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**BUILDING THE FUTURE**



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# WORDS OF ENCOURAGEMENT



DR. RAMA  
ACTING PRINCIPAL

Hans Raj College stands strong as a symbol of knowledge, learning and growth. The institution has been known to provide a placid environment and credible knowledge to its students since time immemorial. An unsullied pillar of learning in the field of Arts, Science and Commerce, this college is proud of all its departments and students.

The Computer Science Department of our college, with their persistent motive of spreading technical awareness in the college and outside, is back with its second edition of Bitwise. The idea behind this magazine is to engross the readers while leading them into the world of advancements. In a world where no one can afford to be technologically impaired, these pages with words carved on them will come as a great help.

I wish all the students luck and hope they achieve what they aim!



DR. BALJEET KAUR  
HEAD OF DEPARTMENT

“Success comes to those who work hard and stays with those, who don't rest on the laurels of the past.”

We live today in a world that is so very different from the one we grew up in. The world today is changing at a very high accelerated rate and the driving engine for this change is technology. We, the Department of Computer Science of Hansraj College, contribute to this change in our ways.

We have a dynamic and diversified pool of students who put their heart and soul in every activity they participate, be it academics, various competitions, workshops, or seminars. Their hard work has yielded the fruits of success in every field. Students have participated and won in international and national events like robotics competition, coding, shooting, archery, debating etc. They have also published research papers under the guidance of teachers. Some of the students have interned at hallowed organisations like DRDO, NIC etc.

With this vast chest of intellectuals, we have come up with 'Bitwise' that helps in spreading knowledge and awareness. Each issue of our magazine is a milestone that marks growth, advancements and innovations in the field of technology. A collaborative effort of committed and dedicated set of students with the editorial team has helped in creating this sensation and I hope that it successfully serves its purpose.

OFFICE BEARERS  
2016-17

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**JOINT SECRETARY**

Nayonika Barua

# ANNUAL REPORT 2016-17



DR. HARMEET KAUR  
CONVENOR

## COMPUTER SCIENCE SOCIETY, HANSRAJ COLLEGE

A plethora of events was successfully organized by the dedicated team of members and volunteers of Ordinateur.

Android is the latest buzzword in the field of Computer Science and to keep abreast with the fast moving technology, Android Workshop was organized in collaboration with Google where the students were rigorously trained to acquire professional acumen. CodeFlicks'16 – Intra Department Coding Competition was organized with the aim of encouraging the coding streak amongst the students. Students participated in a team of two or individually. The competition was organised in 2 rounds - the prelims and the finals. The prelims round required the participants to qualify a written test that had questions of aptitude and C/C++. The finals were conducted online on CodeChef.

To enlighten the students about the various career opportunities, a session on “Careers in IT after graduation” was organised in collaboration with Landmark Institute. Dr. Ritukar Chadha (Mathematics), Director of the institute was the speaker of the day.

Intra-Department Football Tournament was organised to encourage the spirit of sports among society members on October 22, 2016. All the matches had a length of 40 minutes. Team of sophomores won the tournament.

A workshop in collaboration with the departments of Sanskrit and the Computer Science was held to give hands on experience to the participants for typing documents in Word using the font Chankaya Walkman.

A hands on workshop on office tools for the non-teaching staff of college was successfully completed from 13th -16th December. A web designing workshop was held on 7th January, 2017.

The department is forever engaged in learning and imparting knowledge.



## LETTER *from* THE EDITOR

Technology, what comes to your mind when you hear this word? Umm robots, computers or maybe gadgets like anywhere door from “22nd century”. So what do you think technology is? Let's look at this my way. Last night I was at supermarket. I looked at a bottle. I imagined how they came up with the idea of bottle. It was nothing but plastic, somebody gave it a shape, some other person came up with the idea of the lid, and someone else gave it colors and so on. That was just one bottle. And then it struck me I was at a museum of human work. We humans work and work all our lives and come up with new things that make impossible possible. This is technology. It's something that makes you believe nothing is unachievable, something that turns dreams to reality, something that gives life to imagination, yup something amazing. Technology interests every person in one way or the other. That's what aim of BITWISE is. It's not just pretty pages with pretty pictures. It's a way of collecting all the technological advancements and presenting it in an understandable format. Basically it's a ride that will take you across all the work that we humans are doing for comforting the life of generations to come. Who won't be interested in that? I am keeping it short so that all you “geeks” can lose yourself in an amazing world of technology. Have a fun ride!

*Bhawna Dagar*  
Editor in Chief

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**Ordinateur**

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# ACHIEVEMENTS ( ACADEMICS )

## Innovation Project Scheme 2016-17

10 students of the Computer Science Department, Hansraj College were involved in two different projects under the guidance of the faculty members. One of the projects, DUA (Device for Uniquely Abled) aimed at creating a device for visually impaired students in helping them commute from one place to another, while the other project was based on the cryptographic techniques.

Members: *Manasi Aggarwal, Vishal Pandey, Prateek Moon, Shubham Kumar, Shaurya Sahai, Ginnisha Karira, Avinash Prasad, Abhishek Gupta, Sushmita Yadav, Satyam Santosh*

The former project also won the Best Poster Award in the Convocation Ceremony for the project.

## Placements 2016-17

8 students from third year were placed in Deloitte US as Associate Business Technology Analysts.

Students : *Abhishek Gupta, Avinash Prasad, Bhawna Dagar, Mridula Garg, Sakshi Yadav, Satyam Santosh, Sushmita Yadav, Swati Bajpai*

2 B.Tech final year students were placed in D.E. Shaw India Pvt. Ltd. as Technology Associates.

Students : *Piyush Panwar and Prateek Saigal*

*Shaurya Sahai* (B.Tech final year) was placed as Senior Content Writer in NIIT.

## Internships

*Shobhit Aggarwal* interned as Web Developer working on HTML, CSS, JavaScript and PHP for EFD. He was also a Summer Intern at Magis, working on HTML, CSS, JavaScript, PHP, JQuery, Bootstrap and MySQL. Currently, he also holds the position of the Technical Director for the same.

*Nidhi Jadeja* interned at DRDO working on Cryptanalysis of Lightweight Ciphers.

*Ashita Diwan* interned at National Informatics Center working on Image Segmentation using Remote Sensing and GIS Software Library.

*Paras Jain* interned at WireOut Technologies (Sharda Group) as Profile Designer for the 9ightout app.

*Paras Jain, Abhishek Gupta and Abhishek Rajput* interned at ShortsNow as Content Writers.

*Saurabh Sharma and Shivam Gangwar* interned at Infini Carriers as Graphic Designers.

*Vipin Kumar* designed the website for an author, Ajay K Paney.

*Shoaib Rayeen* interned in the Marketing team of DU Express and Cashji.

## Competitions

*Shobhit Aggarwal* won the coding competitions at Maitreyi College & Keshav Mahavidyalaya and bagged second position at St. Stephen's College & Deen Dayal Upadhyaya College.

*Piyush Panwar* won the SpecWars Competition at Keshav Mahavidyalaya. He is also the Campus Facilitator for Google's CS with Android Program.

*Purnima Yadav and Vishal Pandey* won the Web Designing Competitions held at Maitreyi College and Rajdhani College.

*Shaurya Sahai, Ginnisha Karira, Purnima Yadav and Piyush Panwar* participated in ACM-ICPC.

*Medha Gulati, Anmol Goel, Avishi Goyal and Prince Mittal* participated in the e-Yantra Robotics Competition conducted by IIT-B. *Saumya Tanwar, Anshula Sachdeva, Vaishali and Shruti Katyul* qualified for Stage 2 in the same. *Ruchin Jain, Jitin Arora, Swati Negi and Shobhit Aggarwal* are in the final stage of the aforementioned competition.

