitcoin as a currency. But the most important part about all this is that it will allow us to eliminate payment gateways. Cryptocurrency uses volunteers to verify transactions, and hence is free of cost. Payment gateways, such as Visa, Maestro, etc. levy a certain charge on every transaction you carry out, to provide the exact same service as a cryptocurrency would: secure online payments. This would help reduce overall costs for everyone- businessmen, shopkeepers, and even you and me.

Of course, all these systems need a long time to mature to the extent where they are a non-esoteric and friendly service that can be availed by all. Added to this is the issue of it being an online service - we actually need people to be online . In India, as of 2017, smartphone penetration for urban areas was projected to be 60%, and approaching saturation, while for rural areas, it stood at 48%, with potential for growth.



For an entirely cashless economy, we need to have as many people as possible with access to the internet. Even if we were to disregard mobile payments, most people in India do not have a bank account for card payments; despite the several schemes that have been put forth. Another issue is related to cyber-security: India is rather outdated in security infrastructure, making our systems susceptible to attacks. 70% percent of the ATMs in India run on Windows XP, which is so old that Microsoft stopped supporting it a few years ago, and with the recent WannaCry ransomware attacks, ironically, the only argument that banks had was that the systems were so slow and outdated, WannaCry couldn't affect them. Moreover, as far as mobile payments are concerned,we do not have any big players in India. For all of you shouting PayTM mentally right now, please note that with reference to companies like Alipay (with an annual transaction volume of around $2.9 Trillion), PayTM has now reached a modest annual volume of only $10 Billion, that too after the digital economy drive following the demonetisation. (That's around 290 times lesser than AliPay). We do not have any mobile payment companies of that size, severely constricting the ability to rely on them.

Nevertheless, considering the ease with which digitisation is driving economic growth, one can rest assured that all these concerns will be alleviated in the days to come ensuring that a 'Digital Economy' is the economy of the future.

Hackfest 2017

The event spanned from 20th January, 2017, 10:00 PM IST to 22nd January 2017, 11:00 AM IST. The participants competed for prizes worth over INR 3,00,000 along with hiring opportunities.

fb.com/hackfest17
hackfest.co.in

Aditya Thakre B.Tech. 2019
Soham Satyadharma B.Tech. 2018

Young minds when partnered with creation and innovation can throw into the world table turning modules and solutions; a lot of them never even fathomed before. Indeed, they are the flag bearers of the technologies to come. To encourage such a symbiosis between undergraduate students and the industry, a hackathon was organised at IIT (ISM) Dhanbad fondly named HackfestISM. Being one of the prime fests of the institute, it attracted a large flock of inspired students from across the country to participate in a 36 hour long ceaseless, peace-less, cruel battle organised from 20th to 22nd Jan, 2017. Hosted by the Computer Science and Engineering Society, the fest brought to the table a number of projects, many of them having interesting industrial angles.

HackfestISM was the second hackathon organised in the college and was conducted in the good old Penman Auditorium. Rigged with a swarm of wires running endlessly, the closed space could have given a claustrophobic attack to any non-tech guy. The auditorium was easily overwhelmed with brain power of the chosen ones. Banners of tech companies adorned the walls of the auditorium, students wore cool t-shirts and the stage was lit with projectors casting almost geeky lights. Eminent people from the tech industry joined the students, discussed ideas, talked about ambitions and deliberated on how they wanted to make the earth a better place to live. The elegance of the event was immersive; its grandeur breath-taking.

Qualifying for participation in the hackfest was a challenge in itself. Out of the 200 teams that applied, only 48 could survive the intense scrutiny of their ideas and proposals. Each team had a maximum of 5 members. The prizes were set as Rs. 10,000, Rs. 6,000 and Rs. 4,000 for the first, second and third positions respectively, with added incentives like internship opportunities and more. Excited rumours gave way to reality when the fest came with perks such as free food, intriguing seminars and an ambience encouraging utmost productivity. With a sea of laptops, electronic modules, a complex network of wires, bobbing heads, the sight was a slight peek into a future expected to be driven by technology. Speaking about the projects, they ranged from fiction-to-reality android apps to machine learning applications, from electronic modules to web development and so on. The students were praised for their efforts and ideas.

People who judged the event shared the flare of pushing technology to new heights. Dr. Chiranjeev Kumar, HoD, CSE; Dr. Mukul Kumar Das, Associate Professor from the Department of Electronics Engineering; Mr. Vaishak Shanbag and Ms. Alakananda Bhattacharjee, both from Atkins were the judges. The event also included a Q&A session with the founder of MCaffiene, Mr. Tarun Sharma, an alumnus of the 2011 batch of B. Tech Electrical Engineering, at 2:30pm on 22 January. After an intense period of 36 hours, in which teams stood true to their fancy names, team Knighthood emerged as the winner of HackfestISM, seizing a sum of Rs. 10,000. They came up with a Windows application called Krishikit which aimed to support farmers at every step - from buying the seeds to selling the harvest. It provides the updated price of the crop as fixed by the government; forecasts the weather, and suggests the most profitable crop to grow.

The second position was bagged by team Sangyan which aimed to reduce hunger and malnutrition in India. Their aim was to bridge the gap between potential donors and potential beneficiaries of food, fresh water, and oil, by building a working prototype where they can interact with each other in real time. Donors range from single households to big organizations like supermarkets, malls, banquet halls, hotels, restaurants etc., while potential beneficiaries include the registered NGO's that are already working to eliminate hunger, but are struggling in the procurement of needed items, depending on various parameters like season, place, previously grown crop, soil health, and crop rotation cycles. RANN_U, the team that positioned third in the hackathon, aimed to build an Intrusion Detection and Avoidance System to guard the frontiers of the country and other critical areas. They worked to build a dual camera system that could accurately determine the position of an object in 3-dimensional space, with standard attack protocols being followed. They built a laser emitter to demonstrate the firing on an intruder who does not follow the protocols. They aimed to enable the image processing even at night time, by sensing the decrease in vibrations of the surroundings, which would automatically trigger an array of floodlights. They also described their idea for vehicle detection, based on the colour and number plate of a vehicle.

