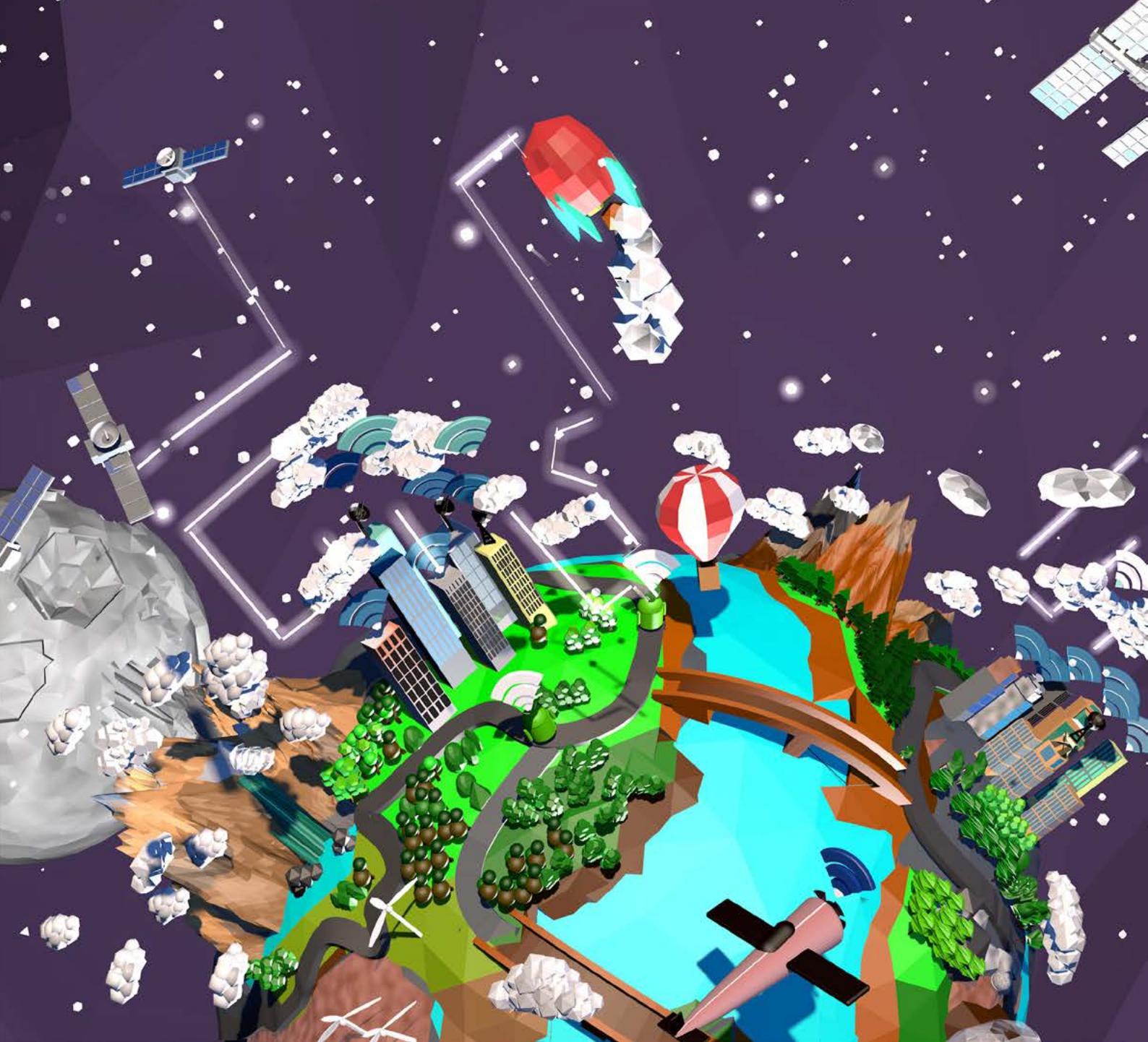


AUG  
2015

# BUFFERED READER v2.1

## AN INSIGHT INTO CSE



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# FOREWORD

“ Every accomplishment starts with the decision to try.



Dr. Chiranjeev Kumar

After the successful release of the first two editions of BufferedReader, the Editorial Board has come up with the third edition of the magazine. The class of 2015 had contributed to a great extent towards the first two editions and now the baton has been passed on to the class of 2016. I hope that you have enjoyed browsing through the previous editions. This magazine is a testament of the students' will to take up interests apart from academics, allowing them to foster their all-round growth.

The current edition has a myriad of articles. The cover story provides the readers an insight into the Internet of Things. In today's world, there are an increasing number of seemingly normal devices that are generally embedded with chips which help to transmit the given information to a server where it is processed. This revolutionary technology is creating opportunities for more direct integration between the physical world and computer-based systems, resulting in improved efficiency, accuracy and economic benefit. In addition to this article there are several others which give the reader an overview of various events conducted by the Department.

The main objective of the Department is to encourage each student to develop as an independent and creative thinker, ensuring their intellectual, ethical, and social development, so that they can cope up with the pressures and demands of today's competitive market. To ensure that the magazine has a wider reach, the editorial board has come up with the online version on 21st April, 2015. You are most welcome to read and download the magazine from [www.bufferedreader.org](http://www.bufferedreader.org). I personally believe that this is a great initiative that has been undertaken by the students. The readers can view BufferedReader on their handheld devices as well.

I wish to convey my gratitude to my faculty colleagues and to my students whose immense contributions have helped in compiling the 3rd edition of BufferedReader. I applaud the contributors for their stimulated thoughts which they have expressed by the means of their articles.

The quality and content of BufferedReader will improve only after we receive honest and frank feedback from your end.

Well, till then, Happy Reading! •

# THE EDITORIAL

The unknown has bestowed upon us, we the insignificant earthlings, the invaluable gift of reading and writing. But to channelize the random, chaotic and spontaneous burst of thoughts in the human mind and to pen it down is nothing but beautiful. The true elegance though, lies in letting others experience the bliss of understanding and getting inspired by your wonderful ideas and we at BufferedReader are making a humble effort in doing just that. The booklet that you are holding in your hands is the culmination of a lot of hard work, dedication, expertise and the copulation of words and art and not to mention the long hours we have put in our productive meetings. We appreciate the effort you are taking to understand the worth of our work. BufferedReader presents you the third edition of its kind!

BufferedReader today is the face of the Department of Computer Science & Engineering at ISM. A significant chunk of the credit goes to our beloved seniors. Everything has a Step 1. You just have to take it. Taking the first step to do anything is nothing short of a monumental task. You have to face the chide and the ridicule of lesser mortal souls and at the same time live with the uncertainty of the success of your endeavour while refraining yourself from ever so slightly believing in their unfortunate musings and mockery. Yes, our seniors did all of that and look where we have landed. At its genesis, nobody thought that BufferedReader would even be able to ascend the mountain on which it is sitting on top of, right now. From the quality of the content to the beauty of its 'eyegasmic' portrayal, this magazine has

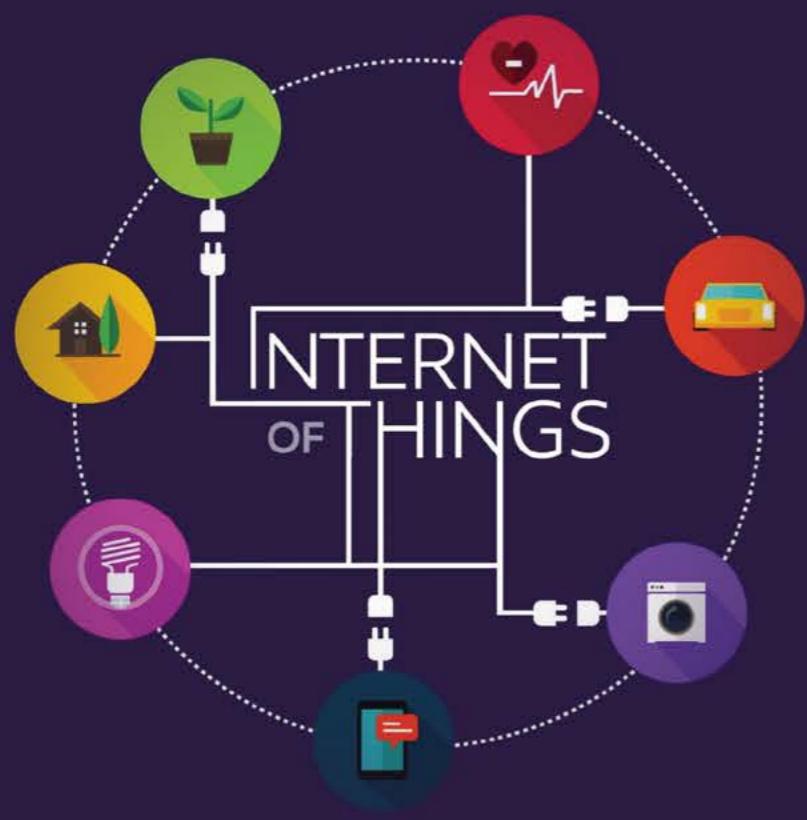
come a long way. The knowledge that we have acquired from our seniors is something that cannot be put a price on. And to be frank, it's been quite a challenge to bring out the third edition without their help. With a heavy heart, we say goodbye to our seniors and wish them luck for their future endeavors. To get to some place, you have to leave the previous place and we aren't selfish enough to not let them go. Are we saddened by their departure? A tad, yes. But we can't let that overpower us, can we?

There is always infinite scope for improvement. The fool didn't know it was impossible, so he did it they say. We are humble enough to call ourselves fools and are unafraid to achieve the unknown impossibilities in store for us. The show must go on and unfortunately it has to, without our seniors.

This edition we introduce you to concept of the Internet of Things or more commonly referred to as IoT. When literally every little thing that you can see or even perceive is connected to a common framework, it goes without saying that you ought to give that article a read. As viruses and bacteria are constantly evolving and developing a strong resistance to all of our pharmaceutical efforts, the HoD of our department introduces an avenue which has a lot of potential, Futuristic Healthcare.

We hope you like our effort. Happy reading! •





Ashay Sinha  
Parichaya Walia

“

*In the next century, planet earth will don an electronic skin. It will use the Internet as a scaffold to support and transmit its sensations.*

-Neil Gross, 1999

Connect | Transform | Reimagine

**D**eath, destruction, devastation. Three words that the generations to come would be using to summarize the wars of history. On a deeper thought, there is more to it under the table, than there is upfront. The post World War II era of political and technological stress that later came to be referred to as the “Cold War” is one of the pages of history that cannot be overlooked. Bifurcation of the globe into the Eastern and Western Bloc, with each sides betting much of their resources on the best of their countries’ minds, that were solely driven by the insane zeal of gaining hegemony. Somewhere in between this rat race without a finish line, there was the need for a more effective mode of transmission, storage and retrieval of highly confi-

dential data. All thanks to the competitiveness amongst one another, this is how the internet came to existence.

The internet, as we know it today, is a massive global network that allows people to communicate with their devices, as well as with each other. Conventionally speaking, it is the users, the client devices and the servers between which the data flows. But a whole new category is being added up, that in a very unglamorous and casual way, can simply be referred to as “things”. Simply put, a “thing” is any object with an attached sensor capable of monitoring and transmitting a particular type of data further up into the cloud where it could be analyzed and put to use. From kitchen appliances, to automobiles; from scientific appliances like odometers,

to monitoring disasters; and far beyond- all these objects that surround us today can be classified into these “things”.