## Workshops and Seminars

*Avinash Prasad, Abhishek Gupta, Shubham Kumar, Prateek Moon, Vishal Pandey* attended a Summer Internship program on Micro controller based Embedded System design organised by the TI centre for Embedded Product Design at NSIT.

*Mridula Garg* attended Capacity Building Workshop on e-Content Creation organized by Institute of Life-long Learning.

## Publications

*Purnima Yadav, Shrutika Sathenapally, Harmeet Kaur* published a paper on "Comparative Study of Sentiment Analysis Techniques and its Application on Twitter" in proceedings of the National Conference of Information Technology and Business Analytics (NCITA '2017), Jammu, India (January 7-8, 2017).

# ACHIEVEMENTS ( CO-CURRICULAR )

*Avishi Goyal* ( II year) secured first position in fine-arts competition organized by IIT Delhi.

*Kushal Chawla* (II year) won debate competition organized by Daulat Ram College and DTU Model United Nations Conference. He has also participated in various debates all over the country.

*Prateek Singh* (III year) was the Photography Head for TedX Hansraj College, 2016.

*Swati Bajpai* (III year) is NCC B certificate holder with the rank of Lance Corporal. She also attended CATC 2016-17 and received first prize in Talent Hunt organised there. She is a volunteer in BloodConnect, an organization to eradicate blood shortage.

*Ronak Aggarwal* (III Year) is the co-founder and vice president of Hans Symposium. He is also the technical head of SGA.

*Shoaib Rayeen* (III year) and *Shobhit Aggarwal* are head organisers of Equinox Hansraj.

*Aditya Gupta* (IV year) is the founding president of Hans Vision Society.

*Prakhar Gangrade* (IV year) was awarded the Excellence certificate for Fine Arts at 68th Annual Day of Hansraj College. He is also the president of Kalakriti, The Fine Arts Society of Hansraj College.

*Shrutika Sathenapally* (IV year) was the director and writer of the annual street play 'Riwayat' of Hansraj Dramatics Society.

*Harshit Bansal* (IV year) was the co-writer of the annual street play 'Riwayat' of Hansraj Dramatics Society.

*Mridula Garg and Abhishek Gupta* are members of the technical team of Hans Vision society.

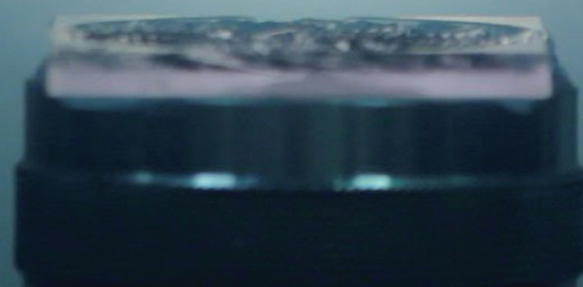
*Paras Jain* (III year) is the technical head of NSS and SPIC MACAY Hansraj.

*Vipin Kumar* (III year) is the technical head of Equinox Hansraj.

*Sheetal Kumar* is the technical head of Haritima (The Environment Society), Enabling Unit and Neenv (Human Resource Development Society). He is also a senior co-ordinator in SPIC MACAY.

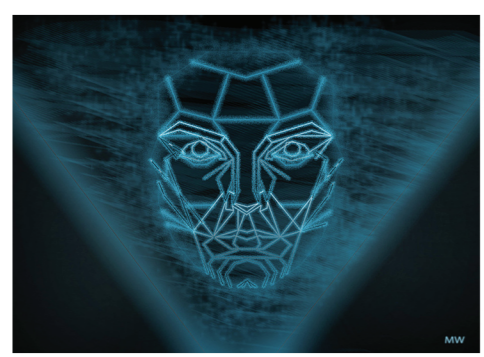
*Abhishek Rajput* is a senior co-ordinator in SGA (Society of General Awareness) and a member of Enabling Unit.

*Apporva Arya* is a member of Women Development Cell, Hans Symposium, SGA and Neenv.



# 3D ACOUSTIC HOLOGRAMS

Rima Datta



3D printing. 3D-printed plastic blocks can now be turned into acoustic holograms that generate 3D shapes made of 'sound' which can move objects in the fluid without even touching!

This all started last year when researchers from the Public University of Navarre, in Spain demonstrated how ultrasonic acoustic holograms can be used to manipulate things in mid-air, using arrays of ultrasonic transducers and some complicated programming. All those different sound waves can be generated without more than one transducer if you're clever and willing to make a few compromises.

That's the project that a crew from the Max Planck Institute for Intelligent Systems undertook this year. What's cool about the work done underwater by the researchers of this institute is that all they're doing is printing out a 3D surface and wiggling it up and down to make the waves. Conventional holograms are a special kind of 2D photograph that, when lit up, essentially turn into windows onto 3D

The pixels making up each hologram scatter light falling onto them in very specific ways, causing these light waves to interact with each other to generate an image with the illusion of depth.

The new acoustic holograms are plastic blocks with complex structures that scientists created using 3D printers. These printers form 3D structures by placing layers of material onto surfaces, much like how printers deposit layers of ink. When an acoustic hologram is placed in front of an audio speaker or a transducer, 15,000 pixels within it can scatter sound waves to generate complex 3D fields of sound in air or liquids. These waves apply pressure on matter to push, pull and spin objects such as small animals.

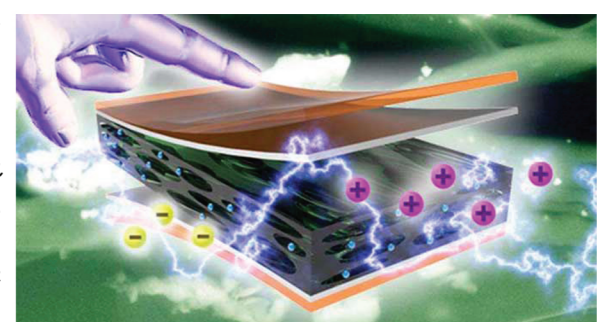
Acoustic holograms could help doctors sculpt powerful ultrasonic fields to get rid of unhealthy tissue while avoiding healthy areas. They could also help improve the resolution of ultrasonic imaging. Scientists are also exploring new areas where they can be applied. Let the era of novelty pond hacking begin!

# Soon, charge your smartphone with a finger swipe!

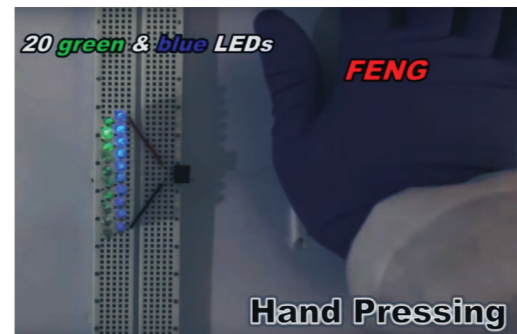
Hardik Dhayal

What is the biggest fear of our generation? Losing out on our phone's battery.

To make the case clearer, consider the crowded plug-in points on the metro, classrooms & at each and every public place, hell, even in our houses we are glued to our charging wires and trust me, we all have been in tangled yogic positions just to get our phones charged.



The bitter truth is that even though technology in all other sectors has grown leaps and bounds, the battery capacity has not reached that level where it could sustain a modern day smartphones' requirement.



But, what if, I tell you that an Engineering research team from Michigan State University has found a cure to all this mess. What if, I tell you that next time, at the end of your day, you won't be dreading to look at your phone's battery Percentage because... FENG.



FENG, short for Ferroelectret Nanogenerator, is a page-sized device which can convert human motion into electric Impulses. It is made using silicon as outer wafers with layers of silver, polypropylene ferroelectric, and polyimide slices as walls in between. A swipe of a finger or slight PRESSURE is enough to generate power from this low-cost, biocompatible device which can fuel our smartphones.