The event ended with a vote of thanks to all the organisers who worked tirelessly to make the event a reality and stood true to the hopes of the participants. The faculty members and the CSES were also thanked for their support and encouragement. At the end, the judges gave the students some guidelines on how to move on and also appreciated their hard work and persistence. The event brought to the fore a series of interesting projects undertaken by groups of undergraduates with little or no help that left everybody impressed. The stature that HackfestISM manifested was never seen before and raised the bar to a whole new level.▪

INTERNS' EXPERIENCE

Aditya Thakre B.Tech. 2019
Abhishek Chattopadhyay B.Tech. 2019

Ankit Jain
WalmartLabs

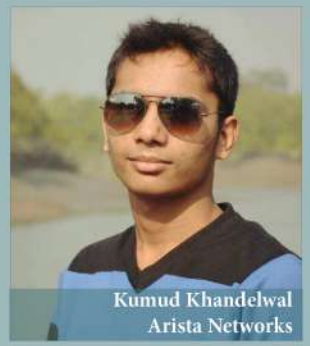
Being a part of the corporate world was a great experience for me. The interns were treated at par with the employees, and we were exposed to the live projects. Flexible working hours allowed us to work conveniently. The project allotted to us was totally different from our studies, but the inspiration and support from the manager and the rest of the team helped us.

My project there was to automate 'Harmonised Tariff Schedule (HTS)' code in 'Buyer Connect 2.0'. I, as a part of my team, was responsible for designing the web API for deletion, searching, and updating of HTS.

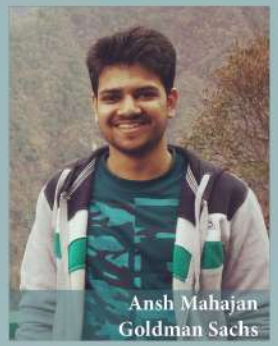
To get the internship, I worked on Data Structures and Algorithms; and also prepared the core subjects like Operating Systems and Computer Networks. Competitive coding is a must as it is the first criterion to get selected by any company. Confidence and good communication skills are required to clear the HR interviews.

I felt lucky after selection, especially due to the fact that the competition was very tough. I did not do a lot of competitive coding, but I had a good grasp on the C programming language and Data Structures. Arista heeds the fundamental knowledge in the candidates. Your CV needs to be honest, not lengthy. For Arista, knowledge about Computer Organisation and Operating Systems is also required.

My time at Arista was great. We worked on live projects of the company, along with the other FTEs, some of whom had more than 10 years of experience. My project was on RPM granularity dependency. In simple terms, I was asked to check the availability of various packages on which the main program was dependent, before the execution of the main program. There were a lot of technicalities involved, and it took me two full months to complete it.



Kumud Khandelwal
Arista Networks



Ansh Mahajan
Goldman Sachs

Goldman Sachs has a pretty flat hierarchy, and does not follow a cubicle culture. Interns are also treated as employees. The projects you do are live, and would go into production in future.

GS lays great emphasis on networking – get to know as many people as possible; across teams, divisions and even countries. Another very important thing at GS is building consensus. If a group of people are working on a project and a change is suggested, everyone has to agree on it for it to be implemented. One single person doesn't take decisions for the team. There were lots of experienced people with whom you could interact; and learn something new and interesting. Over the course of the internship, we also had numerous learning sessions, senior leader talks and networking sessions - all of them aimed at helping us integrate better into the firm.

My experience there was overwhelming. Microsoft has a beautiful campus, and the facilities were simply great. The work culture was very relaxed and friendly. There was no time bound or compulsory working hours. My work was to convert the data of relational databases to graph databases, and to make a web API and web application for the same.

For getting the internship, I had done competitive programming in my previous years. So, I had a good knowledge about Data Structures and Algorithms. In addition to that, 2-3 months prior to the interviews, I concentrated solely on InterviewBit and GeeksforGeeks. Projects are one of the most important parts of your resume: Specify only those things that you have done. Don't try to fake anything. To my juniors, I would advise them to make their fundamentals strong. By that, I mean try to learn subjects like Data Structures, Algorithms, Operating Systems, Computer Networks, OOPs and DBMS as much as possible.

Arjav Patel
Microsoft

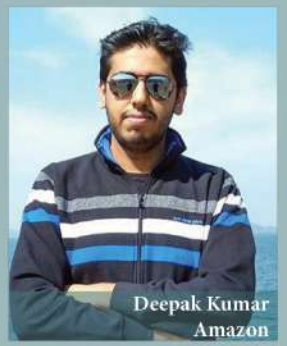
Praful Mathur
Samsung R&D Bangalore

My internship at SRIB provided me exposure to a corporate environment, working with current technologies. Living together with more than 30 of my co-interns was a unique experience in its own right. My project was based on Cloud Computing. I was required to design a 'Scheduler' to carry out the computations using Amazon Web Services. The project was full of challenges, such as not knowing the execution time of the tasks to be scheduled; and maintaining the optimality of the 'Schedulers'. The work culture in SRIB was pleasant: Everyone was supportive and ready to help out with your problems.

For getting the internship, I did majority of my preparation from GeeksforGeeks and Leetcode; apart from the regular practice on Codechef and HackerRank. Projects on Machine Learning, Image Processing and other trending topics give you an upper hand. Mathematics, especially statistics and probability, is important and should not be neglected.

Amazon is a great place to work at. In the orientation program itself, they said that they consider interns at par with the normal SDEs. So the projects allotted to us were good, and of immediate use there. Java is the most commonly used language for development. Regarding work culture, there were no restrictions on dress code and office timings. Most importantly, you work with some of the smartest people in the industry. I worked there in the core transportation technology team, at the Hyderabad centre.

For preparation, I did competitive programming and focused mainly on Algorithms and Data Structures. However, subjects like OOPs, Operating Systems, Computer Networks are equally important. From my experience, the company mainly focusses on your knowledge of Data Structures and Algorithms. Apart from this, good projects will give you an edge and increase your chances of being shortlisted. Also, practice writing clear working codes on paper.



