April 2015

Intelligent Pills

Lab on a Chip

Brain Implants

Unambiguious
Storage
Interpretations
Representation
Approximation
Octet
Encode
Sequence
Alphabets
Hexadecimal
Alphanumeric
Decibles
Kilo
Operating System
Contigious
Web
Bit
Computing
Digital
Uppercase
Calculations
Logarithematic
Implementation
The
Bel
Standardization
Ambiguity
Lowercase
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Char
Language
Byte
Design
Address
Giga
Prefix
Transmission
Algorithms
Int
Blog
Number
Storage
Unsigned
Analysis
Architecture
Development

# (An e-Magazine of CSE Department of IMSEC Ghaziabad)

Artificial Retina

# TECHNOLOGIES IN HEALTHCARE

Contact Lens Detects Glaucoma

Sensor Technology

Printing New Skin

**World Health Day**
**7th April 2015**

Artificial Pancreas for Diabetics

THE BYTE An E –Magazine of CSE Department
VOLUME –VIII , APRIL 2015

Look up Inside

## ARTICLES



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# THE BYTE

ISSUE VIII , APRIL 2015

# ARTICLES

# What will the Semantic Web look like 10 years from now?

Anurag Mishra, Asst.Prof, CSE

*Source:11th International Semantic Web Conference 2012*

The Semantic Web, as a field, is undergoing a major shift. After 10 years of mainly foundations-driven research, we now see strong indicators that Semantic Web methods are entering mainstream technology, in a number of forms. The consequent rise in commercial interest will likely have a fundamental impact on the field. Some established research results will make it into mainstream applications. Others will become obsolete. Radically new ideas will emerge. It is thus the right time for the community to contemplate the way ahead. It is always good to try to look ahead and anticipate the development of a field.

For the Semantic Web, it is now particularly important because recent developments indicate that Semantic Web technologies are entering the industrial mainstream. Schema.org and the Facebook Open Graph Protocol are bringing metadata to bear on the Web large-scale. IBM's Watson and Apple's Siri incorporate Semantic Technologies. Google is revamping its search approach and is going more semantic in implementing their knowledge graph. And these are just a few of the prominent examples.The commercial uptake will be a game-changer for the field. It seems that only a fraction of the research results of the past ten years are currently being picked up. It seems that shallow semantics brings added value in many, but not all, application areas. In others it seems that there are roadblocks for which deep semantics is required for added value - but current approaches are still limited. Linked Data and Big Data are popular buzzwords right now, but could they be hitting a peak on the expectation curve? If so, what is going to happen in the subsequent dive? If not, how will those areas affect the field's future?


# Bridging Software Communities through Social Networking

**SOURCE :** PUBLISHED BY THE IEEE COMPUTER SOCIETY

**OVER THE PAST** decade, the advent of social networking has fundamentally altered the landscape of how software is designed, developed, and used. It has expanded how communities of software stakeholders communicate, collaborate, learn from, and coordinate with one another. In many cases, social networking has eliminated boundaries and upended traditional hierarchies that previously may have constrained the flow of information within and between organizations,[1,2] while also allowing user communities to easily share usage information with each other and to communicate with developers directly.

## The Rise of Social Networks

For software engineers, the rise of social networking sites is allowing them to communicate with development team members within and between organizations so that they can maintain awareness of one another's activities, share technical and software process information, and more efficiently coordinate development on software products. Entrepreneurs with product ideas are employing crowdsourcing to entice developers they don't even know to write code for them. Web-based social networking services, such as Twitter and Facebook, enable requirements engineers, customer support workers, marketers, and customers to talk with one another. These fast and lightweight communication media are helping customers to perceive that their interests are being heard and they're enabling organizations to follow trendsetters and influence public opinion about their products. Software forges with social media features further support the ability of millions of software product communities and value-added providers to establish software-platform-focused ecosystems and help teams efficiently leverage an entire platform's worth of technology to quickly develop a software product from common components.

Social networking sites also support extensive internal and external ecosystems that build solutions on top of products, product lines, and platforms. For the platform provider, facilitating ecosystem communication and collaboration increases customer value and inhibits the customer from switching to alternate products. The use of ecosystem-centric software marketplaces gives software producers a significant degree of market access that would have been much harder to achieve in the past. Customers, in turn, can use these marketplaces to discover and acquire software written by organizations of any size, and offer feedback and ratings that help producers improve the next version. Organizations foster their own socially networked communities of developers, value-added providers, and customers to provide product information, access to insider knowledge, and the ability to share questions and answers with each other in real time. Product developers heed what customers say about the product and use that information to improve and enhance future software designs. Independent hacker communities self-organize around popular consumer gadgets to share tips, tricks, and software, thus extending these devices for uses far beyond what their original producers ever imagined.

## In This Issue

We offer three articles by researchers who recognize and support connected communities of stakeholders (customers, value-added providers, third-party software vendors, customer support workers, marketers, requirements engineers, testers, and developers) at all scales (from individuals and teams to platforms, organizations, and ecosystems of organizations). We hope that readers will learn how social networking can play a role in all aspects of the software product life cycle—from conception and development to delivery, use, and reuse—and understand the potential advantages and possible challenges that lie ahead.

The first article, "Uncovering Latent Social Communities in Software Development," by Damian A. Tamburri, Patricia Lago, and Hans van Vliet, presents a first step in studying the social communities that develop large systems. Observing the behaviors of individuals in the social community can offer valuable indicators for the prospects and risks in large-scale software development.