FENG has another neat trick up its sleeve too, with the ability to become more powerful when folded. The more you fold it, the more energy it creates and stores. A single film of FENG when folded again, and again, can be made small enough to put in a specially made heel of our shoe so it creates power each time our heel strikes the ground.



\*wink wink\*)

Imagine a student getting late for a class will not have to worry about his or her phone not being charged. It will get charged while running to attend the class or better play some game with intensive clicking and swiping in the lecture itself to charge it. (At owner's risk.

The more you move, or in the case of your mobile phone, the more you use it, the more power it generates. So in future we'll be able to generate electrical energy using our little fingers. Feels like a superhero. Doesn't it?

# FENG

# GAMERS MAKE GOOD SURGEONS

Bhawna Dagar

Grand Theft Auto, Call of Duty, Need for Speed, Super Mario, Pac Man, Star Wars Battlefront, FIFA.

Do they ring any bells? I guess they rang many bells. Everybody has a phase in their lives when they go crazy about one or the other video game. Well, for many it's just a phase and it passes and others are reading this article by passing what they were playing. Jokes apart. Wasn't there a time when everybody had their brains filled with stuff like "Video games are no good", "They are just a waste of time", "They make you lazy and fat" and all the negative? Gosh, these people never focus on positives! I have brought you something interesting and positive about our loving video games.

With the advancement in technology, we now have laparoscopic surgeries. And the surgeons who have played a good number of video games, have proved to be better surgeons than those who haven't. I am not blabbering or making things up, this has been proven. A study on 'whether good video game skills translate into surgical prowess' was done by researchers with Beth Israel and the National Institute on Media and the Family at Iowa State University. It was based on testing 33 fellow doctors — 12 attending physicians

and 21 medical school residents, who participated from May to August 2003.

This study showed the following: Surgeons who played video games in the past, for more than 3 hours per week, had 37% fewer errors and also had a 27% faster completion rate performing laparoscopic surgery and suturing compared to surgeons who never played video games. Moreover, surgeons who played selected video games just prior to conducting laparoscopic suturing performed the procedure faster and with fewer errors compared to surgeons who did not prep on video games prior to suturing. One of the video games used in the study was Super Monkey Ball, where players move a monkey that is inside a ball through an obstacle course. Remotely guiding surgical instruments inside a patient requires intensely fine finger movements, which Super Monkey Ball helps hone.

*"Surgeons who played video games in the past, for more than 3 hours per week, had 37% fewer errors and also had a 27% faster completion rate performing laparoscopic surgery and suturing compared to surgeons who never played video games."*

It feels like I am promoting Super Monkey Ball. But I am not. So now surgeons are employing interfaces similar to those in video games that operate by utilizing a joystick and buttons. Practicing in this manner can help increase hand-eye coordination, which strengthens surgical skills.

Being stuck on the gaming consoles is finally going to pay off. All you have to do is get admission in any medical college, become a surgeon and Bam! You've made it. Or you could just play the game you had paused & use this information for your defense when your mom comes.



# GOOGLE'S AI INVENTS ITS OWN LANGUAGE?

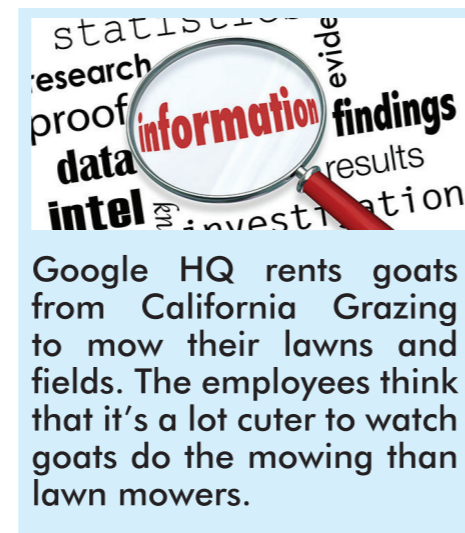
Satyam Santosh

All right, don't panic, but computers have created their own language and are probably gossiping about us right now. Well, that's just an oversimplification and the last part is blatant lie. In short, Google Translate just got brainier. By simply teaching the AI 'how to translate from Hindi to English and English to French', the system was able to translate from Hindi to French on its own (calling it zero-shot translation). Yes! It might seem silly to us, but thanks to Google's machine learning system called Google Neural Machine Translation (GNMT). Since September, Google Translate was fuelled by GNMT, which uses deep machine learning to produce better, more natural translation between languages. GNMT aims to improve how Google Translate works in translating languages by looking into entire sentence rather than words or short phrases. This architecture requires no change in the base GNMT system, instead uses an additional token at the start of the sentence to specify the target language.

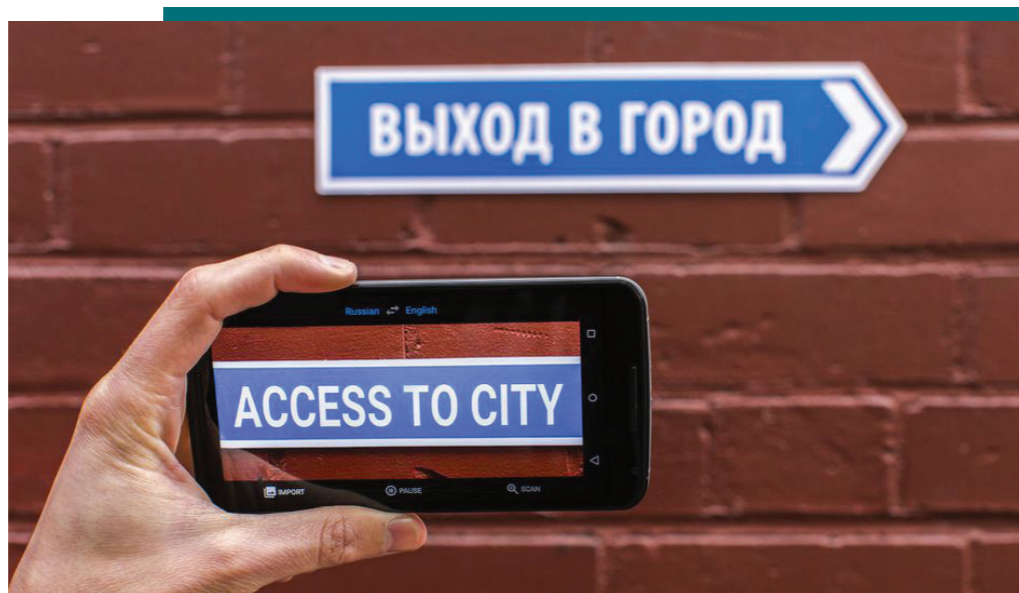
Based on how various statements

are related to one another in the memory space of the neural network, Google's language and AI experts think that it has developed an "interlingua". This "interlingua" seems to exist as a deeper level of representation that sees similarities between sentences in all the languages. Beyond that, it's hard to say, since the inner working of complex neural networks are famously difficult to describe. It could be something very sophisticated or something very simple. To put it in non-technical language, Google Brain can now learn any language without being given lessons. Google Translate supports over 100 languages and translates

over 100 billion words every day. The AI is not perfect yet and results have so far been reasonable. But the fact that it exists is pretty powerful stuff.



Google HQ rents goats from California Grazing to mow their lawns and fields. The employees think that it's a lot cuter to watch goats do the mowing than lawn mowers.



# CLOUD COMPUTING

Ashita Diwan

Chances are, when you leave the office at the end of the day you turn on the alarm system and lock the door to protect your office and its equipment. It is also likely that you have a safe or locking file cabinet for storing confidential business documents.