Judging by the transforming curves of mankind’s needs, and even their uncanny intellect reflected upon the arrival of the concept of the internet in this world eventually, if not anytime sooner. But what had been much unanticipated, was the interaction and communication of not just people, but also daily life objects with one another through internet. With every passing day, more and more IoT devices are being launched into the market. So much so, that Samsung Co-CEO declared at CES 2015 that by the year 2020, 100 percent of their products will be “Internet of Things” enabled. It is safe to assume by now that there are much more “things” on the Internet, than the actual number of people alive in this world to use them. As a consequence, the total amount of global data flow is unimaginable. As rightly put by Dr. John Barret when asked about this digital world of information, he mentioned the current cloud of data is estimated to be around 4000 Exabyte, which is analogically equivalent to “a stack of books from Earth to Pluto, and back, 80 times”. Much of this is owing to the increasing establishment of network between everyday objects.

The concept of a network of smart devices was discussed as early as 1982, with a modified Coke machine at Carnegie Mellon University becoming the first internet-connected appliance that was able to report its inventory and whether newly loaded drinks were cold. In 1994, Reza Raji described the concept of Internet of Things as moving small packets of data to a large set of nodes, so as to integrate and automate everything from home appliances to entire factories. Between 1993 and 1996 several companies proposed solutions like Microsoft’s at Work or Novell’s NEST. However, only in 1999 did the field start gathering momentum. Bill Joy envisioned Device to Device (D2D) communication as part of his “Six Webs” framework, presented at the World Economic Forum at Davos in 1999.

The concept of the Internet of Things first became popular in 1999, through the Auto-ID Center at MIT and related market-analysis publications. Radio-Frequency Identification (RFID) was now being seen as a prerequisite for the Internet of Things. If all objects and people in daily life were equipped with identifiers, computers could manage and inventory them. Besides using RFID, the tagging of things may be achieved through such technologies as near field communication, barcodes, QR codes and digital watermarking.

In its original interpretation, one of the first consequences of implementing the Internet of Things by equipping all objects in the world with minuscule identifying devices or machine-readable identifiers would be to transform daily life. For instance, instant and ceaseless inventory control would become ubiquitous. A person’s ability to interact with objects could be altered remotely based on immediate or present needs, in accordance with existing end-user agreements.

The Internet of Things revolves around increased machine-to-machine communication; it’s built on cloud computing and networks of data-gathering sensors; it’s mobile, virtual, and instantaneous connection; and they say it’s going to make everything in our lives from streetlights to seaports “smart.”

So much of the chatter has been focused on machine-to-machine communication (M2M): devices talking to like devices. But a machine is an instrument, it’s a tool, it’s something that’s physically doing something. When we talk about making machines “smart,” we’re not referring strictly to M2M. We’re talking about sensors.

A sensor is not a machine. It doesn’t do anything in the same sense that a machine does. It measures, it evaluates; in short, it gathers data. The Internet of Things really comes



# THE RISE OF THE INTERNET OF THINGS

HOW MACHINE-TO-MACHINE (M2M) NETWORK CONNECTIVITY

IS DRIVING THE GROWTH OF INDUSTRIES



together with the connection of sensors and machines. That is to say, the real value that the Internet of Things creates is at the intersection of gathering data and leveraging it. All the information gathered by all the sensors in the world isn't worth very much if there isn't an infrastructure in place to analyze it in real time.

Cloud-based applications are the key to using leveraged data. The Internet of Things doesn't function without cloud-based applications to interpret and transmit the data coming from all these sensors. The cloud is what enables the apps to go to work for us anytime, anywhere.

Speaking of structural aspects of the IoT technology, the small sensor at the "thing" end monitors a particular change in their programmed environment – like heartbeat, opening of a door, odor, etc. and either transmits this data directly to a smartphone, tablet, any other control unit; or rather sends this information to a secondary dedicated device that has an access gateway to internet, known as the IoT gateway. This data is then sent further up to the cloud from where it can be retrieved and monitored.

Contrary to the prodigiously astounding specifications of the smartphones that make use of multi-tasking operating system possessing a quad-core (or even an octa-core processor) and several gigabytes of RAM, a typical IoT device functions on a processor of just a few megahertz of frequency, and a RAM that barely ranges between 4KBs to 256

KBs. Also, much of the IoT products make use of the Low Power Operating System that saves a tremendous amount of power while performing its functions. The pretty obvious reason is that these operating systems are event driven, rather than utilizing polling, which means it avoids sampling the status of an external device by a client program as a synchronously after a specific period of time.

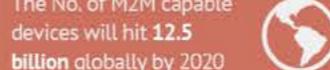
Companies like ARM are putting in best of their efforts to smoothen the road to a fully IoT enabled future. Towards the end of the year 2014, ARM announced a new operating system which it called "mbed OS" that supports all the important IoT protocols and also a variety of communication stacks like IPv4, IPv6, Wi-Fi, Bluetooth, 6LoWPAN, 2G GSM and 3G. It is aimed at boosting the development of IoT devices, and not just confining its usability to the multinational corporations, but at the same time keeping the doors opened for any individual hobbyist developer.

Today, we are seeing the electrification of the world around us. Almost any manufactured good now includes an embedded processor (typically a microcontroller, or MCU), along with user interfaces, that can add programmability and deterministic "command and control" functionality. The electrification of the world and the pervasiveness of embedded processing are the keys to making objects "smart." Your old toaster that mechanically controlled the color of your toast now has an MCU in it, and the MCU controls the color of your toast. The toaster completes its task more consis-

## Remote Management

M2M accounts for an estimated 3% of all worldwide mobile connections

The No. of M2M capable devices will hit 12.5 billion globally by 2020



## Mobile Connectivity

Each year 60 billion public transport journeys are carried out across Europe

Mobile connectivity will increase globally to nearly 12 billion devices by 2020

WIFI AVAILABLE



## Fleet/Vehicle Telematics

There are an estimated 35 million European commercial distribution vehicles

By 2016 there will be 210 million connected car systems worldwide



WARNING



ETA: 25 mins



tently and reliably, and because it is now a smart toaster, it has the ability to communicate with you electronically using its touchpad or switches. After a device becomes smart through the integration of embedded processing, the next logical step is remote communication with the smart device to help make life easier. For example, if we are running late at the office, can we turn on our house lights for security reasons using our laptops or mobile phones?

Communication capability and remote manual control lead to the next step; how do we automate things and, based on our settings and with sophisticated cloud-based processing, make things happen without our intervention? That's the ultimate goal of some IoT applications. And, for those applications to connect with and leverage the Internet to achieve this goal, they must first become "smart" (incorporate an MCU/embedded processor with an associated unique ID) then connected and, finally, controlled. Those capabilities can then enable a new class of services that makes life easier for their users.

For the network, sophisticated cloud-based processing requires a new generation of communications processors that can keep track of all of those connected devices, communicate with them and translate their functionality into useful services - all with nonlinear improvement to their performance and efficiency. The challenge will be to build secure networks that keep up with demand, while simultaneously reducing energy consumption and cost of equipment. This will require all kinds of innovations, well beyond the improvements Moore's law can deliver.

Requirements common to all the use cases of IoT include:

- 1) Sensing and data collection capability (sensing nodes)
- 2) Layers of local embedded processing capability (local embedded processing nodes)

- 3) Wired and/or wireless communication capability (connectivity nodes)
- 4) Software to automate tasks and enable new classes of services
- 5) Remote network/cloud-based embedded processing capability (remote embedded processing nodes)
- 6) Full security across the signal path.

For the sake of discussion, let us analyze a typical day spent in a world surrounded with the IoT devices: Morning begins with the gentle vibration of the wrist band, an indication of waking up. The wrist band had been monitoring the general body mechanisms like metabolism, heartbeat as well as the sleep cycle. In case there are any abrupt alterations, the user is alarmed with a notification or a mail, and the reports are automatically delivered to a medical practitioner. Otherwise, on a normal day there is an initiation of a chain of events wherein multiple IoT devices communicate with each other. The room thermostat receives the signal to turn the air conditioning off (thus saving on power), and to moderate the temperature by allowing fresh morning air indoors. Smartphone notifies the user about the bathing water being warmed up. At the same time, the kitchen toaster and coffee maker starts up. While leaving home for work, the traffic monitoring system installed in the automobile describes the traffic conditions. With just the touch of a few phone buttons, the entire housing security system gets activated.

Let us see how Internet of Things would make our lives easier, productive and hassle free in years to come.



#### Keep Streets Clean

UProducts like the cellular communication enabled Smart Belly trash use real-time data collection and alerts to let municipal services know when a bin needs to be emptied. This information can drastically reduce the number of pick-ups required, and translates into fuel and financial savings for community's service departments.

A man with glasses stands in front of a display board for SenseNET. The board shows various infographics and data points related to energy efficiency and metering. The Echelon logo is visible on a nearby booth.

## OUR CITIES

#### Keep Track of Your Assets

The OnFarm solution combines real-time sensor data from soil moisture levels, weather forecasts, and pesticide usage from farming sites into a consolidated web dashboard. Farmers can use this data with advanced imaging and mapping information to spot crop issues and remotely monitor all of the farms assets and resource usage levels.

A man in a cap and shirt is standing outdoors, looking at a device attached to a wooden post. The background shows a field and some trees.

## THE INDUSTRY

#### Maintain and Repair

Sensors installed inside equipment will monitor if any parts have exceeded their designed thresholds, and will automatically send reports to owners and manufacturers if they have. Early predictions on equipment malfunctions can be made with parts and service maintenance can be automatically scheduled ahead of an actual part failure.

A large industrial facility with various machinery and equipment. In the foreground, there is a large white cylindrical structure being processed by a machine.

#### Monitor

Smart Structures' SmartPile technology is an example in action that uses wireless sensors embedded within concrete foundation piles to ensure the quality and integrity of a structure. These sensors can provide load and event monitoring for the projects construction both during and after its completion.

#### Receive Pollution Warnings

The DontFlushMe project by Leif Percifield is an example that combines sensors installed in Combined Sewer Overflows (CSOs) with alerts to local residents so they can avoid polluting local waterways with raw sewage by not flushing their toilets during overflow events.



#### Light Streets More Effectively

This smart lighting system from Echelon allows a city to intelligently provide the right level of lighting needed by time of day, season, and weather conditions. Cities have shown a reduction in street lighting energy use by up to 30% using solutions like this.



#### Stop the Bleeding

Invisible Tracck is a wireless device being used in pilot programs to help combat illegal deforestation taking place in the Amazon. The battery operated devices are installed on select trees and as soon as the logged trees are in transit and able to connect to a mobile network (Up to a 20 mile range), an alert notification with location coordinates is sent to the Brazilian Institute of Environment so they can take action.



#### Get an Advanced Warning

The University of Loughborough's Acoustic Landslide Detector system called ALARMS (Assessment of Landslides using Acoustic Real-time Monitoring Systems), detects high-frequency stress waves produced by soil movement. They can be used to calculate soil movement in real time and send out alerts to communities before an event occurs.

## THE ENVIRONMENT

#### Track Water

The University of Berkeley's Floating Sensor Network project uses motorized drifters (Outfitted with cell communication, GPS, temperature, and salinity sensors) that can be quickly deployed in response to unanticipated events such as floods to track the movement of water, contaminants, and other conditions in waterways.



#### Help Protect Wildlife

A project by Ground Labs and Lion Guardians is creating an open source wildlife tracking collar system to safeguard the Maasai herders cattle and protect the last 2000 lions living Southern Kenya. The system consists of a tracking collar that utilizes a GPS/GSM module to locate and track the lions and communicate their coordinates to researchers and Maasai herders via SMS.

sensors proliferate, connecting everything.

With its mantra of "anything which can be connected, will be connected", the promise is that the internet of things won't just connect our homes, hospitals, schools and streets – it will enable whole new ranges of interactions, services and efficiencies. It's not just about the things, in other words – it's about the people and environments that animate them.