The second article, "Leveraging Transparency," by Laura Dabbish, Colleen Stuart, Jason Tsay, and James Herbsleb, relates the use of social networks with flexible, distributed version control to provide a radically different approach for coordination and communication in next-generation development environments. The article presents a case study around GitHub that shows how activity feeds lead to greater transparency, higher productivity, and less wasteful communication during software development.

The third article, "Assessing Technical Candidates on the Social Web," by Andrea Capiluppi, Alexander Serebrenik, and Leif Singer, offers advice to recruiters and job seekers on how social networking sites can be exploited to discover and evaluate the software-related portfolios of software engineering job candidates. The authors explore the pros and cons of using casual and professional social networking sites, social code sharing sites, question and answer forums, and profile aggregation sites to evaluate candidates' qualifications and references. It gives advice to job seekers on how to present a positive and authentic picture of their knowledge, skills, accomplishments, and social connections to attract the attention of recruiters.

## Practitioner Viewpoints on Social Networking

As an added bonus to this special issue, we report on interviews with the designers of four popular software-related social networking sites on the Internet: GitHub, MSDN, Stack Exchange, and TopCoder. Through these interviews, we explore how social networking enables organizations to achieve their goals of connecting software communities with one another. Brian Doll, a marketer at GitHub, explains how his company created a vibrant, interconnected set of software communities by adding social networking features to a Web-based software repository. Doug Laundry, a principal group program manager at Microsoft, talks about the design rationale and challenges behind the last 10 years of social feature development on the Microsoft Developer Network portal. David Fullerton, the vice president of engineering at Stack Exchange, tells us how question and answer websites are used by communities of experts to curate knowledge on topics of interest to those communities.

> Social networking has eliminated boundaries and upended traditional hierarchies.

**Special points of interest:**

- Supreme Court ruled on 25 March'15 the Information Technology Act
- It allowed police to arrest anyone posting "annoying" or "offensive" content on social media.
- A conviction can fetch a maximum of three years in jail and a fine.

# SC strikes down the Section 66A of IT ACT

## Section 66A

Supreme Court ruled on 25 March'15 striking down a much criticized and much-abused provision in the Information Technology Act that allowed police to arrest anyone posting "annoying" or "offensive" content on social media.

The verdict comes as a relief for both social media users as well as India operations of global Internet giants like Google. The latter will no longer be required to take down content after complaints from any party. Only a government or court order can lead to content removal.

The Internet & Mobile Association of India, which counts Google, Microsoft, eBay, IBM, Flipkart, Ola Cabs and LinkedIn as members, said the ruling will encourage more investment in the Internet sector in India.


## What is Section 66A of the IT Act?

Section 66A defines the punishment for sending "offensive" messages through a computer or any other communication device like a mobile phone or a tablet. A conviction can fetch a maximum of three years in jail and a fine.

**Inside this issue:**

## How did the controversy begin?


Shaheen Dhada & Rinu Srinivasan of Palghar were at the centre of the first petition — by Shreya Singhal. When Mumbai saw a shutdown following Bal Thackeray's death in 2012, Shaheen posted on Facebook, "Every day thousands of people die. But still the world moves on… Just due to one politician dead. A natural death. Every one goes crazy… Respect is earned not given out, definitely not forced. Today Mumbai shuts down due to fear not due to respect." Rinu, who "liked" the post, commented: "Everyone know it's done because of fear!!! We agree that he has done a lot of good things. also we respect him, it doesn't make sense to shut down everything! Respect can be shown in many other ways!" Detained for 10 days, they were first charged under IPC for spreading hatred and then under Section 66A of the IT Act. While happy with Tuesday's verdict, Rinu said, "While using digital space, one needs to ensure their actions don't hurt others." Shaheen's uncle A G Dahada said, "The girls went through immense trauma but justice has been done."

***"While using digital space, one needs to ensure their actions don't hurt others." .***

## How frequently has 66A been used?


Most cases of arrest were reported in 2012. Jadavpur University professor Ambikesh Mahapatra was arrested for forwarding caricatures on Trinamool Congress chief Mamata Banerjee on Facebook. Activist Aseem Trivedi was arrested for drawing cartoons lampooning Parliament and the Constitution to depict their ineffectiveness. Air India employee Mayank Sharma and K V Rao from Mumbai were arrested for allegedly posting offensive comments against politicians on their Facebook group.


Businessman Ravi Srinivasan was booked by Puducherry police for an allegedly offensive tweet against the son of a former cabinet minister.

## What are the grounds for the Challenge?


While the objective behind the 2008 amendment was to prevent the misuse of information technology, particularly through social media, Section 66A comes with extremely wide parameters, which allow whimsical interpretations by law enforcement agencies. Most of the terms used in the section have not been specifically defined under the Act. The petitions have argued that it is a potential tool to gag legitimate free speech online, and to curtail freedom of speech and expression guaranteed under the Constitution, going far beyond the ambit of "reasonable restrictions" on that freedom.

The petitions have argued that it is a potential tool to gag legitimate free speech online, and to curtail freedom of speech and expression guaranteed under the Constitution, going far beyond the ambit of "reasonable restrictions" on that freedom.