Deepak Kumar
Amazon

Department Highlights

Maheswara Reddy Chennuru Dual Degree 2018
Nishit Dabi B.Tech. 2018

Welcome to First Year (B.Tech, Dual Degree, M.Tech)

Dear Freshers, congratulations on joining IIT (ISM), Dhanbad! The department welcomes all of you to this prestigious institute, and hopes that you have an enriching and memorable experience during your studies here. Things look better than ever before for the department, with a steady and robust growth in placements; as well an impactful presence in both the industry and academia. The Computer Science & Engineering Society (CSES) and the ACM Student Chapter of the Institute are two driving forces of this growth. Together they organise a plethora of events: Guest lectures, coding competitions, workshops; along with co-curricular events such as 'Udbhav' (annual day celebrations of the department), and Inter-branch sports competitions. Thus, the students are constantly provided with opportunities for their holistic growth. The senior students of the department also pitch in towards the growth of their juniors through initiatives such as 'CodeISM' (Weekly coding classes) and 'SpeakUp' (Public speaking classes). To develop and foster the relationship between the existing students of the department and the alumni; we organise 'Confluence', the annual alumni meet. And then there is *BufferedReader*, the bi-annual magazine of our department. The magazine presents its readers with the latest activities of the department, as well as that of the world of Computer Science. It is also the most well received magazine of the Institute. With that, the department wishes all of you its very best for your endeavours to contribute to the department's growth, and your own, in the future. Good luck!

Change of Headship

Prof. Prasanta K Jana has been appointed as the new Head of the Department while Dr. Chiranjeev Kumar has been appointed as the Professor in-Charge of Training and Placement Cell.

Farewell of Dr. Shweta R. Malwe

Dr. Shweta Malwe has contributed tremendously to the department. She has been the faculty in-charge of the *BufferedReader* since its inception. Her effort towards bringing out the best in us are immeasurable. You have been an inspiration to all of us, and a mentor that we always look up to. We wish you all the best for your future and hope you will keep in touch with us from time to time .

Student Affairs

- This year 57 students changed their branch to B. Tech CSE while 5 to Dual Degree CSE.
- A total of 92 jobs were offered for a batch of 115 students in the previous academic year (2016-17).

Ongoing R&D Projects

- Information Security Education and Awareness (ISEA) – Phase II (MCIT)
- Design of Reliable and Energy Efficient Transport Layer Protocols for Ad-hoc and Sensor Networks (SERB-DST)
- Energy-Efficient Intruder Detection Schemes for WSN using Learning-based Techniques (DRDO)
- Node Mobility Techniques For Tactical IP Networks (CAIR Labs)
- Design and Implementation of Multiple Strategies to Identify Handwritten Forgery Activities in Legal Documents (SERB-DST)
- Precision Agriculture Model to Increase Crop Productivity in India using Big Data (SERB-DST)
- WSN based Disaster and Environmental Monitoring System for Safety of Miners working in Underground Coal Mines (CSIR)

Achievements

- Prof. G. P. Biswas was awarded 'Canara Bank Research Publication Award' in recognition of his excellence in research publications based on cumulative impact factor of the SCI / SCIE / SSCI indexed Journals.
- AMDOCS Innovation Project – Three teams qualified for Top 5 and Two of them qualified for top Three (2nd & 3rd) and received Rs. 50,000 each.
- TCS CodeVita Participation - Two teams qualified for the finals.
- AMAZON Code Wizard Challenge 2017 – Two teams in Top 10.
- Mr. Akash Rawal (2K18) qualified for Google Summer of Code (GSoC).

- One team qualified for the finals in the Smart India Hackathon'17 hosted by National Informatics Centre, Ministry of Electronics & Information Technology, Government of India.
- Mr. Janmajai Rastogi (2K16 Batch) – First prize (Rs. 50,000/-) in 'CrackTheCode' - a Hackathon hosted by Paysafe.
- Mr. Sawrav Roy (M.Tech 2K13) won the AFT (Amazon Fulfilment Technologies WW) Defect Destroyer Award.

Amazon Code Wizard Challenge 2017 – Two teams in Top 10

Short Term Courses
(Organized)

- Short term course on Data Mining & its Applications during 27 Feb to 03 March 2017.
- Short term course on Digital Imaging: Techniques and Applications during 04-08 April 2017.
- Short term course on Conceptual Big Data during 07-09 June 2017.

Sports Meet - 2017

"All work and no play makes anybody Dull"

That's one age old adage and it can't be closer to the truth. There's a reason why children are encouraged to play just as much as they are encouraged to study – Playing sports is fundamental for a child's growth and development. However, as we grow and become adults, our busy schedules obscure sports into the background; and eventually, out of our lives. What is striking, though, is that their effectiveness as an activity for rejuvenating us doesn't reduce one bit from what it was in our childhood. Infact, adults bond better with each other over sports than any other activity. Keeping such fundamental truths in mind, and with an eye for cementing the warm relations between our department's soon-to-graduate students and the faculty; the Computer Science and Engineering Society conducted the very first edition of the indra-departmental Sports Meet.

Ph.D. Awarded

- Dr. Ajay Kumar Yadav on 'Study and Development of Routing Protocols for Multicasting in Wireless Mobile Ad Hoc Networks'.
- Dr. Ruhul Amin on 'Secure multi-factor authentication schemes for remote login and real life applications'.
- Dr. Debasis Das on 'Processing and analyzing fingerprint images with applications in biometric security'.
- Dr. Kshiramani Naik on 'Design of some transform domain based image cryptosystem, steganography and watermarking schemes'.
- Dr. Rishav Singh on 'Study & development of new born face recognition techniques in a semi-controlled environment'.
- Dr. Rohit Kumar Yadav on 'Design of soft computing methodologies for bio-informatics problems'.
- Dr. Srikant Jannu on 'Study and design of energy efficient routing algorithms for wireless sensor networks'.
- Dr. P. C. Srinivasa Rao on 'Designing soft computing algorithms for wireless sensor networks'.
- Dr. Praveen Lalvani on 'Study and investigation of routing protocols for wireless networks using soft computing'.
- Dr. Tapas Kumar Mishra on 'Design of reliable and energy efficient protocols for Ad-HOC networks'.