This wider vision of the internet of things is still evolving, with considerable excitement from tech firms, entrepreneurs and governments. But it's far from being completely realized yet. Too much of human indulgence with the IoT devices is like riding a hot air balloon in the stormy skies. Though it is somewhat possible to glide through the windless skies, winds of thunder contribute to the ease and the thrill of the process. But careful there, we never know when things might get out of hands, and lead to an eventual fall. Hence a little more caution, and a little less dependence would otherwise be beneficial. Rest all that can be done, is sitting back, and contemplating as it takes on its beautiful course of evolution. •

Irrespective of the fact that IoT would make human life easy, the future holds plenty of big challenges for the IoT, which is still in its embryonic stage. There are technological challenges related to the devices that collect and send data. Hardware and software issues include battery life, interoperability, compatibility, etc. Increasing reliability on IoT enabled devices arises a question of how far can this technology be trusted.

As humans advance from smart devices to smart homes, and furthermore to smart cities, these issues become more complex with all these devices sending data and receiving commands, it won't be long before they become a primary target of the hackers. A recent security report from Intel's McAfee labs alarms the people particularly about the IoT area as having potential to security threats. Of the 10 most popular types of IoT devices tested, 70% contained security exposures, whereas there were a total of 90% such devices that collected at least one piece of personal information. Hence, due to predicted fast growth of usage of these devices such issues are a major matter of concern.

The grand vision of the internet of things is currently an exercise in imagination. It is about what happens when more and more of the real, physical world comes online, as devices and



#### Track Your Activity Levels

Using your smartphone's range of sensors (Accelerometer, Gyro, Video, Proximity, Compass, GPS, etc) and connectivity options (Cell, WiFi, Bluetooth, NFC, etc) you have a well-equipped Internet of Things device in your pocket that can automatically monitor your movements, location, and workouts throughout the day.



#### Monitor an Ageing Family Member

Using a wearable alarm button and other discrete wireless sensors placed around the home, the BeClose system can track your loved one's daily routine and give you peace of mind for their safety by alerting you to any serious disruptions detected in their normal schedule.



#### Remember to Take Your Meds

GlowCaps fit prescription bottles and via a wireless chip provide services that help people stick with their prescription regimen; from reminder messages, all the way to refill and doctor coordination.



#### Make Sure the Oven is Off

Smart outlets like the WeMo allow you to instantly turn on and off any plugged in device from across the world or just your living room. Save money and conserve energy over time by eliminating standby power, measure and record the power usage of any device, and increase its operating lifespan through more efficient use and scheduling.



#### Track Down Those Lost Keys

You can easily track down those lost keys or cell phone in your house using Bluetooth and other wireless technology devices like the Cobra Tag.



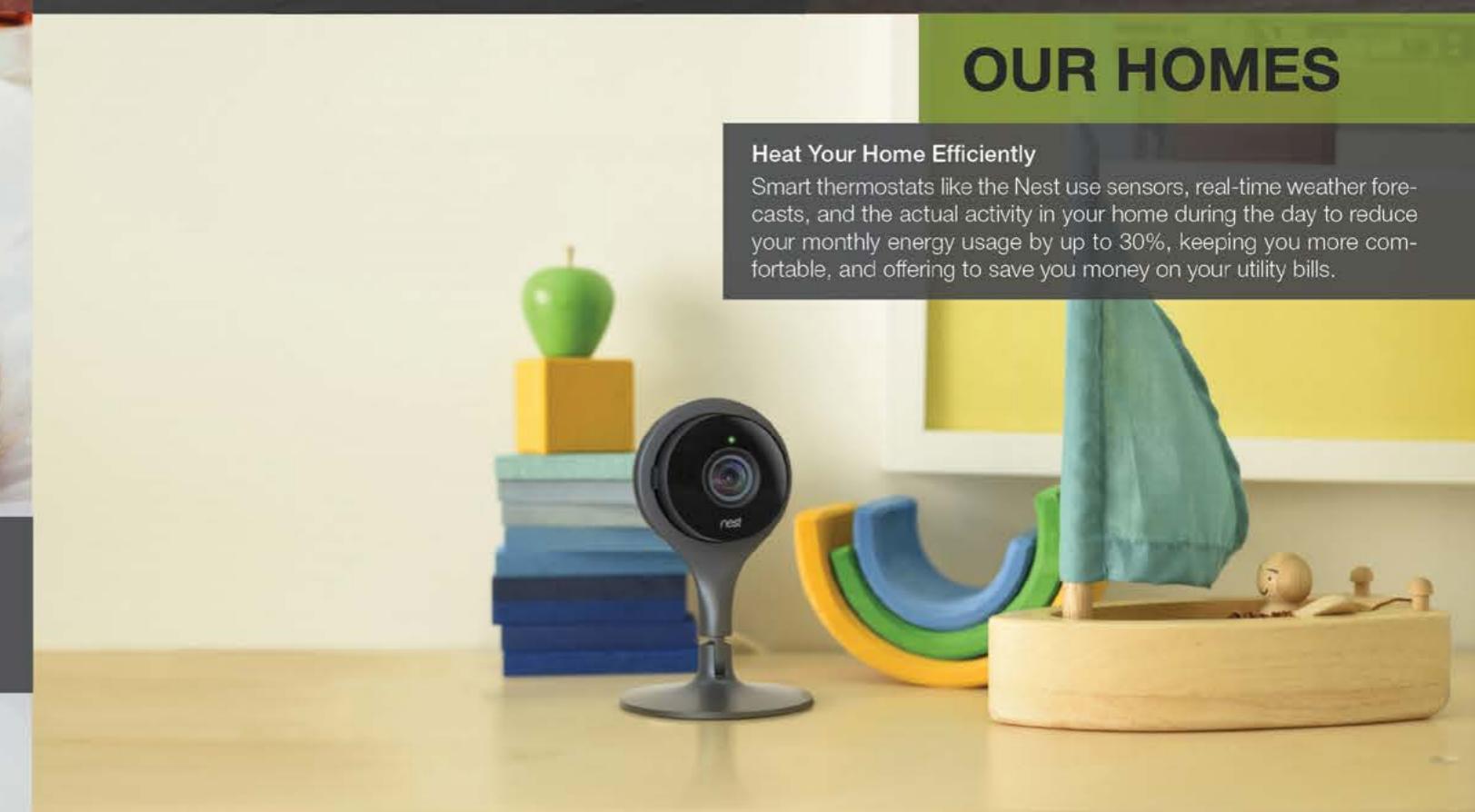
#### Avoid Disasters

Using a device like the Ninja Block and its range of add-on sensors you can track if a water pipe has burst in your basement, if there is motion inside your home while you are away, and have it automatically send you a notification by email or text message when it happens.



#### Check on the Baby

Aimed at helping to prevent SIDS, the Mimo monitor is a new kind of infant monitor that provides parents with real-time information about their baby's breathing, skin temperature, body position, and activity level on their smartphones.



#### Heat Your Home Efficiently

Smart thermostats like the Nest use sensors, real-time weather forecasts, and the actual activity in your home during the day to reduce your monthly energy usage by up to 30%, keeping you more comfortable, and offering to save you money on your utility bills.

## OUR HOMES

## THE HUMAN BODY

# CONFLUENCE

Ashish Verma | B.Tech 2018

“Remember that the most valuable antiques are dear old friends.

- H. Jackson Brown, Jr.

With smiles on their faces and nostalgia in their hearts, the faculty and students of CSE Department, ISM Dhanbad warmly welcomed our Alumni to 'Confluence-2015' in New Delhi.

The Department of Computer Science & Engineering carried on its commendable initiative to organise Confluence-2015, an interaction programme with our alumni. On behalf of the department, Dr. Chiranjeev Kumar (Associate Professor and Head of the Department), Dr. Arup Kumar Pal (Assistant Professor) and four students currently pursuing their B.Tech. participated in this event. As our alumni congregated in the Officers' Mess, Chief Engineer (Air Force), Palam, New Delhi on June 13, 2015, the hall was filled with ecstasy.

After taking a crucial step in calling this meeting, Dr. Chiranjeev Kumar opines that alumni can contribute to the Department significantly to accomplish what it yearns. Ranging from parameters like placement and internships to the counselling of young technocrats in preparing

and pursuing of an apt career, alumni have been a great help since time immemorial. With the guidance of our alumni, the students of CSE have exceeded expectations. Hence, the main purpose of the programme was to reinforce the alumni base of the Department and to bring alumni under the giant umbrella of CSES.

The hall swarmed with people consisting of graduates from 2008 to present. There were a plethora of gleeful faces who felt delighted after meeting their batch mates.

But this was not just a wanton gathering; it was a meeting which reinforced an overall development of department. Greeting the guests with a warm heart, Dr. Kumar moved onto the objective of the meet.

The meeting commenced and the alumni were apprised of the first alumni congregation, 'Confluence-2014' held on June 2014. Dr. Kumar highlighted the decisions taken during the event. He also delivered a presentation on the academics, current infrastructure and other facilities of the Department which include various laboratories, library, seminar hall, class rooms, JRF Halls etc.

The HOD further stressed upon the necessity of consolidating the Alumni base

of CSE and also to fortify the bond that Alumni share with the society. He ascertained that maintaining such a relationship would foster the growth of everyone the current and prospective students, the Department as well as alumni. Quizzing alumni on what they expected from CSE Department, he invited suggestions and recommendations from them. One of the alumnus proposed that the department should lay more focus on developing a practical approach towards academics.

Dr. Chiranjeev Kumar also requested the alumni to assist the department in Internship & Placement. He presented two broad options to them: either to convince their company to visit the campus for intern hiring; or to offer offline internship to at least one student per year. He proposed that the student would remain at college or his/her home during the internship and made it clear that a stipend would never be an issue. Accentuating that 20 current CSE students are doing their internship at the department itself and working on Office Automation work of ISM, he spoke to the alumni, who are working on various start-ups, to visit ISM and provide the opportunity to their juniors to work with them.



Stressing on the role of alumni, our HOD came up with the idea to have a CSE Ambassador in various companies where our alumni are working. This proposal was in line with companies like Google, Microsoft putting their ambassadors at colleges. The CSE Ambassador would be a single point of contact for all kind of communication with the company related to Internship, Placement, Talks, Contests, Sponsorships, etc. Inviting the alumni to come forward and help the department in organizing events under the banner of the CSE Society, he appreciated the efforts made by CSE 2006 Batch and M/S Ingresol for organizing CodeMarathon, a month long coding competition which received a contribution of Rs. 1.15 Lakh.

The response from the alumni was astonishing. Dr. Kumar would put forward one proposal after another and the former students would suggest modifications they believed would make the proposal more apt. He requested the alumni to contribute for the forthcoming 3rd International Conference on the Recent Advances in Information Technology (RAIT-2016) which is scheduled to be held during 03-05 March 2016. The contribution could be in the following ways:

- Deliver an Invited Talk
- Deliver a Tutorial Talk
- Attend as a Delegate (industry sponsor or self)
- Event Sponsors (like mementos, registration kit, high tea, dinner etc.)
- General Sponsor (Platinum/Diamond/Gold/Silver)

He discussed about the presence of CSE department at an International Level and informed alumni about the MoUs/Data Agreement signed with the following universities:

- University of Tunis & The Director of the National High Engineering School of Tunis (ENSIIT)
- Botho University, Botswana
- Arkansas State University, USA
- University of Glasgow, UK (Data Agreement to access GOV2 Collection for text retrieval research)

Dr. Kumar entreated alumni to help the department in establishing more contacts with foreign universities and industries. He also mentioned about the annual day celebration of the department and invited alumni to visit us during the event, mingle with the students and motivate them; and asked them to show the presence of the alumni base during this cherished day of the department.