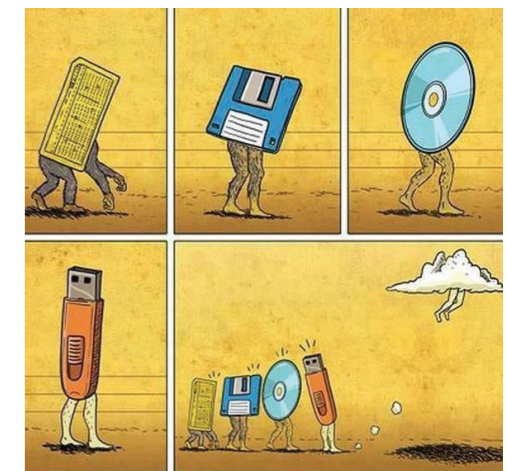
Your computer network requires the same kind of protection. Network security technologies protect your network against the theft and misuse of confidential business information and guards against malicious attacks from Internet-borne viruses and worms. Without network security in place your company risks unauthorized intrusions, network downtime, service disruption, regulatory noncompliance and even legal action.

Cloud computing involves distributed computing over a network, where a program or application may run on many connected computers at the same

time. It specifically refers to a computing hardware machine or group of computing hardware machines commonly referred as a server connected through a communication network such as the Internet, an intranet, a local area network (LAN) or wide area network (WAN). Any individual user who has permission to access the server can use the server's processing power to run an application, store data, or perform any other computing task. Therefore, instead of using a personal computer every-time to run the application, the individual can now run the application from anywhere in the world, as the server provides the processing power to the application and the server is also connected to a network via internet or other connection platforms to be accessed from anywhere.

In common usage, the term "the cloud" is essentially a metaphor for the Internet. Marketers have

further popularized the phrase "in the cloud" to refer to software, platforms and infrastructure that are sold "as a service", i.e. remotely through the Internet. The major models of cloud computing service are known as software as a service, platform as a service, and infrastructure as a service. These cloud services may be offered in a public, private or hybrid network.

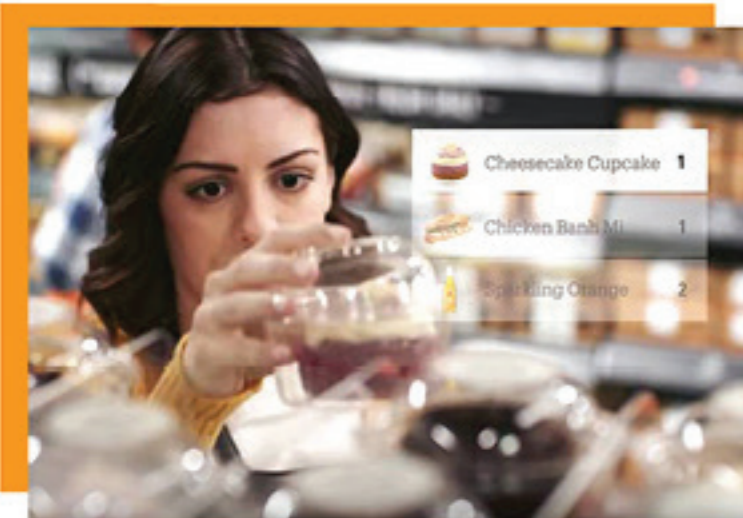




# amazon go

NO LINES, NO CHECKOUTS

Have you been to some restaurant and just left seeing how crowded the place was? Have you been in a queue for ordering your food? Let me answer these for you. All the time. This is the most annoying part of a store, be it for shopping or for food. Never ending queues. Ugh! Don't you just wish there was some gadget that could help skip this part and you directly get to pay? We'll try to get this in some other way. Fancy what would shopping look like if you go into the store, grab whatever you want and just go.



Sounds like a dream. Now that's just funny. But just the idea of skipping the annoying part of shopping makes shopping even more exciting. Well, that's what Amazon Go is about. The first question that pops into our heads is 'how'? How is it going to work? How can we skip the queues and reach directly to the billing section?

Technologically speaking, the 'checkout-free' shopping experience is made possible by the same type of technologies which are used in self-driving cars: computer vision, sensor fusion and deep learning. All together this is called 'Just Walk Out technology'. It detects when the products are taken out or returned to the shelves and keeps track of them in your virtual cart. Once you have picked the items, you are free to go. Shortly after you exit the store, your amazon account will be charged and a receipt will be sent. At least this is what is claimed. Grocery store chains talked about shoppers being able to bypass the checkout for decades. IBM and others have been pushing for RFID tags (old thinking) to be added to individual packages to allow 'that' to happen once the price of the tags fell below a half a cent; critics have debated the cost and the potential for personal information breaches. Both of these issues have delayed the technology from becoming mainstream. In fact, 50% of retailers with revenue greater than \$1 billion say that mobile technology is moving too fast to keep up, according to RSR Research. Shame on them; kudos to Amazon.

Since its a store, another question that might be haunting you is 'what'? What can you buy there? What are the different types of items available?

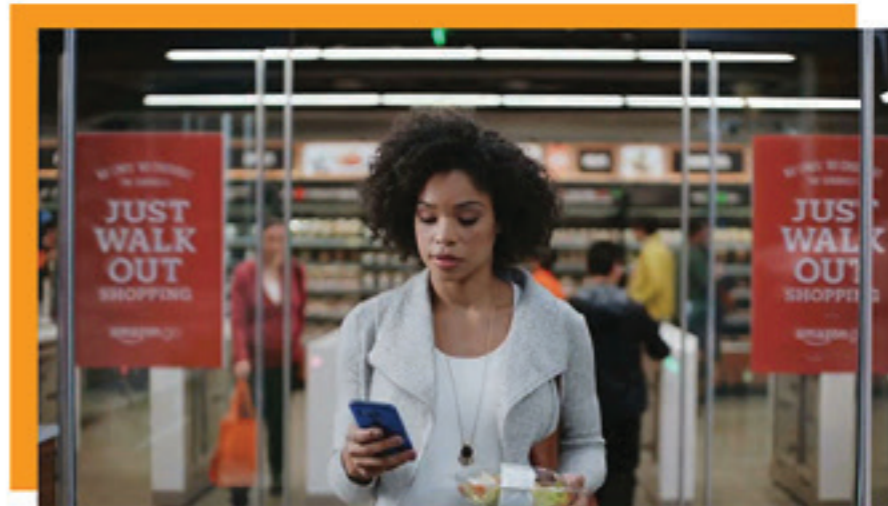
They offer delicious ready-to-eat breakfast, lunch, dinner, and snack options made fresh every day by their on-site chefs and favorite local kitchens and bakeries. Their selection of grocery essentials ranges from staples like bread and milk to artisan cheeses and locally made chocolates. You'll find well-known brands, plus special finds. For a quick home-cooked dinner, pick up one of their chef-designed Amazon Meal Kits, with all the ingredients you need to make a meal for two in about 30 minutes.

All you need is an Amazon account, a supported smartphone, and the free Amazon Go app and you are good to "Amazon Go".

All the foodies must have stopped it reading by now and started googling it perhaps. "Where is this amazing store?"

Presently, this store is located at 2131 7th Ave, Seattle, WA, on the corner of 7th Avenue and Blanchard Street. Amazon Go is currently open to Amazon employees in their Beta program, and will open to the public in early 2017.

Let's just hope it arrives soon in India. Amazon is pushing the limits of technology and is always bringing something



new and exciting for us. I personally am intrigued by this concept of Just Walk Out technology and I wish that this is not just eatables, but every commodity which becomes available with such an ease.

And it will be done soon. Because this is the future of Shopping. It's Amazon.

## JUST WALK OUT SHOPPING :)



# Augmented Reality

SAME WORLD  
NEW VISION

Yash Shah

**R**emember the most fussy and chaotic spot you often encounter? Surely, a new street with no information. Imagine bubbles floating before your eyes, filled with cool info about stuff you see on the street. Science fiction? Nope. It's augmented reality. And one day it'll be as routine as browsing the Web.