Higher Studies

- Mr. Rahul Bhansali (2K13) took admission at the Stony Brook University.
- Mr. Anupam Samanta (2K14) took admission at the Stony Brook University.
- Mr. Deepak Gupta (2K14) took admission at the Stony Brook University.
- Mr. Sakshi Gopal (2K14) took admission at the Carnegie Mellon University
- Mr. Snehil Tiwari (2K14) took admission at Texas A&M University.
- Mr. Mohit Chawla (2K16) took admission at the Cornell University.
- Mr. Bhargav Parsi (2K17) took admission at University of California, Los Angeles.
- Ms. Kriti Singh (2K17) took admission at the Cornell University.
- Mr. Shakti Singh (2K13) took admission at University of Texas, Dallas.

INTERNET OF DRONES

Dr. Amgoth Tarachand, Assistant Professor

You have heard about Internet of Things (IoTs), the common name given to all the various connected sensors and machines. However, most of these 'Things' stay in one place for most of the time; constantly observing their environment and recording data, which is later proccessed into meaningful information for the end user. They typically consist of:

1. A sensor node 'stationary' e.g. on a roadside or a bridge that gathers input
2. A connection (via the internet) between the node and data collection center
3. A centralized data collection infrastructure that is commonly based in the cloud.

In the world of IoTs, unmanned aerial vehicle (a.k.a drones) are finding their ways into IoT implementations. Drones are already beginning to efficiently replace the connected sensors at stationery with one device having the following features:

- Ease to deploy
- Flexible payloads
- Reprogrammable
- Measuring anything, anywhere

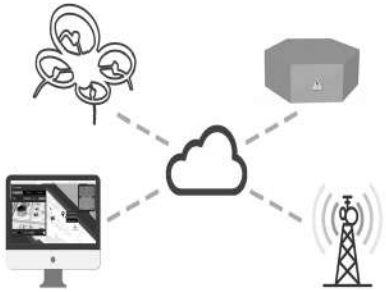
FEATURES

EASE TO DEPLOY: If a drone is a connected (via the internet) device, you can control from your smartphone in a city X and control a drone in city Y. Drone deploy does it by marrying a simple 4G telemetry device to a drone's avionics. This enables real-time data transmission, processing, and sharing. With this kind of setup, one can plan missions (launch, point A, then point B and to point C, etc.) in a browser. Upload them to a drone anywhere, press start, and it goes.

FLEXIBLE PAYLOAD: So one of things users want is the ability to mount different sensors such as thermal imaging or multispectral cameras, sniffers and microphones to the drones. PrecisionHawk (multi-rotor and fixed wing drone) figured out early on how to offer an array of sensors that are swappable and just snap into place. The cool thing about the aircraft is that the body itself is made of circuit boards and processors.

REPROGRAMMABLE: So, not only you can deploy anywhere, but they are reprogrammable while on a mission. Let's say you wanted to create a 3D map for a construction site project and you programmed it to run its mission but in the middle you noticed something wrong then you can divert the drone, perform another operation then resume and complete its mission.

MEASURING ANYTHING, ANYWHERE: Every day, you can read about measurement sensors are getting smaller and lighter. Such is the case with LiDAR, which allows you to capture minute details and measurements. Stationary is the most accurate but lacks the significance of an aerial perspective. You can get good from aircraft but not as good as from drone. With a drone one can get close to the objects.



Drones using cloud for data syncing
Pic Credits : UAVIA

APPLICATIONS

Utilities: Transmission and distribution (T & D) operators and utilities across the globe are beginning to look toward drones to reduce costs, improve safety, increase reliability and decrease response times across their systems. T&D workers have traditionally performed line inspections and maintenance, storm damage assessments, and vegetation management using line crews, helicopters and third-party inspection services companies. Drones present an alternative to the high-cost and dangerous work done by T&D operators, while having the potential to offer many additional benefits. The value proposition for T&D utilities to complete at least a portion of their inspections, maintenance and damage assessments via drones and robotics is strong.

Agriculture: Precision Agriculture is a new concept in crop management strategy that utilizes information technology with the aim of improving production and quality while decreasingproduction costs. Precision drones provides a comprehensive list of uses for drones to help farmers quickly increases their return on investment by providing integrated geographic information by providing integrated geographic information system mapping, crop health imaging and low-cost aerial camera platform. When compared with satellite imagery, using drones is a much cheaper option that provides higher resolution images.

Construction site: The industrial IoT is developing quickly on construction sites around the world. Construction sites present IoT with a number of fixable problems, including dangerous working conditions and lost items or machinery. Here is a list of ways drones can enhance construction site operations, surveying, showing clients the progress, monitoring job sites and inspecting structures.

CHALLENGES FOR INTERNET OF DRONES

Autonomy: Device autonomy relates to the control of the drones and can be used to specify whether a drone can fly autonomously or needs remote controlled navigation by a (human) pilot. It is important to note that to ensure safety, drones are obligated by law to stay in RC range for human intervention in case of an emergency. Drones can fly autonomously following pre-computed or adaptive waypoints. These waypoints can be decided by a central processing entity, like a base station, and then sent over a communication link to the drone. The drone can also decide its path on-the-fly by using the information collected from the environment (terrain, obstacles, as well as presence of other drones) via on-board sensors.

3D Nature: The 3D nature of the network demands the support of various types of links. The links in an aerial network can be either air-air (A2A), air-ground (A2G), or ground-air (G2A). These links have been analyzed against each other as well as against ground-ground (G2G) links. It has been stated that these links have to be modeled differently due to their distinct channel characteristics, which affects the supportable network related QoS, and hence the sustainable traffic on each type of link. The wireless channel is also affected by elements in the 3D space, which corresponds to the terrain over which the drone is flying, along with the number of obstacles in the space. The high mobility of the devices in 3D space is also important to consider, since antenna orientation, and hence link quality fluctuates widely with mobility.