## Mentoring Alumni

In between all the remarkable ideas, Dr. Kumar came up with an imperative proposal, that one alumnus should adopt a student or a batch and groom them throughout their academic life at ISM in whichever way they deem necessary. And he/she will act as an Industry Mentor for the student/batch to give complete exposure about the industry to them. Of all, this suggestion acknowledged the most discussion and applause.

## Proposals and Suggestions

Actively participating in the discussion, alumni came forward with numerous queries and recommendations. They proposed that apart from taking measures to improve the coding skills of students, students should get an opportunity to work on live projects. Alumni working at start-ups could provide this opportunity to the students and work like their Industry Mentors. The idea of a 6 month internship for M.Tech and dual degree students was also put forward. In order to apprise the students of the latest technology currently being used in the industry, it was endorsed that course curriculum should be changed accordingly.

## Alumni Cell

To set up a hierarchy for better contact between alumni and students, Dr. Kumar proposed to set up an Alumni Cell which comprises the following members:

- HOD acting as President
- One Alumni Representative acting to as Vice President
- Two Faculty-in-Charge
- Two student representative from PG
- Three student representative from UG

He made an appeal to the alumni to suggest names of senior alumni for the post

of Vice President. Moreover he asked all the alumni to become members of the CSE Society and to help the department to flourish and ameliorate. Our alumni accepted the proposal with open arms.

The alumni applauded the gesture by Dr. Kumar and stepped forward to help the students. It was advocated that there should be an Alumni Portal which would bring the current students and alumni under the same umbrella. Mr. Hind Kishore Geel (2015 Batch) presented a road map of the portal and consented to provide the portal in the best possible manner. Realising the profoundness and intention of the meet, and having a passion to help their department, the alumni took up the responsibility to organise Confluence 2016. This move was widely lauded. The date of Confluence 2016 was finalized as 11 June 2016 but the venue was yet to be finalised.

Lastly, alumni admired the meet as a commendable and heart touching initiative and opined that such events should be organized after regular intervals of time. At the end, Dr. Chiranjeev Kumar and Dr. Arup Kumar Pal acknowledged everyone who extended their assistance and support to make Confluence 2015 a successful event. The Department believed that the event would grow in times to come and would contribute significantly towards the growth of CSE at ISM.

Indeed, nothing is too difficult to achieve, if one endeavours earnestly. The struggle may not be resolved in a single stroke, but can always be made uncomplicated, slowly and gradually. Just an initiative is what is needed to clear away the clouds. Things become much easier, when someone is there to hold and guide us through every step towards our destination. All we need is a helping hand. •

# FUTURISTIC HEALTHCARE

engineering for health

Dr. Chiranjeev Kumar



**“** *Health is a state of complete physical, mental and social well being, and not merely the absence of disease or infirmity.*

-World Health Organization

Many people do not realize the importance of good health, and even if they do, they may still disregard it. Whether we work at home or in an office, we need good health in order to perform our duties well. Contrary to what most people believe, health does not merely mean being free from physical pain or the symptoms of any disease. In addition to physical fitness, the fitness of mind is also of crucial consideration in the overall assessment of well-being. One of the basic requirements for good health is to live in a clean and healthy environment which is almost impossible today. Be it the water we drink or food we consume, the air we breathe or the land we live upon, everything is polluted. Our cities, towns and rivers have become dumping grounds of wastes and breeding grounds of dangerous microbes. Due to all these our chances of acquiring good health may remain a distant dream. This has made a demand to move in new dimension of medical science and that is, by associating engineering with medical science. This association not only improves the living standards and general health of people, but it also saves countless lives all over the world.

In the past 50 years, advancement in medicine has mostly been due to technological advancements made possible by biomedical engineering activities. Biomedical engineering or “Engineering for Health” is one of the fastest growing fields of research and technological advancement. It is defined as the use of principles and techniques of engineering to solve problems in medical and

biological sciences in order to advance the healthcare treatment. It includes the advancement of fundamental concepts of engineering, biology and medicine to develop new devices and innovative approaches to solve health issues. This biomedical engineering has resulted in development of platform shoes, wooden teeth and limb prostheses, pacemakers, heart-lung machinea, dialysis machines, diagnostic equipment and imaging technologies of every kind, artificial organs, implants and advanced prosthetics.

## ICT Based Framework for Improving Healthcare Workflow

Information and communication technologies (ICT) have become inevitable and almost inseparable parts of our lives. They have also penetrated many application areas including healthcare.

Workflow in healthcare is a term for expressing the work in a computerized format processes which represent the flow of task in particular healthcare procedures. Healthcare procedures can be related to admission and discharge, health monitoring and advice, operation procedure, diagnostics procedure,



The integration of healthcare with ICT has led to increased accessibility to healthcare providers, more efficient processes and better quality of healthcare services. Technologies such as cloud computing, mobile technology, intelligent and decision support software, internet and web services, wireless communication etc are being used in different areas of healthcare such as hospital network, clinical services, diagnostics services, personal health, remote monitoring, tele-health, ambulatory and emergency services, health data management, etc. Use of ICT based services in healthcare has helped the user (patient or doctors) in achiev-

ing better operational efficiency related to healthcare work flow. There are many areas in healthcare like hospital interoperability, healthcare/hospital document workflow, home healthcare, remote health monitoring, e-Health, m-Health etc which need use of advanced ICT to improve work flow related operational efficiency. ICT is being used in some of these areas; however it is still not matured much.

## Research Issues & Challenges

Cloud computing is the delivery of computing as a service rather than a product, whereby shared resources, software, and information are provided to computers and other devices as a utility over a network/Internet. If used together with other technologies such as mobile, wireless/Wi-Fi, web services, it may just be the right technology for healthcare infrastructure. However, several serious issues concerning security, data storage, protection and ownership, quality of services, and mobility need to be resolved before Cloud computing can be widely adopted in healthcare. Mo-CAsH is one of such example which uses mobile and cloud connectivity of healthcare.

Interoperability is the ability of two or more systems or components (e.g. two or more healthcare information systems) to exchange information and use the information that has been exchanged. This information exchange can be based on some health standards like HL7 and Clinical Document Architecture. Handling interoperability issue in medical systems is a mandatory requirement, as they support existing legacy system in healthcare. Electronic health record (EHR) system plays a bigger role in health data interoperability.

In the last five years, a lot of research results have appeared on various topics of healthcare ICT, that includes – ICT based connected health services and healthcare service interoperability, ICT readiness of e-Health services, integration of cloud with sensor data, device to service oriented healthcare approach on cloud, technology for tele healthcare.

Availability of electronic health record system and clinical healthcare software in the leading hospitals in many of the developed and developing country clearly indicates the result of research and advancement in this area. Some of the hospital centric commercial services related to clinical side are being offered on web and mobile by the hospitals and diagnostics laboratories.

Considering the infant stage of ICT application in healthcare, increased cost of

healthcare services, aging population of developed country, healthcare domain will see a quantum jump in the use of technology in near future.

## Healthcare Visualization of Future

Future healthcare will have multi dimensional technology enabler to focus on patient health. The social, information, mobile and cloud enabler will help in better diagnosis and treatment of patient.

Now, people are talking about Digital and Paperless Hospital System where in they want to use smart devices, mobile and communication technology for improved healthcare response. The use of technology has improved the overall treatment process in terms of time and quality. The healthcare industry will continue to grow in importance around the world. New technologies, in particular, will play a key role in dramatically changing the practice of medicine and

- Device based technology.
- ICT application in healthcare.
- Storage and retrieval of information for healthcare.
- Decision System.
- Cloud & Remote health.
- Interoperability & standardisation.
- Wearable sensors in common usage.
- Robotics in healthcare.
- Intelligence & Analysis of Decision and Action.

Current Healthcare

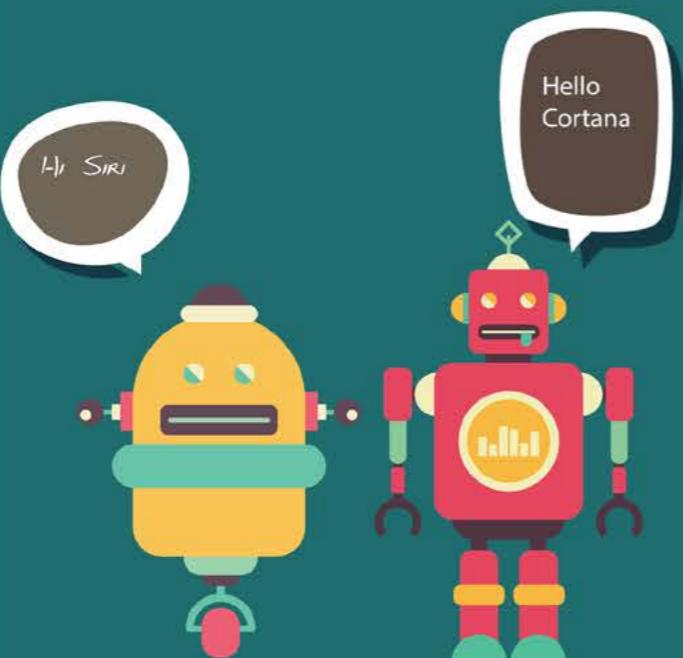
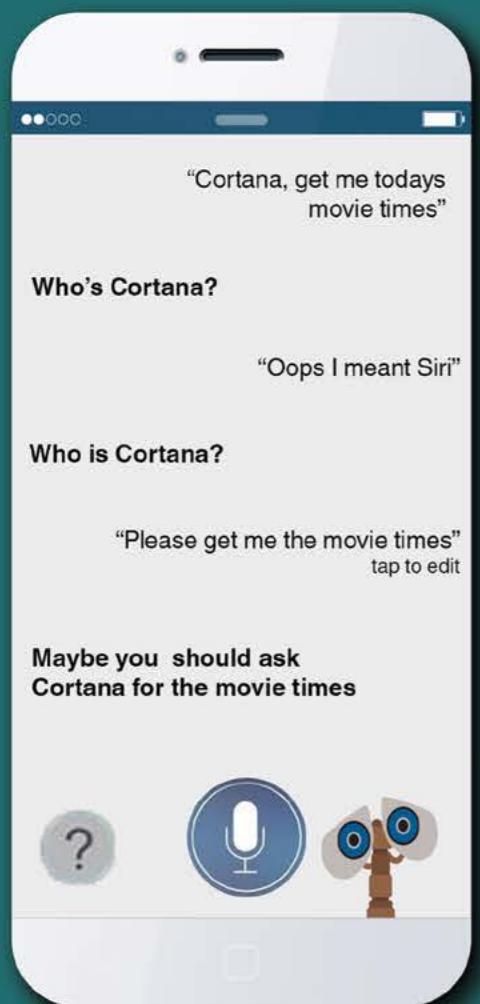
Technology in Progress

Future Healthcare

shape up in future.

Current usage of technology is limited to application of technology on healthcare devices, ICT application and storage and retrieval of healthcare data for hospital usage. Technologies such as cloud, remote monitoring, standardization of healthcare data and decision system are currently progressing and there are quite a few good solutions already available. In future, usages of robotics to simulate and perform surgery, more intelligent system to enrich doctors and clinicians to take decisions and common wearable devices will help the diagnostics and treatment in healthcare.

We can also think about the futuristic medical IT system model which may be realized in coming 20 years. Where the advance areas of medical system like robotics, genomic IT, predictive health system, wearable systems and current medical developed and upcoming solutions such as home health, patient IT solutions will become part of global health information exchange. Cross industry integration will help to enrich the interoperability of healthcare system for user and service providers. •



# THE ROAD LESS TAKEN

## computational linguistics

Kriti Singh | B.Tech 2017

**P**ersonal assistants like Siri, SVoice, Google Now & tools like Google Translate and other sentiment analysers are blurring the line between the human-machine interactions as the machines delve deeper to understand the human language intricacies, more intelligently than ever.