It's not always the friendliest of places. We get lost in unfamiliar cities; we meet people whose language we don't understand. Well, technology is there to rescue human conflict. Technology has come up with Augmented Reality to create a virtual environment with the aid of informational graphics and audio that will change the way we experience the world forever.

Augmented Reality (AR) is a live direct or indirect view of a physical, real-world environment whose elements are augmented (supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data. AR solutions actually use a live camera feed of the surroundings with an overlay of generating objects which make them much more natural to use, and allow a better sense of context for the user.

With the help of advanced AR technology (e.g. adding computer vision and object recognition) the information about the surrounding real world of the user becomes interactive and digitally manipulate-able. Information about the environment and its objects is overlaid in the real world. This information can be virtual or real, e.g. seeing other real sensed or measured information such as electromagnetic radio waves overlaid in exact alignment with where they actually are in space. Augmented reality brings out the components of the digital world into a person's perceived real world.

Technologies used in rendering Augmented Reality include optical projection systems (like the windshield of cars), monitors, hand held devices (smartphones), and display systems worn on the human body like eyeglasses, head-up displays (HUD), and also Spatial Augmented Reality using digital projectors onto physical objects.

Using AR technology and field depth Microsoft managed to invent smart-glasses which can help blind see. With the glasses, he can scan his surroundings to figure out not only who's in front of him, but also the system's best guess as to their mood. For someone without sight, it's a powerful tool.

SMARTPHONES combine fast CPU's with displays, cameras, graphics acceleration, compass, GPS sensors and even gyroscopes. Combining these technologies has led to the recent emergence of mobile applications that utilize location sensing to provide users with relevant geo-referenced information. Smartphone apps, such as Wikitude and Layar, orient users to information about their surrounding area.

Inside newspapers and magazines, it is possible to create special content areas targeted to advertisers. By a suitable AR tag these areas can trigger visualization of digital content such as video, audio, 3D animations just as we see in Harry Potter movies. This scenario requires appropriate AR tags similar to QR codes or generic image recognition technology.

AR technology inside books can help to create a virtual story which would be easy to understand by the user and create immersive reading experiences.

*So now get ready to see the same world: Just Revealed!*

BEST AUGMENTED REALITY APPS OF 2016:

- 1: POKEMON GO
- 2: INK HUNTER
- 3: GOOGLE TRANSLATE
- 4: INGRESS
- 5: QUIVER

# EXPERT SYSTEMS

Mridula Garg

Expert System is an intelligent computer program that uses knowledge and inference procedures to solve problems that are difficult enough to require significant human expertise for their solutions.

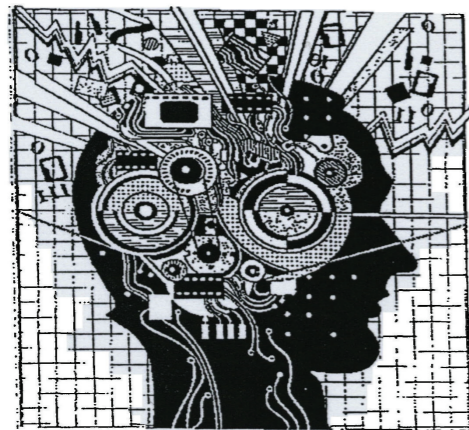
"I talk to myself because I feel that sometimes it is necessary to take an expert's advice". The person who came up with this should know that this is amazing but not practical. Talking about real life, we know that personally or professionally we come to certain bridges that cannot be crossed without someone's advice who we expect to be an expert in that particular field. That is, seeking the best possible solution to our problem requires knocking doors of the experts. Technology, trying to solve all of our problems, has not spared even this one. As a solution or should I say "a wannabe replacement" for human experts, we have Expert Systems.

The expert system is an artificial intelligence program that has expert-level knowledge about a particular domain and knows how to use its knowledge to respond properly. Domain refers to the area within which the task is being performed. Ideally the expert systems should substitute a human expert. It is a branch of artificial intelligence introduced by researchers in the Stanford Heuristic Programming Project. Like everything has a beginning, so does the idea of Expert Systems. There was a professor at Stanford University, Professor Edward Feigenbaum, who came

up with the idea of a need for a program that could solve human problems that cannot be solved by significant human expertise. And in the 1970s he gave his idea a life in the form of Expert System. He defines it as "an intelligent computer program that uses knowledge and inference procedures to solve problems that are difficult enough to require significant human expertise for their solutions."

Most importantly, where this technology plays its part is many industries including financial services, telecommunications, healthcare, customer service, transportation, video games, manufacturing, aviation and written communication.

Expert Systems, when limited in their area of expertise, can perform exceptionally well. But the question which has been around since forever is "Can they replace human experts?" Well, it's like asking "Would you permit some robot to perform an operation on you?" Absolutely not! The robot is only as good as the information that is loaded onto it. Would you trust the code "you" wrote to carry out a delicate eye surgery, knowing that one tiny logical error would be enough to lose your sight forever? The conclusion is that they cannot replace human experts. At least for me. What do you think?



There is no way around it. Smoking is bad and not just for humans, but for Robots as well. Well, I know that nobody cares and smokers are going to smoke. The first complication that a smoker faces is, the intense coughing and lung infections. So if you are one of those stuck at this stage, then thank technology for developing a Robot that is going to help you figure out the problem that causes coughing and infections or should I say chronic obstructive pulmonary disease. Yes, you heard me right. There is a chain smoking robot developed with the sole purpose of unravelling the mysteries associated with the lung problems that a smoker faces.

Here's how it works. It is composed of a rotating cigarette holder which is loaded with as many as 12 cigarettes. Then the robot fires up each cigarette with a lighter right out of a car. Then they program the machine to huff away at customizable intensities and frequencies. The robot passes smoke into what's known as a lung on a chip, which mimics a human airway. This transparent chip contains a channel of living lung cells, which produce mucus and hair like structures called cilia that ferry the mucus around. Connected to this channel are tubes that move smoke in and out. One chip is loaded with lung cells from a

## CHAIN SMOKING ROBOT

Bhawna Dagar

patient with pulmonary disease and another chip with cells from a healthy patient. It is then observed how the two react differently to smoke.

A question that might have started haunting you is "Did it work?" So let's try to understand what happened. When this study was conducted, researchers found 335 changes that were caused by smoking. They say that the changes they found are consistent with the other studies of gene expressions in smokers. This further confirmed that their model was an exact replica of a smoker's lung. The changes they saw happened pretty quickly just after 9 cigarettes. Since the researchers can see right into the chip, they could observe the beating cilia moving mucus around. They observed how the smoke freaked out this cilia a bit and it started beating at irregular intervals rather than at their standard rate. This weakening cilia results in cough as well as the extra mucus. Finally an explanation for smoker's cough!

Half of you might go all defensive

saying "Hey, I only go for e-cigarettes". So this electronic smoker accepted the challenge of e-cigarettes as well and turns out that the weakening of cilia was not observed in this case. Hence an evidence that they are safer than the actual ones.

Another question which popped up in my head and might be disturbing for some of you people is "Why do we need a Robot. Can't we stuff up rats and experiment on them or something like that?" Well, yeah, we can, but the thing is our lungs are different from a rat's. A Robot which has the exact replica of our lungs would provide better results than rats or any other alternative.

We humans are the trouble magnets. Even when we know that something is dangerous, we just have to do it. To me this all feels like a sci-fi movie where humans always get into trouble and technology, the hero, is there to save the day.