Mobility: In many application scenarios, the aerial devices can facilitate time efficiency due to their high mobility. Due to this high mobility, however, the terrain over which the drones are flying is expected to change very frequently. Not only do terrain-induced blind spots affect the wireless channel, but they may also introduce frequent topology changes amongst multiple devices that require connectivity (drones, ground clients, and base stations). High mobility is also a characteristic of VANET, however, VANET mobility models follow restricted routes in 2D, for example, highways and roads, whereas aerial devices are characterized by the demand for mobility in 3D space. Thus, not only may the terrain over which the drones are flying change frequently, but also the altitude of flight may have to be varied to avoid obstacles and collisions.

Multi-drone Network: Early uses of drone were characterized by use of a single large drone for a task. In these systems the drone based communication network, therefore, consisted of just one aerial node and one or more ground nodes. Today most public and civil applications can be carried out more efficiently with multi drone systems. In a multi-drone system, the drones are smaller and less expensive and work in a coordinated manner. In most multi-drone systems, the communication network, proving communication among drones and between the drones and the ground nodes, becomes an important constituent. These drones can be configured to provide services co-operatively and extend the network coverage by acting as relays. The degree of mobility of drones depends on the application. For instance, in providing communication over an earthquake struck area the drones would hover over the area of operation and the links would be slow dynamic. As opposed to this, applications like agriculture or forest surveillance require the drones to move across a large area and links frequently break and reestablish. The dynamic nature of the network configuration and links is apparent from the fact that the drones may go out of service periodically due to malfunction or battery drainage. This is true also for drones that need to hover over an area for relatively long periods. New drones have to be launched to take their places. Sometimes some of the drones may be taken out of service to conserve power for a more appropriate time. It would, therefore, be a requirement that in all such cases the links should automatically reconfigure themselves.

Drone being used for agricultural purposes
Pic Credits : MarketWatch

Drone being used for aerial views
Pic Credits : Pexels

Drone being used for surveillance
Pic Credits : Liberation Champagne

ADIEU

Nishit Dabi — B.Tech. 2018
Pranav Thombre — Dual Degree 2018

The Department of Computer Science and Engineering, IIT (ISM), Dhanbad celebrated its Annual Farewell Program for the 2017 batch on May 01, 2017 at GJLT. Excitement gripped the final year students as they prepared to depart from this institute, remembering all the moments that they dearly cherished over the last few years of their life. The onus for organising this event was on the pre-final years.

The festivities began, with the pre-final years greeting their seniors at the gates of Sapphire hostel, bringing along a musical ensemble of 'dhol' players. The atmosphere was electric, as the final years exited their hostel decked in traditional attire. The music resounded against the hostel walls as the departing students gathered at the gates. When all the final years arrived, the procession started making its way to GJLT, where the function was to be held, stopping at Rosaline on the way. The students danced with vigour and enthusiasm, trying to match the beats of the 'dhol'. Thoughts about the future were put on hold, as the final years danced to their hearts' content. The procession took almost an hour's time to reach GJLT, where everyone was eagerly awaiting their arrival. As the procession arrived, some enthusiastic teachers joined the revelry. It was a sight to behold.

The event started at 6 PM. The interiors of GJLT were beautifully decorated for the occasion. The hosts for the evening were Ayush Khandelwal and Abhishek Dubey, both third year B.Tech. students and Komal Singh, a first year M.Tech. student. The event started off with a bang as Aishwarya Raimuley enthralled the crowd with her musical performance. The honourable HoD, Prof. P. K. Jana then addressed the gathering and shared his experiences. He then presented the graduating students with mementos so that they could cherish the time that they spent in this institute. This was followed by an impromptu karaoke by Rajesh Kumar Sinha. This saga of beautiful displays continued with Imam Khurshid's soulful flute performance, and Rakshit Parikh's power packed song. The highlight of the night was the mimicry event where the juniors tried to enact their seniors, which brought a smile on everyone's face.

These brilliant performances were punctuated by the distribution of mementos and short speeches by the faculty members. They spoke about their fond memories pertaining to the passing out batch. The students listened intently as they inculcated the wisdom that was being passed down to them. Towards the end, the prizes for 'Code Marathon', 'Quiz Wiz', and 'CodeRush' were distributed. This joyous evening was concluded by an address by Maheswara Reddy, the Secretary of the CSE Society.

STUDENT ACTIVITIES

Ashish Verma B.Tech. 2018
Vaasudev Narayanan B.Tech. 2018

Computer Science and Engineering Society

CodeMarathon 3.0:

The Department of Computer Science & Engineering in collaboration with the **Class of 2008** and CodeISM conducted the third iteration of the annual month long competitive coding competition - Code Marathon. The problem setters for the event were Digvijay Singh, Jayant Sharma, Abhishek Jaiswal and Deepak Kumar. The event comprised of three Divisions - one for the final years, third years and alumni, one for the second years and one for the first years as usual. A large number of students participated from their respective divisions.

The winners were:

Division 1:
1. Ashish Kumar
2. Vaibhav Goyal
3. Rajesh Kumar Sinha

Division 2:
1. Harmandeep Singh Kahlon
2. Anupam Wadhwa
3. Ayush Kumar

Division 3:
1. Ankur Dua
2. Saurav Chirania
3. Srijan Kumar Jaiswal

Quiz-Wiz v4.0:

The Computer Science and Engineering Society (CSES) organized the fourth edition of its quizzing event, Quiz-Wiz v4.0 on 4th February, 2017. The quiz was organized to test the technical knowledge of the students and as a means to encourage students of different years to interact with each other. To make things interesting this time around, teams had to create questions on the fly from a newspaper in one of the rounds.
The winners were:

First Position:
- Deepak Bhagat
- Soham Satyadharma
- Saurabh Saraswat
- Mohit Tripathi

Second Position:
- Parichaya Walia
- Bhargav Parsi
- Pranav Thombre
- Rutika Moharir
- Revats Bhargava

Third Position:
- Anupam Kumar
- Suraj Kumar Oraon
- Ritik Kumar Agrahari
- Aman Raj

ACM IIT (ISM) Dhanbad Student Chapter

Ode De Code 6.0

Ode De Code 6.0, the biannual competitive coding competition conducted by the ACM IIT (ISM) Student Chapter was organized on 10th Feb, 2017. It was divided into three categories: The first division for 3rd and 4th year students, the second for 2nd year students, and the third for 1st years. In the first division, Vaibhav Goyal stood first; while Harmandeep Singh Kahlon and Ankur Dua aced the second and third divisions respectively.