## What has the court said so far?

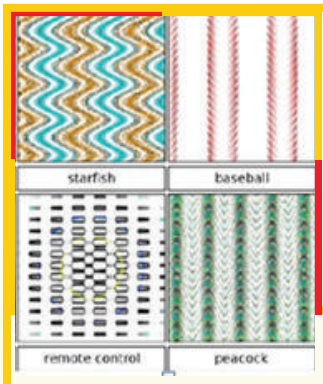
The Supreme Court, in the preliminary hearing, accepted the contention that the provision was "very widely drafted", and gave arbitrary powers to police officers to make arrests. Nudged by the court, the central government issued a set of guidelines in January 2013, intended to prevent misuse of the provision. These guidelines mandated that only senior police personnel could order arrests under this section. The petitioners have, however, maintained that the guidelines could not redeem a provision that was otherwise unconstitutional.

## What happened on Tuesday?

The court gave an ultimatum to the Centre to either clarify its stand on the provisions that envisaged arrest for contentious posts on government failed to file, within a week, a comprehensive affidavit, and explain its final stand on either amending or deleting Section 66A.

**THE BYTE**

**APRIL ,2015**




# Images that make fool, raise security concerns

*Computers are learning to recognize objects with near-human ability. We have found that computers, like humans, can be fooled by optical illusions, which raises security concerns and opens new avenues for research in computer vision.*

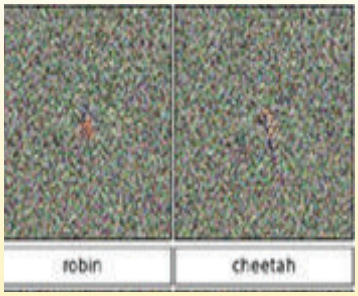
*Some images that look to humans like white noise or random geometric patterns but which computers identify with great confidence as common objects.*

*"First, highlight the extent to which computer vision systems based on modern supervised machine learning may be fooled, which has security implications in many areas. Second, the methods used in the paper provide an important debugging tool to discover exactly which artifacts the networks are learning."*

*Computers can be trained to recognize images by showing them photos of objects along with the name of the object. From many different views of the same object the computer assembles a sort of fuzzy model that fits them all and will match a new image of the same object. In recent years, computer scientists have reached a high level of success in image recognition using systems called Deep Neural Networks (DNN) that simulate the synapses in a human brain by increasing the value of a location in memory each time it is activated. "Deep" networks use several layers of simulated neurons to work at several levels of abstraction: One level recognizes that a picture is of a four-legged animal, another that it's a cat, and another narrows it to "Siamese."*

*But computers don't process images the way humans do. "We realized that the neural nets did not encode knowledge necessary to produce an image of a fire truck, only the knowledge necessary to tell fire trucks apart from other classes". Blobs of color and patterns of lines might be enough. For example, the computer might say "school bus" given just yellow and black stripes, or "computer keyboard" for a repeating array of roughly square shapes.*

*It has been tested with two widely used DNN systems that have been trained on massive image databases. Starting with a random image, they slowly mutated the images, showing each new version to a DNN. If a new image was identified as a particular class with more certainty than the original, the researchers would discard the old version and continue to mutate the new one. Eventually this produced images that were recognized by the DNN with over 99 percent confidence but were not recognizable to human vision.*

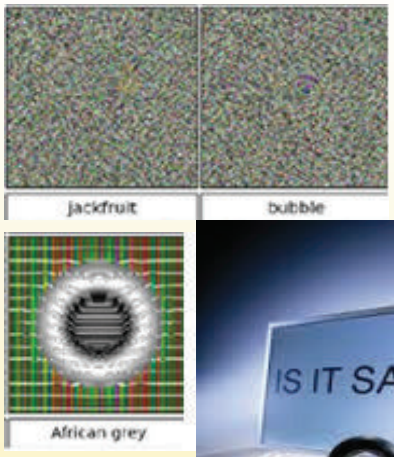



*"The research shows that it is possible to 'fool' a deep learning system so it learns something that is not true but that you want it to learn". "This potentially has the basis for malfeasants to cause automated systems to give carefully crafted wrong answers to certain questions. Many systems on the Web are using deep learning to analyze and draw inferences from large sets of data. DNN might be used by a Web advertiser to decide what ad to show you on Facebook or by an intelligence agency to decide if a particular*

*"Malicious Web pages might include fake images to fool image search engines or bypass "safe search" filters, or an apparently abstract image "*

*"The research shows that it is possible to 'fool' a deep learning system so it learns something that is not true but that you want it to learn"*

*"DNN might be used by a Web advertiser to decide what ad to show you on Facebook or by an intelligence agency to decide if a particular activity is suspicious."*





*activity is suspicious."*

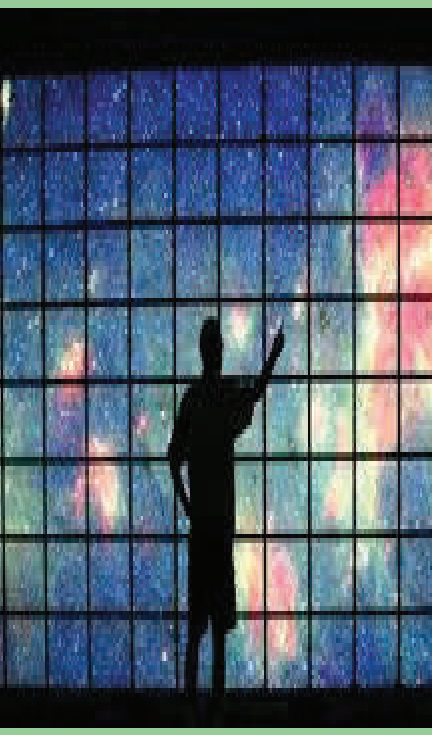
*Malicious Web pages might include fake images to fool image search engines or bypass "safe search" filters, or an apparently abstract image might be accepted by a facial recognition system as an authorized visitor.*

*In a further step, the researchers tried "retraining" the DNN by showing it fooling images and labeling them as such. This produced some improvement, but the researchers said that even these new, retrained networks often could be fooled.*

# Automation offers big solution to big data in astronomy

It's almost a rite of passage in physics and astronomy. Scientists spend years scrounging up money to build a fantastic new instrument. Then, when the long-awaited device finally approaches completion, the panic begins: How will they handle the torrent of data?