Natural languages precisely refer to the ones human beings use to communicate with each other. It is the language a cognitively normal human infant, whose development has been through use rather than by prescription, is able to learn. Computational linguistics (CL) is a discipline between linguistics and computer science which is concerned with the computational aspects of the natural language faculty. It belongs to the cognitive sciences and overlaps with the field of artificial intelligence (AI), a branch of computer science aiming at computational models of human cognition.

Computational linguists build systems that can perform tasks such as speech recognition (e.g., Siri), speech synthesis, machine translation (e.g., Google Translate), grammar checking, text mining etc.

Computational linguistics originated with efforts in the United States in the 1950s to use computers to automatically translate texts from foreign languages, particularly Russian scientific journals, into English. Efforts to translate between human languages requires understanding the grammar of both languages, including both morphology (the grammar of word forms) and syntax (the grammar of sentence structure). In order to understand syntax, one had to also understand the semantics and the lexicon (or 'vocabulary'), and even to understand something of the pragmatics of language use. This redirects to one of the most significant problems in processing natural language, ambiguity. For instance, in "I saw the man in the park with the telescope", it is unclear whether I, the man, or the park has the telescope. If you are told by a fire inspector, "There's a pile of inflammable trash next to your car. You are going to have to get rid of it", whether the word 'it' is interpreted as referring to the pile of trash or to the car will result in dramatic differences in the action taken. Ambiguities like these are pervasive in spoken utterances and written texts. Most ambiguities escape our notice because we are very good at resolving them using our knowledge of the world and of the context. But computer systems do not have much knowledge of the world and do not do a good job of making use of the context. This is where various Natural Language Processing (+NLP) researchers model algorithms to parse the human language expressions and extract anaphoric relations depending on the language lexicon. These algorithms further lay the foundation for building speech recognition and sentiment analysis engines.

Modelling mechanisms to comprehend natural language on a computer is done by implementing various algorithms proposed by the academia using tools like ScalaN-

LP, Snowball, OpenNLP, Stanford Parser etc., depending on their scripting language, which usually is one of C++, Python or Java.

In India, the institutes offer CL course either under the Department of Linguistics or under Department of Computer Science. Courses like Post M.A. Diploma in Linguistics/Advanced Diploma in Applied Linguistics, M.Phil. in Linguistics, M. S. in Computational Linguistics etc. prepare the student for R&D jobs and higher research in the field. Universities like University of Delhi (DU), Indian Institute of Information Technology, Hyderabad (IIIT-H), Jawaharlal Nehru University, Delhi (JNU) are a few of schools offering such specialisation courses in India. Abroad, almost all the major universities offer a minor and a major in cognitive science; University of Texas at Austin, University of Washington, University of California, Berkeley and University of South Florida to name a few notable ones.

With respect to industries, companies seeking NLP experts require the linguists to possess skills such as knowledge of foreign language(s), platform-relevant computer scripting/programming skills, speech recognition, prior experience in a similar implementation etc. Graduates or postgraduates with experience in NLP, data mining, working with text analytics and information retrieval, working with unstructured data are hired as Natural Language Processing Analysts. In the academia, understanding of language modeling, machine learning, phrase structure parsing serves as a starting platform to pursue research and model more accurate algorithms for NLP, preferably inclusive of some machine learning algorithm for the system to evolve with use.

In recent years, the demand for Computational Linguists has risen with the increase of language technology products in the Internet. Job offers come from developers improving Internet search engines with linguistic means, or facilitating the user interface with lingubots or integrating speech recognition with language processing techniques. There are strong open-source development projects as well. Companies like Microsoft, IBM, Google, Cycorp, Converse, LingSoft, Sony, Samsung and multiple research labs under Universities and Governments hire computational linguists for work in various aspects of speech technology - corpus development, language modeling, scripting and programming, phonetic transcription, grammar checking, and development of lexical resources. These companies may also hire linguists for localization of products for sale in other countries. The salary offered is as per the industry standards (15 - 16 LPA) for freshers. Applicants with Masters degree are eligible for positions of R&D and higher experience, as project leaders and managers. Though fairly young, this field is expanding fast, both in terms of research and prototyping. It has potential of being the-next-big-thing seamlessly integrated as a virtual companion and assistant in our lives in a few years to come. •

# DEPARTMENT HIGHLIGHTS

## HIGHER STUDIES



**AMAN BHAL**, B.Tech 2015, secured admission in Texas A&M University's Master of Science (M.S) in Computer Science programme.



**KAUSHIK NIMALLA**, B.Tech 2015, secured admission in Bowing Green State University's Master of Science (M.S) in Computer Science programme.



**ZHILMIL DHILLON**, B.Tech 2015, secured admission in Rutgers University's Master of Science (M.S) in Computer Science programme.



**RAHUL PAUL**, M.Tech 2015, joined University of South Florida's Ph.D. programme in Computer Science.

## SHORT TERM COURSES

The Department organized a short term course on "Network Protocols & their Simulation using NS-2/NS-3" during 19-23 August, 2015. This short term course was laboratory oriented where hands on training were given. Mr. R. Thirukumaran from SAT Infosys and Dr. Mohit P. Tahiliani from NIT Surathkal delivered lectures and conducted the hands on session. Dr. Chiranjeev Kumar was the course co-ordinator and Dr. Haider Banka was the course co-ordinator.



A short term course on "Wireless Network Protocols And Algorithms And Their Matlab Simulations" was organized by the department during 8-12th June, 2015. Dr. A. Tarachand was the coordinator and Dr. P. K. Jana was the co-coordinator of this course. The course was designed in order to be abreast with various protocols and algorithms in field of wireless sensor and ad hoc networks along with their simulations. Participants from IITs, NITs and other reputed institutions had attended this course.

A short term course on "Image Processing and its Applications" was organized by the department from 23-27th March, 2015. The objective of this course was to provide a broad overview and comprehensive understanding of image processing techniques using MATLAB. Each theoretical session was further demonstrated with hands on practical session in MATLAB environment. The intended participants were faculty members from Technical Institutions, PhD Research Scholars, PG and UG students. The workshop was organised by Dr. Sushila Maheshkar.

## UPCOMING INTERNATIONAL CONFERENCES

The Department is organising the 3rd IEEE Conference on "Recent Advances in Information Technology" from 3rd to 5th March, 2016. The vision of the conference is to provide awareness about the recent advances in the Information and Communication Technology, through tutorial, keynote addresses and peer-reviewed research paper presentations. The conference will also serve as an excellent platform for all the participants to share their views and ideas. Another endeavor of this conference is to collate and present the latest development in IT/Computer along with realistic assessment of the current status and trends. RAIT-2016 is endorsed by IEEE and IEEE Communication Society Calcutta Chapter. The previous RAIT conferences held in the years 2007, 2009, 2012 and 2014 were a grand success.

<<http://www.ismdhanbad.ac.in/depart/cse/rait2016>>

## NEW COURSES

The Department has started a 3 Year M.Tech course in Computer Science & Engineering for Working Executives/Academicians from 2015-2016 session. This programme runs at ISM Kolkata Extension Centre, Rajarhat, Kolkata.

## Ph.D. AWARDED

Sangram Ray, Pratyay Kuila, Neha Shardma, Chiranjeevi Manike, A. Tarachand, Suresh Dara, Dharavath Ramesh, Manoj Shukla

## DELEGATE VISITS

Dr. Thillainatarajan Sivakumaran, Executive Director of Global Initiatives, Mr. Rajev Sharma, M. D. TASA – South Asian Coordination Office and Dr. Gurcharan Singh, Advisor (International Education) from Arkansas State University, USA visited the department on 23rd March, 2015. The delegate visit resulted in signing of MoU with the Arkansas State University.



Mr. Ravi Srinivasan, Pro-Vice-Chancellor (Internationalization and Communications) from Botho University, Botswana visited the department on 25th February, 2015. The meeting resulted in signing of MoU with the Botho University.



## STUDENTS' ACHIEVEMENT

Manaar Alam, Himanshu Ranjan Seth, Soumyajit Chatterjee and Sagnik Das (Left to Right) from M.Tech Computer Science & Engineering implemented a "Carom Playing Bot" for participating in the International Championship for Artificial Intelligence and Networking 2015 (iCAIN). They secured 2nd position in Robotics Event.

## TECH TALKS

Prof. Rajib Bandyopadhyay from the Department of Instrumentation and Electronics Engineering of Jadavpur University, Kolkata delivered a guest lecture on "An Insight into an Electronic Nose and Electronic Tongue" on March 11th, 2015. The lecture was organised under the aegis of ACM ISM Student Chapter.



Dr. S. K. Singh from IIT (BHU), Varanasi delivered a lecture on "Biometric Based Applications" on 26th March, 2015.

Dr. Satish Chand from NSIT New Delhi delivered lectures "Some Aspects of Image Processing" and "JPEG Standards" on March 27th.

## INDUCTION

The Department organized an induction programme for new entrants of M.Tech & JRF on 22nd July, 2015 in New Lecture Hall Complex. For 3 year M.Tech students, the induction took place on 1st August, 2015 at Kolkata extension centre. For B.Tech students, it was held on 7th August, 2015 in NLHC.

## UPCOMING SHORT TERM COURSES

NAME OF THE COURSE	CO-ORDINATORS & CO-COORDINATORS	DURATION	VENUE
Fundamentals of Soft Computing & its Applications	Dr. Haider Banika Dr. Chiranjeev Kumar	09-13 Sept 2015	Dhanbad
Advanced Data Structures and its Applications	Dr. Sachin Tripathi	01-05 Oct 2015	Kolkata
Wireless LAN and Bluetooth Security	Dr. G. P. Biswas Dr. Hari Om Dr. Arup Kumar Pal	15-19 Dec 2015	Dhanbad
Information Storage & Retrieval	Dr. Dharavath Ramesh Dr. Sukomal Pal	04-08 Jan 2016	Kolkata
Image Processing: Algorithms and Applications	Dr. Arup Kumar Pal Dr. Soumen Bag	11-15 Jan 2016	Kolkata
Nature Inspired Computing for Search & Optimisations	Dr. Haider Banika Dr. Chiranjeev Kumar	08-12 Feb 2016	Kolkata

# JUDGEMENT DAY

Soham Satyadharma | B.Tech 2018

“ The development of full artificial intelligence could spell the end of the human race.

-Stephen Hawking



With artificial intelligence we are summoning the demon.

-Elon Musk

”



It's amazing that in an era in which it has been well nigh impossible to wash anything under the carpet, when nothing has remained a secret, when information is as ubiquitous as cowboys were in the Old West, a very insignificant looking incident with possible repercussions for the future was allowed to remain insignificant. In the last week of June this year, a 22 year old Volkswagen employee was killed by a robot. The man was setting up the stationary robot, which was programmed to do different production tasks, with another team member when it grabbed and crushed him against a metal plate. Maybe, it was just another of those accidents, but delving deeper into the incident, was it another warning towards a future that looks increasingly dystopian? With mankind leaning more and more towards automation every passing day and with artificial intelligence not being the distant dream it was in the past, who can guarantee that there will never be a Skynet in the real world? Who can save mankind if things as soulless and menacing as terminators descend on us with the single intention of wiping us off the planet we so dearly call our home?