# BIG DATA



## HOW BIG IS BIG DATA?

Ashita Diwan

Science, as in other fields, is not a buzzword-free and one such word doing the rounds is “Big Data”. Just how big is “big”? And is there any use of spending money and producing a large amount of data in India when the West is already pumping so much data into public databases?

Today, companies, both at home and globally, are waking up to the value of data. The growing interest in big data has obviously to do with the fact that it is worth big bucks. Driven by the explosion of social media, the all-pervasive use of mobile networks and cloud storage, data has gotten bigger and bigger, so much so that the term ‘big data’ — used in tech parlance to refer to data sets that are large and tough to manage — has come to be known as one that has no prescribed upper limit. As storage capacity, computing power and parallel processing capabilities expand, the value of data is being realized better. That is, huge amounts of data (this could be data generated within the enterprise or data on it generated online or on social media) is being crunched to create insights or meaningful information. And increasingly, this

process, which used to take hours and even days, is now being done in real time. While tools such as Hadoop allowed for real-time analysis of data, Google’s Dremel and other Open Source implementations that are developing in this ecosystem, allow for ad-hoc querying of big data in real time. More and more businesses, even in India, are looking to crunch their large data sets to see what works and what doesn’t. And people are seeing the value in that. Earlier, people were not enthusiastic about storing data, but now they know that the data contain insights that can aid crucial decision-making.

Even the government these days, is getting to adapt to the new tech environment. Recently, the Indian government integrated the data with the services and welfare schemes offered to the people. All authentications so far were being done primarily based on the Aaadhar number. It helped in huge savings and eliminating corruption and fake beneficiaries.

Big data is analysed for bits of knowledge that leads to better decisions and strategic moves for overpowering businesses.



# BLUE BRAIN

Rima Datta

Ever imagined that your intelligence, feelings, memories and knowledge could serve the society even after your death? I guess not. But the scientists have shown that it’s pretty much possible. Wanna know how?

“Blue Brain” - The world’s first virtual brain will make this dream come true. Virtual Brain is a machine that can function as the human brain. Today, scientists are trying to create an artificial brain that can think, respond, take decisions and keep anything in memory. The main aim is to upload human brain onto a machine. And after the soul has shared it’s clothing, the virtual brain will act as the man.

Why do we need Virtual Brain?

We develop because of our intelligence. Intelligence is the inborn quality that cannot be created. And if we were to quantify this quality on a graph, there would be skyrocketing buildings for some compared to others which makes them unable to think to great extents. Having reached the top of all the species, such intelligence is always welcome. But the intelligence is lost, along with the body, after death. Solution? The Virtual Brain.

It can be the solution of all our petty problems likeremembering people’s names, their birthdays, and spellings of complicated words (like pneumonoultramicroscopicsilicovolcanokoniosis. I kid you not, it’s a word), important

dates, history, facts, and the list go on and on. And as lazy as we are, we always want to relax. So why not use a machine to assist us? Or even better, what if we upload ourselves onto a computer and live in it as a program? Reminds me of Westworld. Doesn’t it?

So how do we upload the human brain onto a computer? Ugh! The scary question.

Not undermining the complexity of the human brain, IBM is now in search to practically realize this miracle. The most promising solution they found, is the use of very small robots or “nanobots”. These robots will be tiny enough to travel throughout our circulatory systems. Travelling through the spine and brain, they will be able to monitor the activity and structure of our central nervous system. They will also be able to provide an interface with computers that is as close as our mind can be while we still reside in our biological form. Nanobots can even scan the structure of our brain, providing a complete readout of the connections between each neuron. This information, when entered into a computer, could continue to function—just like we do. All that is required is, a computer with a large enough storage space and very high processing power.

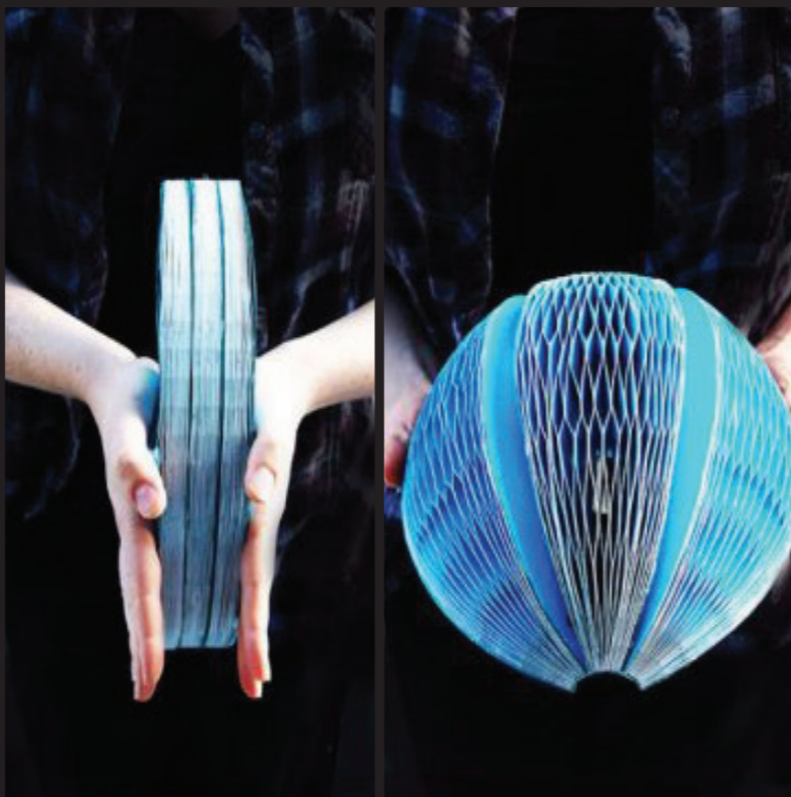
So you would be able to see the “image of your own intelligence” while you’re still alive! Sounds too creepy? Yes, it does. But it would certainly be fun.



## SOME LATEST INNOVATIONS

### ECOHelmet

A lot of people like cycling and it is the healthiest and ecological way to get around in cities. Around the world, bike share programs are giving commuters and tourists a convenient, inexpensive way to move from point A to point B. But in busy cities accidents often happen due to negligence of use of helmets, but it is tedious to carry helmets with you around all the time and rental helmets are unsanitary and ill-fit. Somewhere, at some point we all face this situation. Same happened with Isis Shiffer, a graduate of the Pratt Institute of Design in New York so she designed an ecohelmet, made entirely of cardboard, folds up accordion-style to about the size of a banana and is compact enough to fit in a laptop bag. It unfolds to fit just like a traditional helmet, cushioning the wearer's head with 'honeycomb-patterned paper' that absorbs and distributes impacts, protecting cyclists from injury. So now we can ride whenever we like without the fear of our safety!



### NIGHTMARE MACHINE

We all play pranks, we often scare people around us or should I say we use their fears against them. Well, now there is a technology to do all of that, Pinar Yanardag, Manuel Cebrian, and Iyad Rahwan developed a nightmare machine. Yes, you read it right, it is nightmare. It uses AI to turn the normal things into your worst fears. Not just photographs of people or cartoon characters, there are haunted places, toxic cities and inferno. According to the developers, Halloween has always been a time where people celebrate what scares them, so it seems like a perfect time for this particular hack. The trio used 'deep learning algorithms' to 'teach' a computer how to transform a regular photo of a face or place into something straight out of your worst nightmare—hence the name. Hope you put the kids to bed for this one because the Nightmare Machine delivers on its terrifying promise. I hope, for all our sakes, there aren't any clowns in the mix.