That's the situation now, at least, with the Square Kilometer Array (SKA), a radio telescope planned for Africa and Australia that will have an unprecedented ability to deliver data -- lots of data points, with lots of details -- on the location and properties of stars, galaxies and giant clouds of hydrogen gas.



In a study published in The Astronomical Journal, a team of scientists at the University of Wisconsin-Madison has developed a new, faster approach to analyzing all that data.

Hydrogen clouds may seem less flashy than other radio telescope targets, like exploding galaxies. But hydrogen is fundamental to understanding the cosmos, as it is the most common substance in existence and also the "stuff" of stars and galaxies.

As astronomers get ready for SKA, which is expected to be fully operational in the mid-2020s, "there are all these discussions about what we are going to do with the data," says Robert Lindner, who performed the research as a postdoctoral fellow in astronomy and now works as a data scientist in the private sector. "We don't have enough servers to store the data. We don't even have enough electricity to power the servers. And nobody has a clear idea how to process this tidal wave of data so we can make sense out of it."

Lindner worked in the lab of Associate Professor Snezana Stanimirovic, who studies how hydrogen clouds form and morph into stars, in turn shaping the evolution of galaxies like our own Milky Way.

In many respects, the hydrogen data from SKA will resemble the vastly slower stream coming from existing radio telescopes. The smallest unit, or pixel, will store every bit of information about all hydrogen directly behind a tiny square in the sky. At first, it is not clear if that pixel registers one cloud of hydrogen or many -- but answering that question is the basis for knowing the actual location of all that hydrogen.

People are visually oriented and talented in making this interpretation, but interpreting each pixel requires 20 to 30 minutes of concentration using the best existing models and software. So, Lindner asks, how will astronomers interpret hydrogen data from the millions of pixels that SKA will spew? "SKA is so much more sensitive than today's radio telescopes, and so we are making it impossible to do what we have done in the past."

In the new study, Lindner and colleagues present a computational approach that solves the hydrogen location problem with just a second of computer time.

For the study, UW-Madison postdoctoral fellow Carlos Vera-Ciro helped write software that could be trained to interpret the "how many clouds behind the pixel?" problem. The software ran on a high-capacity computer network at UW-Madison called HTCondor. And "graduate student Claire Murray was our 'human,'" Lindner says. "She provided the hand-analysis for comparison."

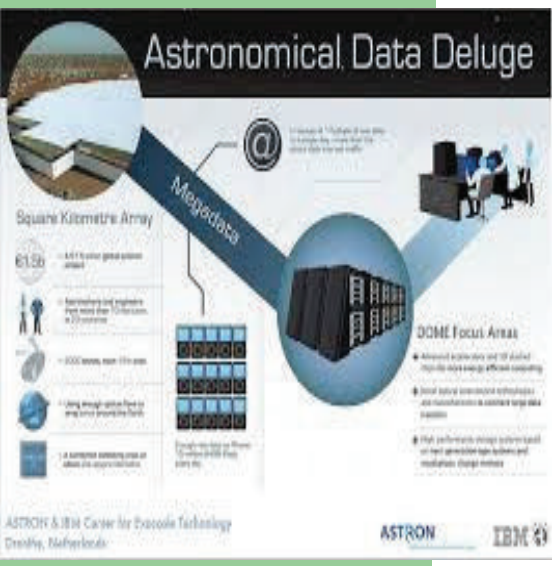
Those comparisons showed that as the new system swallows SKA's data deluge, it will be accurate enough to replace manual processing.

Ultimately, the goal is to explore the formation of stars and galaxies, Lindner says. "We're trying to understand the initial conditions of star formation -- how, where, when do they start? How do you know a star is going to form here and not there?"

To calculate the overall evolution of the universe, cosmolo-

with ongoing star formation, data from the new radio telescopes will support real numbers that can be entered into the cosmological models.

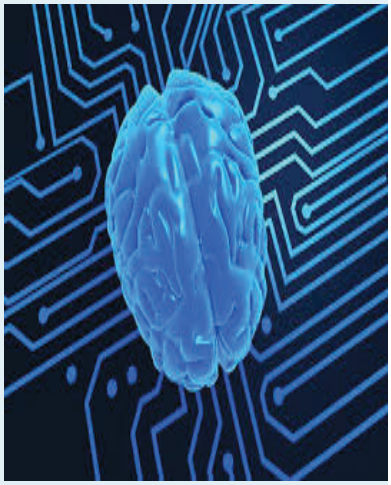
"We are looking at the Milky Way, because that's what we can study in the greatest detail," Lindner says, "but when astronomers study extremely distant parts of the universe, they need to assume certain things about gas and star formation, and the Milky Way is the only place we can get good numbers on that."