T-Shirt Design Contest

We at ACM IIT (ISM) Student Chapter wear our pride on our sleeve. A T-shirt design contest was conducted between 18-23 Mar, 2017 in which members of our chapter could submit their design ideas for a chapter T-shirt. From the myriad of submissions, the one that stole our hearts was Rajat Jain's, who stood first in the event.

Special Interest Groups

ACM IIT (ISM) Student Chapter decided to raise the bar and take a special interest in the extremely diverse world of Computer Science by setting up four SIGs (Special Interest Groups). SIGs are a cohort of like minded members who wish to work in a particular field, and may discuss, learn, make and break (breaking allowed only for codes). As of yet, our SIGs deal with Mobile App Development, Web Development, Machine Learning, and Cryptography and Cybersecurity. With astounding participation even from our freshers, we seek to expand our niche to be as deep and diverse as possible and impart all the knowledge we can to our members.

PowerPuff Coders 3.0

While sports may bridge the gap between nations, we believe that code can bridge the gap between the genders, because as they always say, "Anyone can code!". ACM IIT (ISM) Student Chapter conducted a competitive programming contest exclusively for our female comrades on 3rd April, 2017. In the two categories, Anushka Jaiswal stood first among the UG First year students; while among the remaining UG, PG, and JRFs, Harshita Mrityunjay grabbed the first place.

CONFLUENCE

Soham Satyadharma B.Tech. 2018
Pranav Thombre Dual Degree 2019

Confluence 2017, the annual CSE alumni meet, was organized by the Computer Science and Engineering Society (CSES), Department of Computer Science and Engineering, IIT (ISM) Dhanbad on 10 June 2017 at the Octave Hotel, Sarjapura Road, Bengaluru. On behalf of the department, Dr. Chiranjeev Kumar, Dr. Amgoth Tarachand and about 50 undergraduate students were present. 51 alumni, starting from B. Tech 2007 to B. Tech. 2017 were also present. The motto of the event was Reconnect, Reunite, Reminisce, and as always, it aimed to strengthen the alumni base of the department and bring them under the giant umbrella of CSES.

The event was initiated with a presentation by Dr. Tarachand. Referring to established alumni programs of prestigious institutes like Massachusetts Institute of Technology and Stanford University, he reiterated the motto of the event. He said that just like confluence meant the joining of two rivers, the event was supposed to be a meeting between the alumni and the department. He brought to light the struggles faced by the students to convert the institute into an IIT and congratulated everyone involved in the process.

Dr. Tarachand stated that the society was committed towards encouraging skill development and team work among the students of the department through various technical and cultural activities like Confluence itself, *BufferedReader*, CodeISM, Udbhav, and other events. He specifically elaborated on Udbhav, the Annual Day celebration of the department and cited that the Alumnus-of-the-Year and Company-of-the-Year awards are presented in the event. Considering the conversion of the institute into an IIT, he also wanted the gathering to suggest a change in name of CodeISM. He read out a message from Prof. P. K. Jana, the founding and the current president of the society. Prof. Jana, who was unable to attend the event, expressed his happiness that the event could be organized successfully, welcomed all the alumni and finally thanked Dr. Kumar, Dr. Tarachand, and the students for making the event a success.

Introducing all the faculty members of the department, Dr. Tarachand waxed lyrical about the improving facilities for research and development in the department. Harping on industry-academia collaboration, he wanted each alumnus to mentor a group of students, mentioning the positive impact such an arrangement would have upon the careers of students. He concluded his presentation by explaining the concept of alumni ambassador – an alumnus who would be the point of contact between his company and the department.

Mr. Ashay Sinha of B.Tech. 2016 then took to the stage to present the idea of the department sponsored medal. This medal would be awarded to candidates not on the basis of their GPA, but on the all-round profile of the student. Factors such as the student's research contribution, participation in extra-curricular activities, developmental skills, and contribution to the department would be considered while awarding this medal. Mr. Ashay Sinha iterated that the introduction of this award would encourage the students to build a better all-round profile. This novel idea was met with acclaim from the audience.

The event then proceeded with an address by Dr. Chiranjeev Kumar. He thanked the M.Tech. alumni for making their presence felt for the first time in the event. Saying that the industry sector has advanced a lot over the last few years, he hoped for support from alumni towards the growth of the department. He implored the alumni to remain in contact with the students in whatever capacity they could, and suggested regular skype sessions as one such method. He echoed the need to have a GPA of 7.5 as a qualifying criteria for the sponsored medal, but assured the gathering that students will be fairly evaluated on the decided parameters and GPA will be not be a judging criteria. He wanted to make the medal into a reality and hoped that a common consensus on the evaluation criteria could be reached as soon as possible.

He also mentioned the existence of SARC – the Student Alumni Relationship Cell, and hoped that it would serve as a portal for important communication between students and alumni. He declared that as per tradition, Code Marathon, the annual coding competition organized by CSES, would be sponsored by the B.Tech. batch of 2009 this year. Announcing his responsibility as the new Professor in-charge of Training and Placement of the institute, he said that the placement season would start from December 1 as per IIT council regulations and wanted the alumni to help in getting as many industry contacts as possible. He concluded by yearning for more core electronics companies to make their presence felt during the placement season.