### ON-BODY TRANSMISSION

The world is becoming digitized and with that there is an increased concern of security. When you send a wireless Wi-Fi signal, it's broadcasting everywhere. Any eavesdropper who's listening in on this particular Wi-Fi channel can hack into the stream and try to break that encrypted password. The only way to get around this problem would be to remove signals from the air altogether. Now, University of Washington computer scientists and electrical engineers have devised a way to send secure passwords through the human body, i.e., On-Body Transmission — using benign, low-frequency transmissions generated by fingerprint sensors and touchpads on consumer devices. "Let's say you want to open a door using an electronic smart lock," "You can touch the doorknob and touch the fingerprint sensor on your phone and transmit your secret credentials through

your body to open the door, without leaking that personal information over the air." It works in different postures like standing, sitting and sleeping. The system uses signals that are already generated by fingerprint sensors on smartphones and laptop touchpads. What is cool is that for the first time that fingerprint sensor can be re-purposed to send out information that is confined to the body. While the team's system only works on an intimate scale, a truly secure method for wireless communication — even just at short range — could unlock new possibilities that go beyond just smart locks and wearable medical devices.

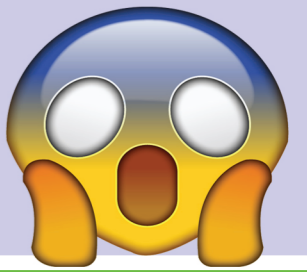


On an average at least 6000 viruses are created every month. Scared? Simply switching to Linux OS should do the work because technically they do not get affected by viruses (almost).

01

09

If you were to have your picture taken by the very first camera, you'd need to sit still for 8 hours.



02

Apple was the favorite fruit of founder Steve Jobs. He was three months late for filing a name for the business, and he threatened to call his company Apple Computers if the other colleagues didn't suggest a better name by 5 o'clock that day.



The first alarm clock could only ring at 4am.

10



There are 6.8 billion people on the planet and 4 billion of them use a mobile phone. Only 3.5 billion of them use a toothbrush.

03

11

Ada Lovelace an English mathematician and a writer, is considered as the first computer programmer. She is known for her work on the "Analytical Engine". Her notes on the engine served as the first algorithm to be carried out by a machine.



04

NASA computer were hacked by a 15 year old hacker. It caused a 21-day shutdown of NASA computers. More importantly he didn't stop here, and hacked Pentagon weapons computer too.



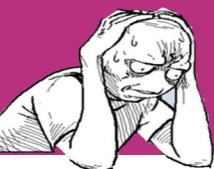
iloveyou is considered to be the most dangerous virus ever created in the form of a worm. It has the ability to replicate itself and crash the system. It arrived through e-mail messages as a love letter. When a user opens the email and clicks on the attachment available, the virus starts its magic.

12



CAPTCHA is used to distinguish computer from human. No computer has got success in solving captcha till this date. CAPTCHA stands for "Completely Automated Public Turing test to tell Computers and Humans Apart"

05



06

Ubuntu is one of the more popular distributions of Linux. The word Ubuntu comes from an African word meaning "I am because of you".



07



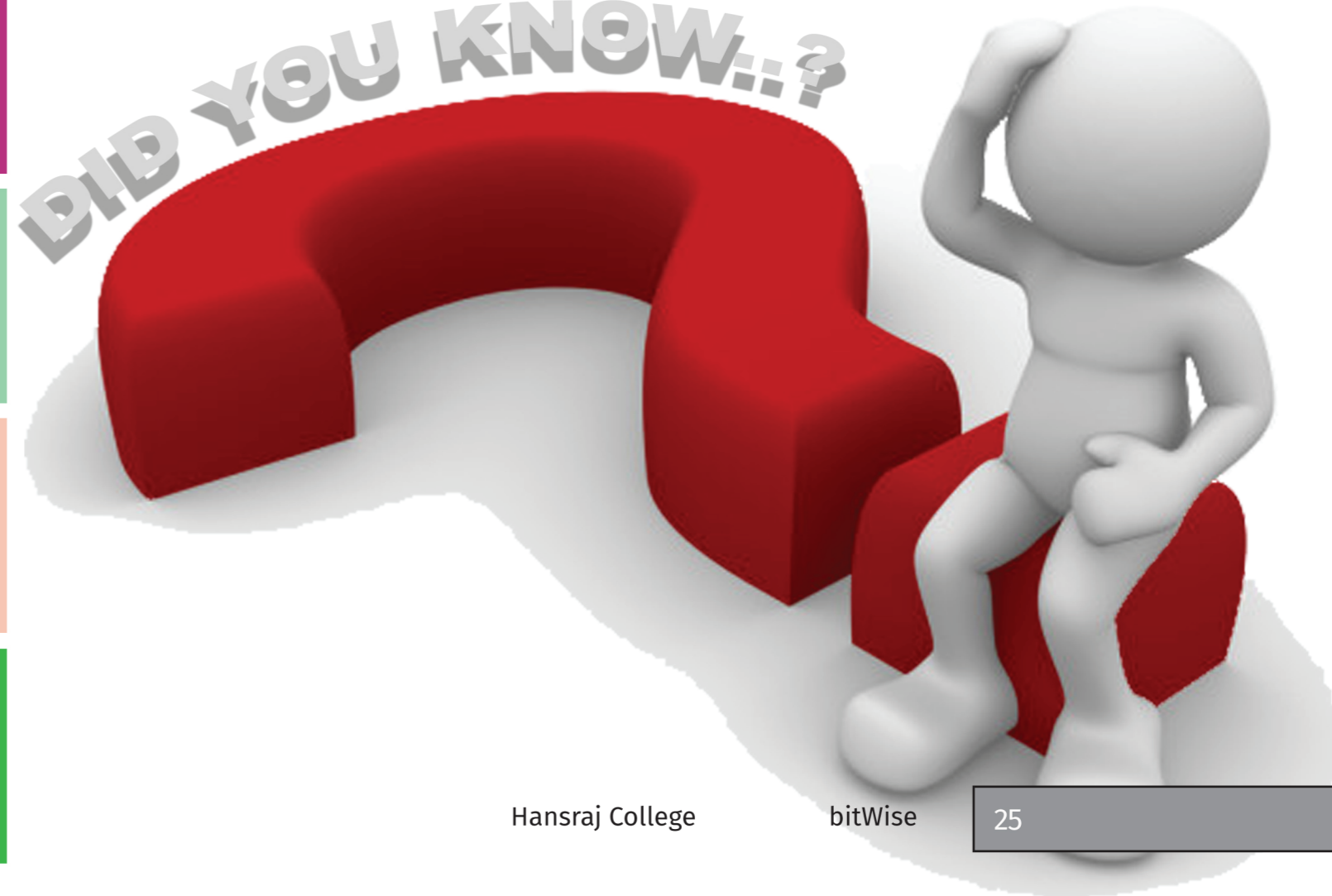
Bill Hewlett and Dave Packard tossed a coin to decide whether the company they founded would be called Hewlett-Packard or Packard-Hewlett.

08

If a computer is designed which is as powerful as the human brain. Then it would be able to perform about 38 thousand trillion operations per second.



DID YOU KNOW...?