With automated data processing, "suddenly we are not time-limited," Lindner says. "Let's take the whole survey from SKA. Even if each pixel is not quite as precise, maybe, as a human calculation, we can do a thousand or a million times more pixels, and so that averages out in our favor.

# Intelligent computers solving the trust equation in difficult negotiations

**SHUBHAM DIXIT**
**CS2 (3rd year)**



Socially intelligent computers can turn difficult online negotiations into win–win situations through tactical information disclosure.

Programming fundamental 'social intelligence' skills into software agents can make humans substantially more trusting of online negotiations, which can lead to superior outcomes in e-commerce transactions, finds an A*STAR-led team of technology researchers, business experts and cognitive scientists.

Automated software agents that bargain for the best deals on the Internet are widely used for business-to-business sales and processes. However, as people are naturally skeptical of negotiations lacking face-to-face contact, engineers are seeking ways to make such software less intimidating.

Yinping Yang from the A*STAR Institute of High Performance Computing explains that it is challenging to create a computerized negotiator with enough social skills to put people at ease. "These agents have to elicit cooperative behavior such as making concessions while maintaining the negotiation goals," says Yang. "This requires transdisciplinary knowledge of business and social communications as well as careful computational coding of social-psychological rules."

Yang and her collaborators from academia and industry realized that one way for computers to gain the trust of human negotiators was to proactively share certain information. For example, the software agent could express that its priority is distribution and offer one price for immediate delivery of merchandise and a lower one for delivery in two weeks -- a flexibility that signals a willingness to search for mutual benefits.

- 80 per cent of the negotiations using the proactive agent were successful
- Even students whose personalities tested positive for cynical, 'Machiavellian' traits felt more trusting about the online negotiations.
- For more information about the team's research, please visit the Social and Cognitive Computing Department webpage.

To test their theory, the team gave 54 MBA students the opportunity to bargain with software designed to simulate the real-world purchasing of laptop computers. They instructed the students to negotiate with an online agent over four key factors -- price per unit, quantity, service level and delivery terms -- while keeping in mind that their top priority should be obtaining a low unit price.

After an initial round of bargaining, the researchers' proactive agent offered to find a joint solution by sharing that if the participant ordered in large quantities, it was willing to make concessions in other areas. The agent then invited the student to reciprocate by divulging their priority. As a control, some students negotiated with a non-proactive agent that simply presented counteroffers without offering additional information.

The results were striking: 80 per cent of the negotiations using the proactive agent were successful, whereas only half of the control group had agreeable outcomes. Surprisingly, even students whose personalities tested positive for cynical, 'Machiavellian' traits felt more trusting about the online negotiations. According to Yang, this finding suggests that even self-interested individuals can be steered toward cooperative approaches with the right social clues.

The A*STAR-affiliated researchers contributing to this research are from the Institute of High Performance Computing. For more information about the team's research, please visit the Social and Cognitive Computing Department webpage.

# THE BYTE

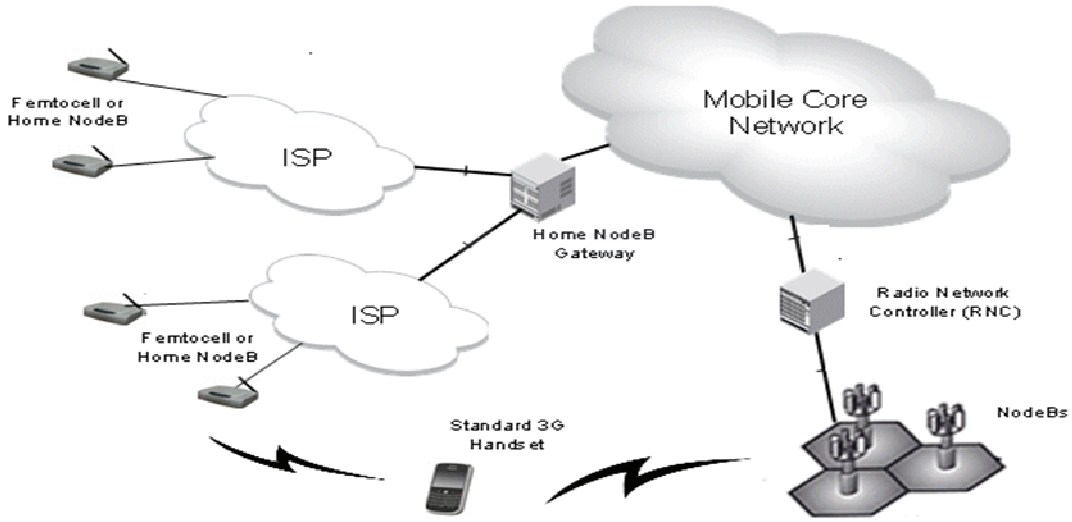
ISSUE VIII , APRIL 2015

# LATEST TECHNOLOGIES

# THE EMERGING TECHNOLOGY- LI FI USING FEMTOCELLS

SWATI SINGH
ASSISTANT PROFESSOR, CSE DEPT.

In the past years, wireless cellular communications has significantly used due to their benefits of reducing the inter-site distance of cellular base stations. By reducing the cell size, the network spectral efficiency has been increased by two orders of magnitude. More recently, heterogeneous networks Are used which comprises of different cell layers composed of microcells, picocells and femtocells.