Well, that was probably a hyperbolic statement, and even its greatest detractors will agree that artificial intelligence has unforeseen benefits, but we certainly can't afford to overlook impending doom. What if

thinking robots that can engage and eliminate a target without human intervention become the Kalashnikovs of tomorrow? While experts and scientists are always trying to limit the development of deadly AI, mankind has proved time and again that anything good always has a dark side. Unlike heavy duty nuclear bombs, these weapons require no rare or costly raw materials, and will be, hence easier to mass produce. This makes it extremely likely for them to end up in the black market, and then, terrorists, dictators (Was there ever a difference?) and others of their ilk are never far away, are they? With potential to be used as both weapons of mass destruction and for stealth missions, the future doesn't look too rosy, does it? And with small being perennially beautiful, what if the Ant Mans of the reel make the seemingly imminent transition into the real?

Stephen Hawking and Elon Musk themselves have warned that a global robotics arms race is inevitable, saying that starting a military AI arms race is a bad idea, and should be prevented by a ban on offensive autonomous weapons beyond meaningful human control. In light of these views, maybe Skynet level AI will not be such a giant leap for mankind as previously thought. And if judgement day ever happens, may the force be with us. •

# ADIEU

Shantanu Mishra | B.Tech 2017



There is surely something peculiar to farewells that any other occasions fail to imitate. It has the pain of separation, along with the splashes of all the gleeful memories of your college life. You anticipate the day eagerly throughout your college days, but the nearer it gets, you want the time to run slow and let you rejoice every moment. The entire world changes forever the morning that follows, as if you were a part of a long dream. You want to live the dream again, but it's all etched into your memories now, a whole new life being the new reality.

On the evening of 27th April, the CSE department was all part of this dream lived by our final years in undergraduate and postgraduate courses. It was a night when they danced under the stars, they sang in chorus, they laughed and they cried- undeterred by what tomorrow beholds for them.

It all started with the beats of dhol rocking every nook and corner of Sapphire Hostel as the third years left no stone unturned to make the farewell a grand one. The final years were dressed up in traditional Indian clothing as the procession marched the roads of ISM, dancing and matching their steps to the beats of the dhol. Soon enough, the procession reached the Golden Jubilee Lecture Theater (GJLT) after the final years from Ruby Hostel joined midway; awaiting them was a celebration of some sort as they entered a fully packed hall. Rishabh Mehta and Rashmi Sinha from B.Tech. second year and Rashmi Priya with Anamika Sood alongside from M.Tech. first year took the onus of anchorship. The formal proceedings commenced with Prof. P.K. Jana, one of the senior most faculty of the department addressing the gathering. As a professor to the batch on three separate occasions, Prof. Jana shared a deep bond with the ongoing batch, the fact which was evident from the emotions which ran through his speech.

The final years in GJLT were immersed in an ocean of nostalgia themselves as professors recalled their own experiences with the class of 2015. It was a pleasant day out for the students as well as the professors outside the confined atmosphere of the classroom as they shared moments they'll cherish throughout their life. Meanwhile the final years were called up on stage time and again to collect their mementos, a tiny reminder of the days they spent being a student of this institution. The

night soon turned into a musical saga with a melodious song by Ronak Baid of B.Tech second year. The office bearers of CSE Society, ACM ISM Dhanbad Chapter, members of Editorial Board and the Alumni Affairs' team were called in between to be handed over the certificates of appreciation for the all round development the Department has seen in recent past. The musical saga continued with a touch of class by Utsav Kumar and Harendra Khande who produced back to back flute performances as the audience immersed themselves in the sweet symphony.

The evening soon drifted towards its conclusion with CK Sir, as our Head of Department is lovingly called, taking upon the dais to address the final years for one last time in ISM. Finding it increasingly difficult to jot down all his emotions in the constraints of few pages of his speech, he remarked how proud he felt to have been a professor to the 2015 batch. He was insistent to not call the farewell as 'Alvida' but kind of a 'See You Again' as parting ways won't ever break the bonds that had been forged in the college, but only increase the time span between the next meeting. He also invited all those present in the GJLT to attend Confluence-2015, the reunion of department of CSE that took place in Delhi on June 13, 2015. The formal proceedings ended with deliverance of a vote of thanks by Ashay Sinha, Secretary, CSE Society to all those present in GJLT as everyone proceeded to dinner in GJLT Dome.

It's the time to say goodbye to our final years and letting us cope with their absence, except that, there is one fundamental flaw in saying a goodbye. The flaw of being so incomplete a word when you crave to convey all your emotions in the warmth of the moment. A goodbye may quench the need to have a parting dialogue, but when it comes to conveying the emotions flooding through the heart, it always leaves a big void behind. And when it's the season of farewells and there is all possible chance to never see the person again in life, goodbye is all but what you sincerely feel.

So here it comes from us -

*"Dear Seniors, wish you all the success in your life. Do spare some moments cherishing the bond we share. We hope our path crosses in some walk of our life."*

Bon Voyage! •

# IN CONVERSATION WITH



**PRAKHAR RASTOGI**  
B.Tech 2014

*He is the Gold Medallist of B.Tech Class of 2014, a Microsoft intern and was handpicked by Arista Networks during his campus placements. A man of sheer determination, Prakhar Rastogi, today is an inspiration for many of us. BufferedReader has always been instrumental in accentuating the experiences and achievements of the alumni of the department, to help enable the students to learn from them. On similar lines, our BufferedWriter, Ashay Sinha, met Prakhar in Bangalore. An excerpt from the conversation.*

Ashay: So Sir, tell us how has your life since ISM been?

Prakhar: To sum it all, I miss my college days. In college connecting with your friends was really easy considering the fact that they would normally be living in the room next to yours. But as you progress into your professional life, meeting up is not as easy as it was then. People have their own professional commitments due to which meeting up becomes a pretty difficult task. I feel that it's very difficult to organise meets after passing out from college.

Ashay: What do you think is the best advantage of working for a company like Arista Networks, which as of now has a limited number of employees?

Prakhar: According to me the best part of working in such a company is that it gives us a really good platform to interact with other fellow employees, and to really get to know one another. The problem with corporate culture, which exists in other firms, is that it deprives us of a chance to really get to know our colleagues.

Ashay: And a disadvantage of working in such a company would be?

Prakhar: I really believe that there really isn't any disadvantage in working for a company where there are a limited number of employees. There exists a general perception that in case of smaller companies, there is an increased workload, due to the limited amount of resources the company has at hand. However I think this is a misconception. Though the employees have to work really hard, this experience helps to teach you how to really handle work. If life was easy, you'd always want it to be easy. Consequently, you won't learn anything and you won't eventually grow as a person.

Ashay: Arista Networks is a domain specific company.

Your work mostly revolves around the repeated use of network structures. What are your views on this? Do you ever get bored as your work revolves around a single topic?

Prakhar: I believe that this would not be a problem if you're really like networking. Personally I feel that networking is a really interesting field with a lot of protocols that impacts larger audience as internet. Arista is relatively new so here you get a chance to work on protocols from the scratch. However if you were working in a larger company your contribution would be restricted. So working at Arista has been a really good learning experience so far. And I feel that if you're really passionate about what you are doing, there is absolutely no way you would ever get bored.

Ashay: 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?

Prakhar: Well I would say it really helped as I have reached here because of it. The only thing that is lacking in the existing system is the lack of practical exposure. Normally we cram up topics only for the sake of doing well in our exams. This attitude should change. In our college, everything is manual starting from student registration in first year, semester registration, queuing up in front of warden's office for room allotment and many more. This is an opportunity for students to hone their problem solving skills using coding. CK sir has taken the initiative by giving these projects as part of DBMS, but I would say they should be moved under cyber society and students should voluntarily take them up and maintain them from second year onwards. It's nice to hear that seniors are now conducting workshops to help the juniors hone their skills, so I would suggest that the juniors should really make use of these opportunities.

Ashay: It's pretty common for Indian IT employees to lose interest in their work and pursue other avenues like an MBA, IAS, etc. What are your views on the subject?

Prakhar: After coming into the industry people themselves introspect on whether or not they want to continue with their current career path. The IT industry is such where you can only work to your fullest potential if you're truly passionate about computer science. These days it has become a common trend to pursue this course as people normally see the pay packages that this industry offers. However if you are truly not devoted to this field you will face problems in the future.

Ashay: Do you really have to be good at coding to enter the IT Industry?

Prakhar: Being good at coding is a vital skill to possess. However I do not believe it is the only skill that will help you succeed. In addition to it try to learn new technologies and use them to provide real time solution of any problem. Coding skills can be honed and developed with time.

Ashay: Are the programming languages that you learned in college being used in your professional life?

Prakhar: Yes, you can never run away from C and C++. Well I believe that learning algorithms and the logic behind simple operations is more important than knowing different languages. Though the syntax may change from language to language but the primary logic behind most operations remains the same.

Ashay: So to seek a career in networking do you need to have pre-existing knowledge about the subject?

Prakhar: Well I would say computer networks basics are must. When I was recruited by Arista, even during the interview I wasn't asked questions from networking though the job profile for that particular role was pertaining to networking. After joining Arista there were a series of workshops and boot camps that helped me to ramp up for the job profile.

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

Prakhar: I wish I had coded more. That is one area I feel I could have done better. I would advise all the juniors to stick to the college curriculum and be thorough with the knowledge imparted and be clear conceptually. This is vital.

Ashay: Can you tell you about your internship at Microsoft?

Prakhar: Well that is a very good question. I think I got really lucky when I managed to land this internship. I spent only 7 days studying GeeksforGeeks, trying to learn up as much as I could. Thankfully, despite my lack of preparation I managed to get the internship opportunity, but sadly I was unable to get a PPO. However I really enjoyed my time there. The working environment and the culture was excellent.

Ashay: How would you compare the experience of working at Microsoft while interning to that of working as a full time hire at Arista now?

Prakhar: Well in Microsoft you are provided with a lot of facilities like a large cafeteria, a gym, etc. that are currently not provided by Arista. However while working at Arista, I got the opportunity to learn the basics of Linux and various other skills that I would not have had the chance to develop had I worked in a well-established company such as Microsoft. This is because in large companies you have a separate teams like infra, it-support, dev, test etc. to deal with different types of problems.. However in case of smaller companies, most of the employees have to sort out the basic issues that may arise while working, and hence this helps to build your knowledge of various topics. In Arista you are not forced to work in teams, and you can often tackle issues on your own. To encourage this culture, Arista has introduced a system of peer-bonuses that help motivate the employees to tackle major issues on their own.

Ashay: What do you think is one of the "must dos" at ISM?

Prakhar: Its pretty simple, just enjoy these four years while they last.

Ashay: What do you think you as an Alumnus can do to help the college now?

Prakhar: Well as alumni I believe it is our duty to help our juniors by imparting knowledge and by providing financial support. The rate at which department is improving, I envision a really good future!

Compiled by:  
Ashay Sinha | B.Tech 2016  
Pranav Thombre | Dual 2019

Georgia Institute of Technology researchers have developed a computing system that views video game play on streaming services, analyzes the footage, and then creates original new sections of a game. The system focuses on the gaming terrain and the positioning between elements on-screen, and determines the required relationship or level design rule. The algorithms identify high-interaction areas, and the automatic-level designer targets these areas to gain design information, enabling the system to build a new level section, element by element.



My precioussss

bing search results

impression  
NOUN

1. an idea, feeling, or opinion about something

do an impression

X



Stanford University researchers have developed a synchronous computer that operates using the physics of moving water droplets with the goal to build a completely new class of computers that can precisely control and manipulate physical matter. Every water droplet moves exactly one step forward with each cycle with its presence and absence representing the 1s and 0s of binary code, and the clock makes sure all the droplets move in synchrony, allowing the system to run virtually forever without any errors.



Experts are trying to make machines to be moral. This would involve having the robot use a form of machine learning to "learn" moral behavior, possibly by observing human media. Moral issues will also start to crop up around how people perceive machines as they become more and more human-like.