# FACULTY MEMBERS



MR. SANJAY BATRA  
ASSOCIATE PROFESSOR  
M.C.A



DR. HARMEET KAUR  
ASSOCIATE PROFESSOR  
M.C.A | Ph. D



DR. BALJEET KAUR  
ASSISTANT PROFESSOR  
M.C.A | Ph. D



DR. MANOJ AGGARWAL  
ASSISTANT PROFESSOR  
M.C.A | Ph. D



MS. SUNITA CHAND  
ASSISTANT PROFESSOR  
M.C.A | M.Phil | M.Tech



MS. ALKA KHURANA  
ASSISTANT PROFESSOR  
M.C.A



DR. MANJU  
ASSISTANT PROFESSOR  
M.Sc | M.Tech | Ph. D



DR. BHARTI RANA  
ASSISTANT PROFESSOR  
M.C.A | M.Tech | Ph. D



MS. AARTI GOEL  
ASSISTANT PROFESSOR  
M.C.A | M.Phil



MRS. DIVYA  
ASSISTANT PROFESSOR  
M.C.A



MRS. NISHI SINGH  
ASSISTANT PROFESSOR  
M.C.A | M.Tech



DR. SAMIKSHA GOEL  
ASSISTANT PROFESSOR  
M.C.A | Ph. D



MRS. NEELAM DABAS  
ASSISTANT PROFESSOR  
M.C.A | Pursuing Ph.D

# EVENTS DURING 2016-17

## CALENDAR



## 01

### CAREERS IN I.T AFTER GRADUATION

In today's highly competitive world, every individual wants an opportunity that enables him/her to stand tall and independent amidst the crowd. The Information Technology industry, over the past few years, has been offering employment to many enthusiasts. To enlighten the students about the various career opportunities, the Computer Science Society organized a session on "Careers in IT after graduation" by Landmark Institute on 20th October 2016. Mr. Ritukar Chadha (M.Sc. Mathematics), Director of the institute was the speaker of the day. He began by an interaction with the students about their goals. He then proceeded by highlighting the facts about growing IT industry. The main focus of the session was to make the students aware of how to pursue an MCA degree. He told about various universities offering MCA, the

entrance exams to get into them and also pattern of the paper. At the end, Dr. Harmeet Kaur Negi proposed the vote of thanks. This session proved to be a pathfinder for all the students.

## 02

### CODEFLICKS THE CODING COMPETITION

Ordinateur, the computer science society, Hansraj College, organized *Codeflicks* - a coding competition for the students of all years on 4th October 2016.

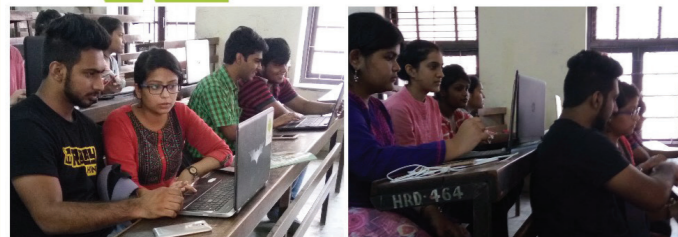
The competition aimed at encouraging the coding streak amongst the students. Students participated in teams of two or individually. The competition was conducted in 2 rounds - prelims and finals. The preliminary round required the participants to qualify a written test that had C/



C++ & aptitude questions. 8 teams made it to the finals. The final round was conducted online on CodeChef. This round required students to solve 5 programming problems in 2 hours. After a neck to neck competition, the team from B.Tech 4th year won the competition by successfully completing 4 out of the five questions. It proved to be an excellent platform for students to showcase their coding skills.

03

### GOOGLE'S APPLIED CS WITH ANDROID WORKSHOP



In today's fast evolving world, with such intense competition, it is essential for students to prepare themselves for life after graduation. In an attempt to provide such an opportunity to the students, Ordinateur, the Computer Science Society hosted "Google's applied with Android Workshop" for the students of Hansraj College. This program has been designed by Google for University level Computer Science students to apply the theoretical concepts learned in class in a professional setting. Because of the overwhelming response from the students, the workshop was conducted in two batches where each batch was given 4 hour sessions on 3 consecutive Saturdays. Sessions for the first batch were conducted from 3rd September 2016 to 17th September 2016; and for the second batch from 24th September 2016 to 8th October 2016.

The Workshop was facilitated by Piyush Panwar, a student of B.Tech Computer Science at Hansraj College. The facilitator made the students work in groups to encourage teamwork as well as to nullify the knowledge gap between the first years and the final year students. The Program is modeled on a self-learning mechanism wherein the students teach themselves how to solve the problem. The workshop turned out to be a great learning experience.

04

### DOCUMENT WRITING IN DEVANAGRI



A workshop with the collaborative efforts of the departments of Sanskrit and the Computer Science was held on 29th September 2016 to give hands on experience to the participants for typing documents in MS Word using the font Chankaya Walkman. The two hour long workshop covered the span of typing all possible intricacies of the Devanagari. The Devanagari script is used for over 120 languages, including Hindi, Marathi, Nepali, Pali, Konkani, Bodo, Sindhi and Maithili among other languages and dialects, making it one of the most used and adopted writing systems in the world. The Devanagari script is also used for classical Sanskrit texts.

05

### INTRA-DEPARTMENT FOOTBALL TOURNAMENT

Ordinateur - The Computer Science Society, Hansraj College organized its first ever *Intra-Department Football Tournament*.

Game : 40 minutes ( with a half time of 20 minutes each) excluding a break of 10 minutes. The tournament started with students from II year beating those from I year by a comfortable margin of 4-1. In the next match, freshers proved their mettle by defeating the final year students by 2-1. Final year students won the last match beating the sophomores by 1-0. II year students finally won the tournament as per the rule of maximum goal difference. Abhishek Paswan scored maximum goals in the tournament.



06

### CYNOSURE 2016 THE ANNUAL TECH SYMPOSIUM

The Computer Science Society of Hans Raj College organized its two-day *Annual Tech Symposium, Cynosure 2016*, on 21st and 22nd January. The first day of the symposium, Herald, was organized in three sessions.

Herald began with the inauguration ceremony in Yoga Room and a small address by Dr. Rama, Principal, Hans Raj College, who congratulated the CS Department for conducting such a mega event. Then, there was a talk on Information Science by Prof. S. K. Muttou, HOD, Department of Computer Science, University of Delhi. This was followed by a tea break. Second session started off in Seminar Room with a talk by Mr. Chi-

ranjeev Singh, MBA (IIM-A graduate). He motivated students and urged them to be optimistic towards life. His talk was followed by another talk on "Life and its turns" by Ms. Nishi Aggarwal, an Alumnus of Hans Raj College. She shared her experiences of the corporate world and guided the students about their forthcoming professional lives. Herald ended with a seminar by WebTek Labs Pvt. Ltd.

Day two of the symposium began with the inauguration ceremony in the College Auditorium at 10 AM. Bitwise, the department magazine of Computer Science was also released during the ceremony. The second day executed with a total of 18 events planned and organized at its best of quality. Over 1000 participants from colleges across Delhi participated in these events. Technical events comprised of events like Code-A-Baton, Swat the Bug, Webapocalypse, Technologically Challenged, Cipherena, Montador etc. Non-technical events comprised of Gully cricket, Treasure Hunt, Fantasy Cricket League, Debate and GD, Logo Designing, Photography, Poster Designing, Gaming and Surprise event. Events like Ludophilia, which comprised of multiple "minute-to-win" games like Golgappe eating Competition and other IQ games, attracted many students with non-technical background.

The winners were encouraged with cash prizes, goodies and certificates for almost all the events. A team from DTU bagged the first position in the coding competition whereas a student from Keshav Mahavidyalaya won the debugging competition. Cipherena was a tie between two teams. Two students from Vivekananda Professional Institute won the web designing competition. Cynosure ended with the prize distribution ceremony in the Seminar Room at 5 PM. Dr. Harmeet Kaur and Dr. Baljeet Kaur encouraged all the winners. Cynosure was successful in achieving its aim to allow students from different colleges and departments to interact in an atmosphere of technology. It provided the necessary stimulus for everyone to test their abilities beyond the confines of a classroom and discover the limits of their potential. This Annual Tech Symposium was a great success with the support of all the teachers, members of the society.

# BITWISE TEAM

## 2016-17



1. Bhawna Dagar
2. Ashita Diwan
3. Mridula Garg
4. Sakshi Yadav
5. Hardik Dhayal
6. Rima Datta
7. Sheetal Kumar
8. Yash Shah
9. Avishi Goyal
10. Shruti Katyal
11. Satyam Santosh

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# ORDINATEUR

Computer Science Society  
Hansraj College