The event continued with the alumni recounting their favorite memories from college days. Mr. Anurag Anand of B. Tech. 2007 said that back in 2004, Infosys was the first company to come for campus placements and remembered how overjoyed the students were back then when Infosys registered for placements. He was amazed to see the improvement in the department, and was at a loss to understand how almost 100 students got placed straight out of college. Mr. Dhirendra Kumar Singh of B. Tech 2008 continued from where Mr. Anand left off, saying that when he came to the institute for campus placements with Flipkart, the students were so good that he had to reach out to the vice president of the company to increase the number of students recruited. Mr. Hind K. Geel of B. Tech 2015 remembered the days when he was a part of the editorial board of *BufferedReader* and said that it was heartening for him to see the magazine reach greater heights with every passing edition.

Mr. Ankit Agarwal, B. Tech 2016, added to the air of nostalgia that had gripped the evening and remembered the way he used to run to attend classes every morning for fear of missing his attendance. Mr. Abhinav Goyal, B. Tech 2016, recounted that college life was indeed a lot of fun for them. Mr. Jitesh Karamchandani, B. Tech 2016, said that the department was always supportive when it came to organizing activities and hoped that it would continue the same in the future too. Mr. Ashay Sinha, B. Tech 2016, recounted how useful the lectures were in college and said that he learnt a lot from them. Mr. Nikhil Mittal, B. Tech 2016, reiterated the same and also reminisced the various activities organized by the department.

After the nostalgic tales of college life, the organizing team of Confluence 2017 brought the event to life with a game. The audience was divided into teams and each team was given five keywords related to Computer Science. The teams were supposed to make the other teams guess their keywords in three words or less. A photography session followed and the event was brought to a conclusion by a vote of thanks by Mr. Maheswara Reddy, the Secretary of CSES. ▪

Dr. Chiranjeev Kumar addresses the gathering.

Every parting gives a foretaste of death,
Every reunion a hint of resurrection.

In Conversation With

Mr. Vishnu Sharma is an alumnus and the Gold Medallist of M.Tech. Batch of 2006. He is currently working at Google USA. He talks about his life and career with Maheswara Chennuru Reddy, DD batch of 2018 and Monosij Ghosh B.Tech. batch of 2019 and shares his experience of the journey to Google.

*IIT (ISM) Dhanbad was then called ISM Dhanbad.

Let's start with the old times, sir. You must miss ISM a lot. How has life been since you graduated?

Well, I really miss my ISM days. When we were in ISM, we were in the learning phase. But when we came out to the corporate world; we were burdened with responsibilities, which can be tiresome at times. I really miss the Ramdhani chai. You know, it's not much fun once you get out. [laughs]

Is there something you wish you had done differently at ISM ?

In college, we are only able to see the small picture, like scoring good marks, and getting an A+ etc. But now, looking from this perspective I think that I should have done more computer application based projects. I personally believe that ISM can do much better than other engineering colleges as we have technical as well as earth science branches together. You know that natural resources are declining, and we need superior technologies in this perspective. So a CSE student can team up with an earth science guy and come up with something really innovative. If you ask me, I would go back and do just that. ISM can definitely contribute a lot in this sphere.

How is Google different according to you? And how is the US software industry different than that of India?

Google is a very different company which trusts its employees a lot. You get access to all the databases and code from the joining date. Everyone is encouraged to express their views; and the company makes sure that it pays attention to those ideas. The workplace is also well balanced where you can work on your ideas individually without a chain of approvals.

Indian IT industry is largely service driven. Hence very limited or no proper opportunities are provided for fresh graduates in India to come up with their ideas and build a product on their own. The huge gap that existed is diminishing as the current startups are focusing more on product based services than acting as mere service providers, and also trusting new talent. At the same time, giants like Amazon, Google, Facebook etc are also growing in India. Today, India has no less impact and opportunities than the USA or any other country.

Sir, how did the education you received at ISM help you? Did you find anything lacking?

ISM really helped me build my foundation and helped a lot in my career. But unfortunately, when I was in ISM, the CSE department was in its early days. Our professors helped us a lot but we did not receive much practical exposure as labs were limited and there was a lack of resources. We did not receive any exposure to the industry as most seminars were held for other earth science departments. But one time, at one such seminar, I got a chance to interact with the IT commissioner of Dhanbad who offered me a job of developing a software for them. I worked with a few B.Tech. students and we received 10000 rupees for that. So you can see, it's kind of bi-directional. We cannot always blame the department. Sometimes we ourselves have to put in an extra effort and explore the various opportunities. It will be beneficial for the juniors if they can build on the work done by their seniors, and it is of prime importance that such a culture is incorporated.

As an alumnus, how do you wish to contribute to the development of the college?

I agree that as alumni, we are not doing enough for the department. I am not ashamed to accept that. [laughs]

But we can definitely do a lot. Like, the students are not much aware of the life as a Computer Science engineer after college. So we can organize some sessions with them where we tell them about our experiences and the challenges we faced. Hopefully, they will get motivated by the success stories and aspire towards doing something great.

Apart from that, we can also contribute to the department in the form of funds and better equipment or study material.

The most important thing we can do is to guide them to the various career paths that they can venture into. Also, we can tell them about the different fields of technology where they can apply their innovative ideas and do something unique and valuable.

What pushed you to come into the software industry?

Well, my story is peculiar; it's kind of planned by God for me. All my childhood I dreamed of joining the Indian Army and made my career plans focused on that- I tried for NDA and CDS. Later, I decided on CSE upon learning that the Army needs lot of computer engineers and eventually did my post graduation in it. I came to know about Google after joining IBM; and everything changed when I joined Google. I was introduced to the huge world of complex software engineering problems and was intrigued by it and continued in this field. Now I am doing the work that I enjoy the most. I was planning to fight at the front-lines of war, while God planned even better and pushed me into fight with lines of code[laughs].

How did M.Tech. from ISM help in the corporate world?

Well, you know the prejudices that exist in our society. We tend to judge a student even before meeting him. Like IITians are considered far superior to any other student. So M.Tech. from ISM helped me break those barriers.