## THE LI Fi

The concept of Li-Fi is suggested by germen physicist Harald Haas." It is the technique to taking the fibber out of fiber optic by sending data through an LED light bulb that is used to flickers the intensity of light faster than the human eye. "


In this technique a concept of LED and visible light is used for data transmission. The li fi uses VLC for data communications. An LED with Li-Fi technology can be used as a wireless network access point (AP). The Multiple APs each covering a particular area creates cellular network, allowing users to move from one AP to the other without any disturbance in their high-speed data stream. The frequencies of these APs are defined by lighting infrastructure requirements.

## FEMTOCELLS(Home Node B)

Femtocells are used for short range, low transmission power, low operating cost, plug-and-play base stations (BSs) that are used in indoor deployment to enhance coverage. They use either cable Internet or broadband digital subscriber line (DSL) to backhaul to the core network of the operator. The deployment of femtocells increases the frequency reuse, and hence increases throughput per unit area within the system as they usually share the same bandwidth with the macro cellular network. However, random deployment and the uncoordinated mechanism causes additional inter- and intra-cell interference between small cells which imposes a limit on how dense these small RF can be de

ployed before interference starts offsetting all frequency reuse gains .The small cell concept, however, can easily be extended to VLC in order to overcome the high interference generated by the close reuse of radio frequency spectrum in heterogeneous networks.

## Working

The optical Access Point (AP) in Li-Fi is referred to as an attocell. The Li-Flame ceiling unit connects to an LED light to form an atto-cell, which provides communication in the Led Light illuminated area. The Li-Flame system is a combination of various ceiling unit access points and covers a wide area with multiple ceiling unit access points. The system operates in conjunction with the Li-Flame mobile transceiver unit, which features an infrared uplink and connects via a standard USB to the host device to allow full mobility.

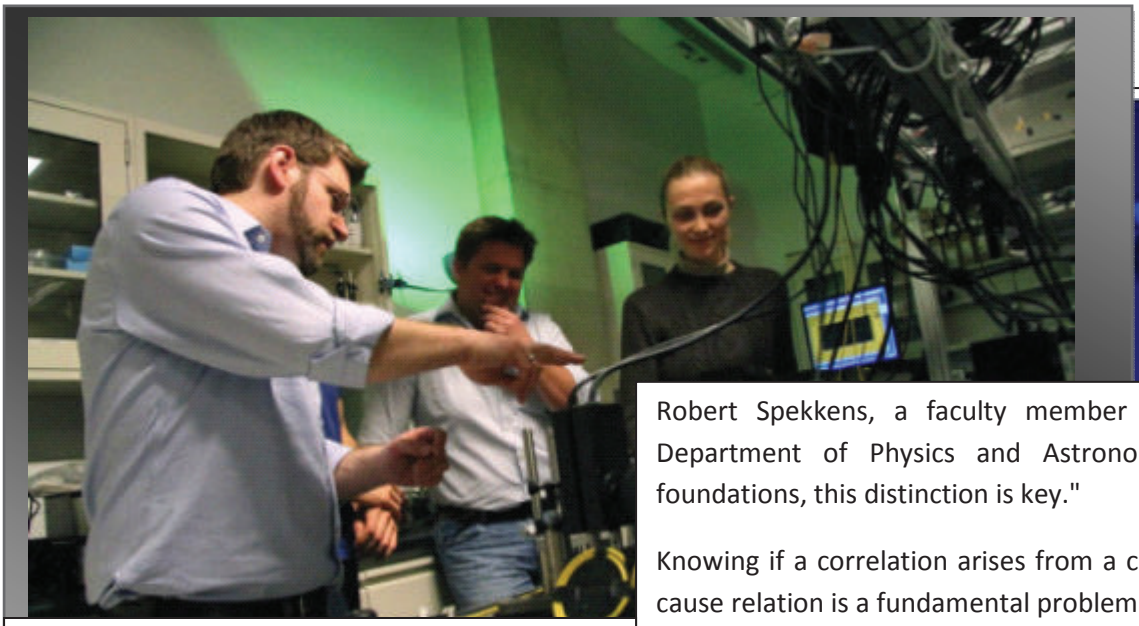
If we equip a room with multiple light and that each light function as a very small radio base station, the result is a network of very small cells that is known as‘optical attocells.

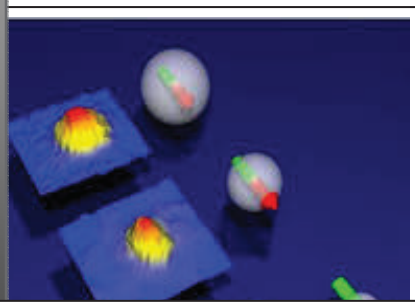
As attocells operates in the visible light spectrum, the optical attocell does not interfere with the macro cellular network. The optical attocell improves indoor coverage, and does not generate any additional interference; it is able to enhance the capacity of the RF wireless networks. Li-Fi attocells allow for extremely dense bandwidth reuse due to the inherent properties of light waves. . The coverage of each single attocell is very limited, and walls prevent the system from suffering from co-channel interference between rooms. This originates the need to deploy multiple access points to cover a given space.

Each attocellular AP results in co-channel interference reduction. This technique allows the cellular coverage area to be broken down further into areas of low interference and areas of high interference – typically at the cell edges. The frequency allocation can then be performed in a more optimal way which allows the overall throughput distribution over the coverage area to increase significantly. A similar concept realized at the receiver side where multiple receiver elements provide a means for enhanced interference mitigation capabilities. This causes each photo detector to scan only a fraction of the available space. The overall combination of all photo detectors provides a result. This discretization of the receiver eyesight allows interference to be avoided by careful recombination of the output signals from each receiver element.