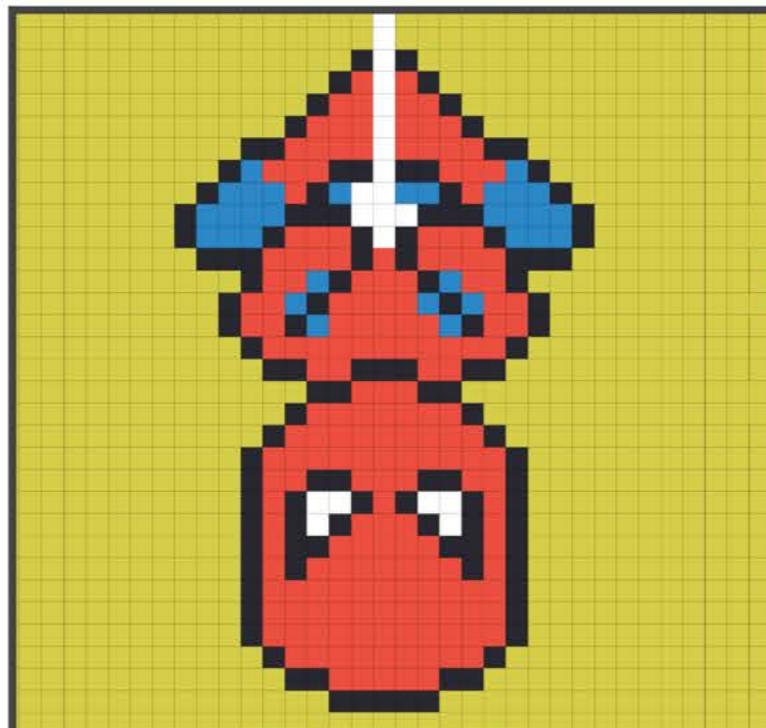
New software can bring a sense of humor to online chat. Called CAHOOTS, the system suggests humorous pictures to use when chatting online. The system is designed to use text typed into a chat window to search for images and constantly provide an updated selection from which to choose. The developer team tested CAHOOTS on more than 700 recruits from Amazon's Mechanical Turk crowdsourced working platform, and found most thought using the system was more fun than plain chat and that it helped them express their sense of humor.

# MILESTONES

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Amrita Kumari | B.Tech 2017  
Ayush Khandelwal | B.Tech 2018

Imperial College of London researchers have developed software that can improve the reliability of pictures taken by a microscope camera by determining the exact properties of each individual pixel, based on a statistical analysis of thousands of images, and then adjusting the data captured by each pixel accordingly. This technique improves the fine details of the whole picture, making it much more reliable.



WebAssembly is a joint project among Microsoft, Google, Mozilla, and Apple to create a new internet platform that combines the reach of the Web with the speed of software written to run natively on specific operating systems. WebAssembly, which is the result of the unification of Mozilla's Firefox team and Google's Chrome team, could result in the ability to browse the Web much faster, as well as providing a smoother experience when loading Web apps.



Facebook has developed an experimental algorithm that recognizes people in photographs even when their faces are hidden. A face-recognition algorithm has been adapted to look for unique characteristics such as clothing, hairstyle, body shape, and pose, which is what humans do very well, according to Facebook's Yann LeCun. The algorithm recognized individual people's identities with 83-percent accuracy.





**A**pple's annual Worldwide Developers Conference was held from June 8 to 12, 2015 in Moscone West in San Francisco. The conference was used by Apple to showcase its new software and technologies for software developers. Attendees participated in hands-on labs with Apple engineers, as well as in-depth sessions that covered a wide variety of topics.

Whereas Google I/O, an annual software developer-focused conference was held by Google in San Francisco, California from May 28 to 29, 2015. Google I/O features highly technical, in-depth sessions focused on building web, mobile, and enterprise applications technologies. Google I/O brings together the world's best Android developers and showcases the very best of what comes next for Android.

Apple WWDC was full of innovations and promises. Tim Cook delivered, promising to "change the way that you experience music forever" with a new streaming platform—Apple Music. The service includes "radio" stations curated by artists, including a 24-hour station called Beats 1 hosted by DJ Zane Lowe. Apple also complied with newest version of OS X called El Capitan, which includes improvements like better search across different programs and better tabs within Safari and email. Apple announced iOS 9, which can search email to try to identify who's calling. That's nice since Apple doesn't allow the many, many caller ID apps to work the way they do on Android.

Also Apple's iPad now gets true multitasking, including picture-in-picture video, more seamless app switching



and expanded use of Notes, which toggles into other apps while staying open. Apple also introduced a new content discovery app called News which serves as a personalized feed just for you. Apple Maps gets an improvement with Transit, which shows mass transit directions, launches in 30 U.S. cities, including New York, and in 300 cities in China.

Well talking of innovations Google is right up there and the Google I/O conference was a testimony. Google introduced Android M, which is the most powerful Android release to date, and is now available to download as a developer preview. New contactless payment system Android Pay will act as a replacement for Google Wallet and direct rival to Apple Pay. Google opened a new project called Project Brillo, a new Android-derived platform that helps developers build connected devices to work across the Internet of Things, using communications protocol Weave and aims to unite all connected devices to work seamlessly with each other and your smartphone.

New app called Google Photos was introduced which will back up your pictures into a timeline, and will offer unlimited storage for free, a handy when Google estimates we're likely to take one trillion photos this year alone. Android Wear, Google's operating system for its wearables, also received a number of upgrades. Users will be able to flick their wrists to skip pages or see their next text message, for example, and draw pictures to send to friends. The latest addition to Google's raft of offline services, Offline Maps which will allow users to search for locations and receive turn-by-turn directions without the need for an internet connection, and even read reviews on nearby restaurants and landmarks.



## ALUMNI PEN

Siba Mishra | Research Scholar



**Dr. Pratyay Kuila**

*Dr. Kuila was a Research Scholar in the Department of Computer Science and Engineering. Pratyay completed his research work in the year 2014 and currently serves as a faculty in KIIT University, Bhubaneswar.*

**Q** What life-lessons did you learn during your tenure at ISM?

I learned to be realistic, be optimistic and to how to enjoy it. The journey pushed me far beyond my mental limits and then I emerged stronger as a result. These few years have made me wiser, savvier, grittier, focused, creative, expressive, perceptive, more steely and professionally effective than I was as a fresh post-graduate.

**Q** What advice would you give to the students currently pursuing research in ISM?

Since everyone's Ph.D experience differs greatly and lessons are learnt from different sources, I believe I should not provide any unsolicited advice to the researchers. However, only to early stage researchers: Choose your coffee mug, Secure your desk and Learn to enjoy your work. Believe me, the coming days are going to be pretty nice for you.

**Q** Apart from research, PhD students engage themselves in teaching and assisting in labs. What is your take on that?

Yes, beside my research works, I was engaged in some classes and laboratories for undergraduate and post-graduate students. It was a great opportunity for me to be a part of teaching-learning process in ISM.

**Q** Did you enjoy your time as a researcher in ISM?

Yes, the whole tenure was full of fun. All snacks times in college-canteen was fun, late night birthday celebrations in hostel, weekend movies, Srijan, Basant, everything was fun. But the most enjoyable stuff was coming up with new ideas in your mind, successful experiments, writing programs (as we are code-blooded), editing papers and getting acceptance report of it, when the fun turns into fulfilment.

# INTERNS' EXPERIENCE

Maheshwara Reddy Chennuru| Dual 2018



After clearing the technical round with Bentley Systems I was informed that there will be an HR round so I was eager and simultaneously apprehensive about it. After a few questions in the HR round I was certain that I was going to grab the internship. This made me confident and happy. I was sure that my internship would be altogether a great experience for me and it indeed was. I worked on two main projects. I was asked to build a website as a part of my first project for a new product that the Bentley Systems were coming up with, named as "Traffic Manager of India". The entire project was built in C# with MVC framework. My second project was a research project based on Semantic Web. Where usage of ontology classes was crucial. Inside semantic web I used Hermit API to infer the given ontology. My other project was to convert XML

 **Bentley**  
Sustaining Infrastructure

I miss playing table tennis with my colleagues. Pune is a fun filled city. My office was located at Magarpatta City also known as the Cyber City of Pune. The entire campus was huge and you could roam around freely at whatever time you wanted to. We explored lot of places in Pune and team outings were paramount. My advice for juniors is that be it small or big, start working on projects and ideas that you find interesting.

schema which was specifically designed for the organisation into Ontology classes. These are present developing technological advancements and I loved working with them. Other than these I would like to take a shot at data mining and machine learning which are picking up noticeable quality nowadays. Coming to my favourite part of the office I loved the cafeteria. Discussions with my team during lunch breaks was a real fun and



The day I heard that I was selected for an internship at Amazon, I felt upbeat that all my diligent work, which included enhancing my coding abilities persistently and in addition doing admirably in studies, has finally paid off. My real venture in Amazon included dealing with site which was built on Ruby on Rails. As you probably are aware Amazon contains critical information which is downloadable for internal purposes. My task is to review all the operations that were being performed on the arranged data in order to keep anybody from hampering and illicit utilization. My second project included debugging a form implementation. Even though using internal tools of Amazon was bit hard yet I figured out and completed my task. Something else I am



After receiving my internship offer from Microsoft, I was having blended kind of emotions, I was both anxious and amped up for the work. I was determined that whatever is the work, I ought to have the capacity to impress my manager and land with a full time offer. Getting a PPO from Microsoft was my primary target. I primarily worked on Android App for Word. My project was to make a tool to centralise the tasks that included internal maintenance and advancement of the app. This tool would allow any member of the team to perform any specific tests on the pool of android devices available and get the report log. As the first component of my project, I made an android application that sends to the central server, device parameters like the IP address, battery level, availability, etc. which are required to run the tests. The second component is clearly a server, so I wrote the server code that received the data from the devices and stored it in a database. The last component was user-request tool.

Building every component from scratch and seeing them work is a noteworthy achievement for me. I knew that it was a big project and even my mentor was not certain that I would be able to finish it before the end of my internship. I am proud that I was able to complete my project in 40 days and even did some extra things in those 25 days. I am more than glad about the work in Word App group, however I am interested in the Operating System of Microsoft - Windows. In my opinion interning at a

startup that has a decent work culture and which is growing exponentially is the best thing to do, in light of the fact that you get the chance to take a shot at various technologies, products, APIs and frameworks. My advice to juniors would be that Data Structures and Algorithms are exceptionally essential things and one must be solid in those areas. Furthermore, you ought to have the capacity to implement things that you are taught. Mugging up GeeksforGeeks is not sufficient.



I was extremely happy and enthusiastic to know the work culture and general life at Arista Networks. As is already known, switches used in data centers have OS that manages all the packets coming to it and forwards them from one port to another. On top of it there might be many processes which have large process address space. All these processes have some memory space that is redundant among them.

My project was to design a data structure to share a given memory region in the physical memory and map it to the virtual address space of the processes that were expected to share it. My undertaking was a touch of battle both for me and my mentor as it was not related to the past work and I am proud that my code is actually going to be live soon and will be shipped to its significant clients. My mentor was truly awesome; he mentored me in an astounding way. He comprehended my level with OS, began with the very nuts and bolts and took me to the finish line in a perfect manner, and most importantly, he would solve all my doubts patiently. Other than my cur-





**Ayush  
Agrawal**

**CouponDunia**

**F**rankly speaking, after my internship offer I was a bit intimidated about the project I would be assigned considering that I am not much into competitive coding. I was assigned a real time project which will mostly be implemented in the upcoming devices of Samsung based on Tizen. Following up on that, my task was to design and implement a mechanism for real-time authentication of devices, be it Smartphone, Smart TV, Galaxy Gear or Smart Refrigerators (maybe in future).