Also, ISM gives you a platform to reach out to the global players. Our college is really visible in the corporate world and thus your resume can get shortlisted easily compared to other colleges. And once your CV is shortlisted, the ball is in your court.

Like in my case, IBM demanded a minimum of 60% marks throughout the academic records. Unfortunately, I didn't have that but it didn't matter as my ISM M.Tech. degree weighed much more. So ISM really helped me break these barriers and stigmas.

Apart from that, during my time we had visiting faculties from IIT Kharagpur. They were really great teachers and changed my perspective on the subject. They helped me strengthen my fundamentals which helped a lot in my career.

TECH MILESTONES

Soham Satyadharma B.Tech. 2018
Vaasudev Narayanan B.Tech. 2018

Taxi, anyone?

Uber's self-driving autonomous cars have started picking up passengers in Pittsburgh. In the first stage of testing, the cars still require a person to monitor their progress and ensure that there are no issues. An engineer will be in the driver's seat to get things started and make corrections if the car makes a mistake. Notably, the drivers are supposed to keep their hands loosely on the steering wheel so that they can takeover at a moment's notice.

Read My Lips

Lip reading is a way of understanding speech by interpreting a person's lip movement. However, human speech is highly complex and nuanced, where one lip movement could correspond to different phonemes, or basic units of sound. A new AI lip reader has been built to process whole sentences at a time, allowing the AI to teach itself the letter corresponding to each slight mouth movement.

LipNet was 1.78 times more accurate than human lip readers in translating the same sentences.

To Infinity and Beyond

Famed theoretical physicist Stephen Hawking and Russian billionaire Yuri Milner announced their collaborative venture 'Breakthrough Starshot' — an attempt to make an interstellar starship. It involves designing and building 'nanocraft', a tiny spacecraft attached to lightsails, which use the power from gigawatt-scale laser arrays to reach speeds upto 1.2 times the speed of light.

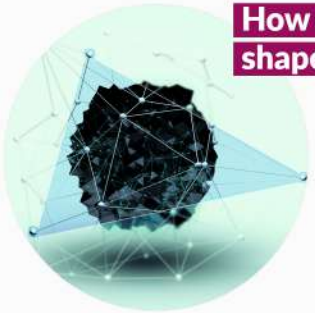
The Future of Home Delivery

Convenience store '7-11' announced that it has conducted 77 deliveries using drones in Reno, Nevada. The chain, which is owned by Japan-based Seven & I Holdings Ltd., said it has partnered with Flirtey, a Reno-based drone delivery company, to make the deliveries. The delivery record is quite impressive since it took place in a densely-populated urban area.

When I get older I will be stronger

'Development of Robot-Enhanced therapy for children with Autism-spectrum disorders' (DREAM) is a project undertaken by researchers at the University of Portsmouth, UK. It aims to help children fight autism, in ways that humans fail to. It will develop robots that will help therapists improve the patient's social interaction skills; and after a certain point, minimize the contribution of the therapist in the process.

How molecules take the shape they do



MIT is at it again. Researchers at the esteemed institute have been working on a system that predicts the major product of a chemical reaction with 72 percent probability, and ranks the top three possible major products with 87 percent probability. This system is expected to eliminate the need to perform laborious experiments while dealing with exceptions. The basic idea behind this system is that the user will name a product, and the system will let the user know the different routes of making the required product.

Google here, Google there, Google everywhere

Collaborating with 'Tri Alpha Energy' of the Californian ranches, Google has entered the field of nuclear fusion. Google Research has developed an algorithm, queerly named Optometrist, which combines high-powered computation with human judgement to solve the challenging problems that nuclear fusion presents. In a classic case of humans and computers working in tandem, Optometrist has resulted in a 50 percent reduction in energy losses and a boost in the total plasma energy.

A New Dimension

Researchers at Purdue University have developed a technique that uses machine learning to develop three dimensional bodies from two dimensional images. Named SurfNet, it is expected to revolutionise the fields of 3D surfing, robotics, and self driving cars once fully developed. It is already more accurate and precise than current deep-learning based 3D methods.

सच्ची बात

मैं किसपे इतना गुमान करता हूँ
न ये जमीं मेरी ना ये आसमां मेरा
कपड़े दर्जी बुनकर के खाना किसान मजदूर का खाता हूं
इस मिट्टी में जन्म लिया इस मिट्टी में मिल जाता हूँ
अक्सर यही सोचता हूँ मैं किसपे इतना गुमान करता हूँ

ये जिंदगी की उच्चाइयाँ फिकी सी लगती है
ये शानो शौकत ये शोहरत चुभता है मन में
जब जब मैं उन मलिन बस्तियों से गुजरता हूँ
नंगे पाँव प्यासी निगाहें उन बच्चों को मंडराते देखता हूँ
अक्सर यही सोचता हूँ मैं किसपे इतना गुमान करता हूँ

हमारा देश बहुत महान है कई वीर गाथाएं यहाँ की
इसकी आधारशिला उनके आँसू पसीने रक्त से रखे गए
बहुत दर्द होता है जब लोग इसे धिक्कारते है
विदेशो में बसकर खुद को भारतीय कहते हैं
खुद बदल नही सकते और बड़ा बदलाव चाहते है

न जाने में कब कब किस किस को ये कहता हूँ
अक्सर यही सोचता हूँ मैं किसपे इतना गुमान करता हूँ

वृद्धाश्रम का कैसा चलन माँ बाप कभी भगवान थे यहाँ
गुरुर ब्रह्मा के देश मे शिक्षा आज व्यवसाय बना
अन्नदाता अलंकार से सुशोभित किसान आज लाचार हुआ
धरती माँ चंदा मामा हुए जहाँ आज जीना वहाँ दुश्वार हुआ

ये सब कोरी कल्पना नही सच्ची बात बताता हूँ
अक्सर यही सोचता हूँ मैं किसपे इतना गुमान करता हूँ

Pramod Kumar Modi B.Tech. 2018

Buffered Designers

Contact Us

briitdhn@gmail.com
www.bufferedreader.org

Buffered Writers