However, due to the requirement for illumination indoors, the infrastructure already exists, and this type of cell deployment results in the very high, practically interference-free bandwidth reuse. The user data rate in attocell networks can be improved by up to three orders of magnitude. Moreover, Li-Fi attocells can be deployed as part of a heterogeneous VLC-RF network. They do not cause any additional interference to RF macro- and picocells, and can, hence, be deployed within RF macro-, pico- and even femtocell environments. This allows the system to vertically hand-off users between the RF and Li-Fi sub-networks, which enables both free user mobility and high data throughput. Such network structure is capable of providing truly ubiquitous wireless network access.

Shubham Dixit ,CS2(3rd year)





# Quantum correlation can imply causation

Contrary to the statistician's slogan, in the quantum world, certain kinds of correlations do imply causation. Research from the Institute for Quantum Computing (IQC) at the University of Waterloo and the Perimeter Institute for Theoretical Physics shows that in quantum mechanics, certain kinds of observations will let you distinguish whether there is a common cause or a cause-effect relation between two variables. The same is not true in classical physics. Explaining the observed correlations among a number of variables in terms of underlying causal mechanisms, known as the problem of 'causal inference', is challenging but experts in field of machine learning have made significant progress in recent years Physicists are now exploring how this problem appears in a quantum context.

Causal inference hinges on the distinction between correlation and causation. "If A and B are correlated, then when you learn about A, you update your knowledge of B -- this is inference. If A causes B, then by manipulating A, you can control B -- this is influence," said Robert Spekkens, a faculty member at Perimeter Institute and the Department of Physics and Astronomy at Waterloo. "In quantum foundations, this distinction is key."

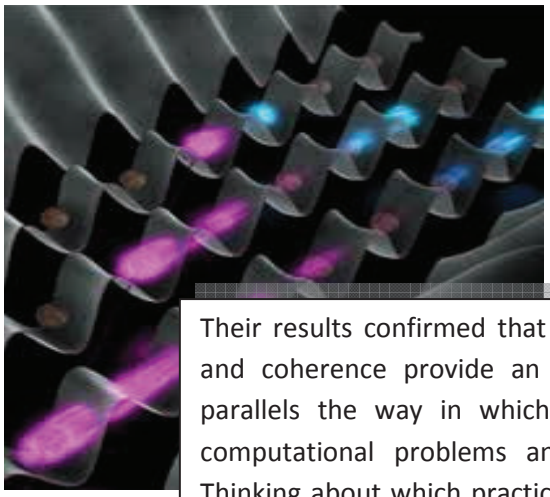
Knowing if a correlation arises from a cause-effect relation or a common cause relation is a fundamental problem in science. A prime example: drug trials. When physicians observe a correlation between treatment and recovery, they cannot presume that the treatment is the cause of the recovery. If men are more likely to choose the treatment and also more likely to recover spontaneously, regardless of treatment, then the correlation would be explained by a common cause.

That is why, when testing treatments, pharmaceutical companies intervene and randomly assign either the drug or a placebo to participants. This ensures that the treatment variable is statistically independent of any potential common causes. This is a general feature of classical statistics: one needs to intervene in order to determine whether the correlations are due to a cause-effect relation, a common cause relation, or a mix of both.

The paper, published today in Nature Physics, demonstrates that quantum effects can eliminate the need for intervention. "This research provides a new way to think about quantum mechanics," said Professor Kevin Resch, Canada Research Chair in Optical Quantum Technologies in the Department of Physics and Astronomy. "It's also a really useful framework for thinking about foundational problems."

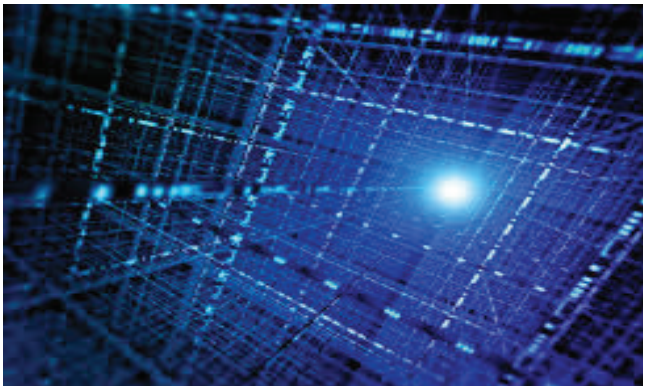
Spekkens, along with PhD student Katja Ried and fellow theorist Dominik Janzing, considered the situation of an observer who is probing two variables and finds them to be correlated. The observer doesn't know whether this is because they are the input and output of a quantum process, that is, cause-effect related, or because they are the two halves of an entangled quantum state, and therefore correlated by a common cause. They realized that certain patterns of correlations are distinctive to each scenario.

Resch, together with his students Megan Agnew and Lydia Vermeyden, had the tools to put this idea to the test. They built a photonic circuit that could switch between the two scenarios proposed by the theorists, allowing them to vary the causal structure realized by the experiment.



Their results confirmed that the quantum effects of entanglement and coherence provide an advantage for causal inference. This parallels the way in which quantum effects can help to solve computational problems and make cryptography more secure. Thinking about which practical tasks are easier in a quantum world has traditionally led to many insights into its foundations.