The project was based on the concept popularly known as "Internet of Things". Coming to my manager he was really skilled and a very dedicated person. I got to learn a lot from him, not just technical stuff, but also managerial and corporate stuff. One thing that I am most proud of, regarding the internship, would be working days and nights trying to make something totally new for the world and then convert-

ing the idea into code while facing all the challenges to port the code to real devices. Seeing what you worked on for two months finally run on devices is absolutely stupendous. Considering my experience as an intern both in a big company and a startup i would say that you get to learn most depending upon how you take up the task assigned to you. However, I must admit, in a big company, it also depends upon your luck whether you get to debug a code or work on a live project. The city of Bangalore is one of the nicest cities I have

been to. Totally loved the weather. Also, visiting some of the technological and entrepreneurial events compelled me to conclude its superiority in comparison to other cities in terms of innovation and a zeal of putting ideas into action. Some of the technologies I got to work with included Tizen, Open-id Connect, Facebook Connect, Google Security Authentication (OAuth) amongst many more.



**Mohit  
Chawla**

**I** was overwhelmed the day I got the confirmation call, I felt that all my hard work and perseverance had finally paid off! But I also realized that it wouldn't be easy and I will have to live up to the standards and expectations of the company, which for sure, wasn't easy. During the internship I mainly worked on two projects. One of them was post-sales module which is used to verify the coupon validity and other informations periodically for every client. The other was the newsletter generation module developed on PHP/ MySQL based portal which automatically generates newsletter based on user preferences. I am proud that I was able to complete it since newsletters is an important part of CouponDunia's marketing and promotion strategy. The best part of my work at CouponDunia was my team. In-spite of being an intern, I was assigned some important projects which was surprising at first. But the level and quality of guidance provided by my teammates and manager was sufficient to ensure that my work was up to the mark.

Besides this, being in a team of young individuals, i spent a lot of time together outside of work. Partying with them on the weekends was fun too. The city I lived in Mumbai was amazing and is known for it's rains - especially during early monsoon. While my friends in Delhi & Bangalore would call me up to ensure I didn't get flooded, it was rather "normal" for Mumbaikars. In-spite of this, Mumbai is a refreshing experience with a lively night life, star studded Bandra/Andheri walks and Juhu-Chaupati's Pav Bhaji! My sincere advice for juniors is that they should enjoy coding. Coding can be really interesting because it isn't just about data structures and algorithms. There's a whole lot of possibilities depending on one's interests. If you want to learn Data Science, start off with a simple Twitter Sentiment Analysis program in Python. If you want to develop Android apps, work on basic examples on Android Studio. Nothing can make coding more engaging than such real world projects!

## IN CONVERSATION WITH



**Pooja Chopra**  
*M.Tech. Class of 2011*

**Lokendra:** *Let's take you down the memory lane first, how was your life at ISM?*

**Pooja:** ISM was a life changer. It was so much fun and lot of great memories. Ours was a very nice batch. My batch-mates were great. The parties at '17 Degrees' not to forget were astonishing. Basant and Srijan were awesome. Placement time was the very important phase and parties which we had after that were mind blowing, our seniors were very motivating and helpful and teachers were also great. Almost all of us had two jobs. Almost every moment we have cherished!

**Sudha:** *Any special story you would like to share with us?*

*Be it 5 years back or 50 years, memories of college-time always gives nostalgia if you have enjoyed it. With this feeling Ms. Pooja Chopra of M.Tech Class of 2011, an employee of Oracle-Bangalore who also worked for Samsung R&D had a great conversation with two of the Buffered-Writers Lokendra and Sudha Shanker. Here is an extract from the conversation.*

**Sudha:** *Was everyone in your batch that much full of life or was it the confidence, that you guys enjoyed hard even at the time of placements?*

**Pooja:** Everyone was actually good at academics in our batch. And everyone was placed so yes they were confident enough.

**Sudha:** *Do Samsung and Oracle share same kind of work-culture or they are different?*

**Pooja:** Coming to Samsung first it provides you with nice pay and perks like free itineraries, good bonus, free food-cabs and all, but has tight working hours. On the other side Oracle gives you good initial hike but what I liked the most is the work-culture there. No one will bind you, one can even work from home, only thing is that you have to do your assigned work timely and no one will bother you.

**Lokendra:** *How good is the decision for a well-established person like you, to go for Ph.D?*

**Pooja:** In case of higher studies no one can guide you better than you, because you only know your priorities and responsibilities the most. It depends, how you see yourself after 10-15 years. You have to decide what are your likes and dislikes, and which field you find more suitable for yourself - corporate, research or management.

If I would think for myself, I would rather go for Executive MBA.

**Sudha:** *[Smiles] So you see yourself getting things done instead of doing them?*

**Pooja:** *[Laughs]* Yes, but everything has many aspects. There you need to take charge of supervision, allocation of right work to right people and getting things done at time.

**Lokendra:** *There have been always a tit-tat-tattle about relaxation, security etc. in academics over corporate, what you think about it after talking with your friends?*

**Pooja:** Every profession has its pros and cons. Teaching or company it depends on personal choice and motivation. Teaching is not easy as it seems, you have to handle so many things like academics and administration, dealing with students of all kinds and you have to be updated. In corporate you have tough competition; you have to work hard to keep good ratings, be updated with current technology and what your project needs. Working till late in the night at times.

**Sudha:** *What would you like to say to the current students of the department?*

**Pooja:** Keep learning and remain updated with what is actually going around. Live your life to the fullest and leave all your worries. Either you go for higher studies, corporate world or, in academics be a dedicated and smart worker. Do select the career you wish to pursue and rise in it. Just believe in yourself and you will reach where you want to. Stay focused and be confident. It was great talking to you people, helped me refresh the wonderful memories of ISM.

**Compiled by:**  
Sudha Shanker | M.Tech 2016  
Lokendra Saini | M.Tech 2016



# STUDENT ACTIVITIES

Kriti Singh, Parichaya Walia | B.Tech 2017



## Painting Competition on Cyber Crime

Mr. Deepak Kumar of the Cyber Crimes Cell at Delhi Police, took an initiative to organise a painting competition in collaboration with Reliance and Dell. It was held on March 22, 2015 under the CSES banner, at the ED hall, Department of Mechanical Engineering for participants across branches. The paints and brushes were provided at the spot. The participants sketched and painted their exposition of Cyber Crimes in the current lifestyle from 1 pm to 4 pm.

## Coding Competition : Code Rush 2.0

Coding and problem solving constitute the core of the Computer Science and Engineering industry. Keeping this in mind, the CSE Society organised the second edition of CodeRush on August 14th, 2015. CodeRush 2.0 was jointly organised by Rajesh Kumar Sinha, Raj Jha and Ashish Kumar from B.Tech Pre-Final Year. The students were divided into three divisions: Division 1 for B.Tech Final Year, B.Tech Pre-Final Year, M.Tech and Research Scholars, Division 2 for B.Tech 2nd Year and Division 3 for B.Tech 1st Year. A total of 225 students participated across all divisions in which Vamsi Krishna, Dev Kothari and Harmandeep Singh Kahlon emerged as winners. The winners were felicitated with a prize money of INR 2000.

## ACM Online Coding Competition

The ACM ISM Student Chapter conducted an online coding competition named GOOGOL 2015 on the 5th of April. It was a 3 hour coding competition that was conducted at the national level. The contestants were judged on the number of problems they were able to solve within the given period of time. In case of a tie, the time taken by the candidates was taken into consideration. The winners managed to win prizes to the tune of INR 10000.

### Winners :

1st	Pulkit Goel	IIT Hyderabad
2nd	A. Sunder	IIT Madras
3rd	Nishant Raj	ISM Dhanbad

## Powerpuff Coder's Coding Competition

The ACM ISM Student Chapter conducted an online coding competition exclusively for girls with the motivation to encourage equal participation of women in our society. The competition was conducted on the 26th April at 9pm. The participants were ranked as per the standard ACM-ICPC online round rules. The winners from the various years were :

Year	Name
1st	Harshita Mrityunjay
2nd	Uthsa Banerjee
3rd	Sheena Chhabra
4th & PG	Nishtha Gupta



## Android Fundamentals Workshop

The ACM ISM Student Chapter in association with the Android Club of ISM and Google Student Club organised a workshop that mainly concentrated on the fundamentals of android app development. This workshop was held in the form of seven sessions where interested students got to learn from Google resources. This workshop had been conducted over the months of February and March by Anish Sonani from B.Tech (2015).

## Workshop on Introduction to GIT

ACM also conducted a workshop on the introduction to GIT on the 1st of February at the Golden Jubilee Lecture Theatre. The workshop mainly revolved about GIT and its importance in open source programming. The participating students were also briefed about Google's Summer of Code Programme. The workshop was conducted by Mohit Punjabi from B.Tech (2015). •



Sketch by: Bidangshree Brahma | M.Tech 2016



## रंगमंच

हर इंसान की तरह  
मैं भी रंगकर्मी हूँ  
जीवन के रंगमंच का,  
मेरा वास्ता है हर रंग से  
चाहे जीवन का हो या प्रकृति का,  
विश्वास का हो या प्रेम का,  
इस बहुरंगी दुनिया में  
मेरा वास्ता है हर उस रंग से  
जो बनाता है जीवन को जीवन  
और दुनिया को एक बेहतर दुनिया,  
जिस रंग में निरंतर संघर्ष है  
स्थान-निर्मल का  
ठहराव-गति का  
संकीर्णता का - फैलाव का  
मैं वहाँ -  
निर्मल, गति, फैलाव के साथ हूँ ।

धर्मेन्द्र कुमार | M.Tech 2017



## Anticipating Eyes

Oh, those anticipating eyes  
That follow you as you pass the hostel gate  
Wrapped they are in a gleam of hope  
As they look in you their gift of fate.

Oh, those anticipating eyes  
That make the lethargic puller agile  
He gestures you to get seated behind him  
Expecting you to travel with him a mile.

Don't look at those anticipating eyes  
They fill you with mercy & make you weak  
And sometimes with a more pathetic visage  
Your heart ascends to pity's peak.

Or look at those anticipating eyes  
And let your humanistic conscience rise  
Accept his gesture, help him feed his juvenile  
And then encounter his beautiful, contentful smile.

Yash Goel | B.Tech 2018

	Dr. Sukomal Pal <i>BufferedAdmin</i>		Ms. Shweta Malwe <i>BufferedAdmin</i>		Bidangshree Brahma <i>BufferedDesigner</i>		Ashay Sinha <i>BufferedWriter</i>
	Aashish Kumar <i>BufferedDesigner</i>		Raushan Roy <i>BufferedDesigner</i>		Prabodh Tripathi <i>BufferedDesigner</i>		Yash Goel <i>BufferedDesigner</i>
	Kriti Singh <i>BufferedWriter</i>		Shantanu Mishra <i>Buffered Writer</i>		Parichaya Walia <i>BufferedWriter</i>		Maheshwara Reddy <i>BufferedWriter</i>
	Anupam Singh <i>BufferedWriter</i>		Amrita Kumari <i>BufferedWriter</i>		Pranav Thombre <i>BufferedWriter</i>		Vassudev Narayanan <i>BufferedWriter</i>
	Ashish Verma <i>BufferedWriter</i>		Ayush Khandelwal <i>BufferedWriter</i>		Sudha Shanker <i>BufferedWriter</i>		Lokendra Saini <i>BufferedWriter</i>
	Akshat Goyal <i>BufferedPhotographer</i>						

## CONTACT US

[www.bufferedreader.org](http://www.bufferedreader.org)  
[bufferedreader@ismdhanbad.ac.in](mailto:bufferedreader@ismdhanbad.ac.in)



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BIDANGSHREE BRAHMA  
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