The team describes their work as opening the door to answering questions such as: How can these techniques be generalized to scenarios involving more than two systems? Is the menu of possible causal relations between quantum systems larger than between classical systems? How should we understand causality in a quantum world?



# OPTICAL FIBERS LIGHT THE WAY FOR BRAIN-LIKE COMPUTING

By : Ms.Vinita
Asst. Proff.
Dept. of CSE

Computers that function like the human brain could soon become a reality thanks to new research using optical fibres made of speciality glass.

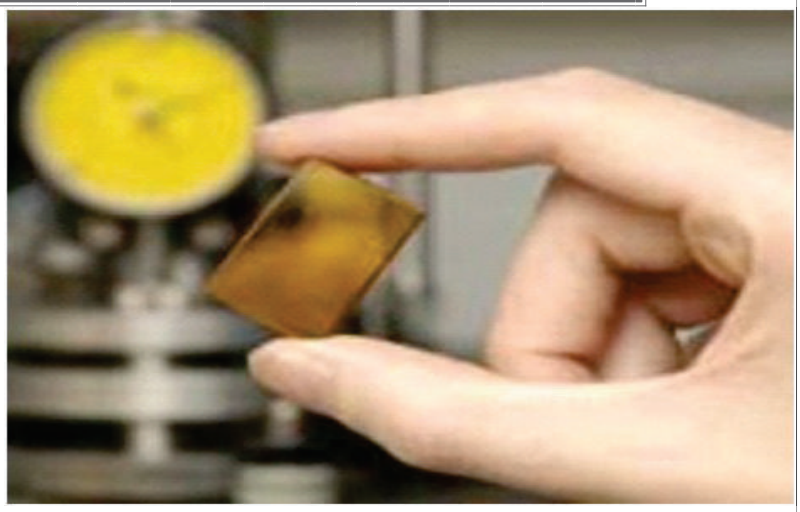
The research, published in Advanced Optical Materials, has the potential to allow faster and smarter optical computers capable of learning and evolving.

Researchers from the Optoelectronics Research Centre (ORC) at the University of Southampton, UK, and Centre for Disruptive Photonic Technologies (CDPT) at the Nanyang Technological University (NTU), Singapore, have demonstrated how neural networks and synapses in the brain can be reproduced, with optical pulses as information carriers, using special fibres made from glasses that are sensitive to light, known as chalcogenides.

"The project, funded under Singapore's Agency for Science, Technology and Research (A*STAR) Advanced Optics in Engineering programme, was conducted within The Photonics Institute (TPI), a recently established dual institute between NTU and the ORC."

Co-author Professor Dan Hewak from the ORC, says: "Since the dawn of the computer age, scientists have sought ways to mimic the behaviour of the human brain, replacing neurons and our nervous system with electronic switches and memory. Now instead of electrons, light and optical fibres also show promise in achieving a brain-like computer. The cognitive functionality of central neurons underlies the adaptable nature and information processing capability of our brains."In the last decade, neuromorphic computing research has advanced software and electronic hardware that mimic brain functions and signal protocols, aimed at improving the efficiency and adaptability of conventional computers.

However, compared to our biological systems, today's computers are more than a million times less efficient. Simulating five seconds of brain activity takes 500 seconds and needs 1.4 MW of power, compared to the small number of calories burned by the human brain.



Using conventional fibre drawing techniques, microfibers can be produced from chalcogenide (glasses based on sulphur) that possess a variety of broadband photoinduced effects, which allow the fibres to be switched on and off. This optical switching or light switching light, can be exploited for a variety of next generation computing applications capable of processing vast amounts of data in a much more energy-efficient manner.

Co-author Dr Behrad Gholipour explains: "By going back to biological systems for inspiration and using mass-manufacturable photonic platforms, such as chalcogenide fibres, we can start to improve the speed and efficiency of conventional computing architectures, while introducing adaptability and learning into the next generation of devices."

By exploiting the material properties of the chalcogenides fibres, the team led by Professor Cesare Soci at NTU have demonstrated a range of optical equivalents of brain functions. These include holding a neural resting state and simulating the changes in electrical activity in a nerve cell as it is stimulated. In the proposed optical version of this brain function, the changing properties of the glass act as the varying electrical activity in a nerve cell, and light provides the stimulus to change these properties. This enables switching of a light signal, which is the equivalent to a nerve cell firing.

The research paves the way for scalable brain-like computing systems that enable 'photonic neurons' with ultrafast signal transmission speeds, higher bandwidth and lower power consumption than their biological and electronic counterparts.

Professor Cesare Soci said: "This work implies that 'cognitive' photonic devices and networks can be effectively used to develop non-Boolean computing and decision-making paradigms that mimic brain functionalities and signal protocols, to overcome bandwidth and power bottlenecks of traditional data processing."

# THE BYTE

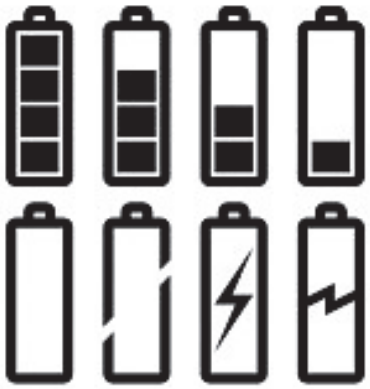
ISSUE VIII , APRIL 2015

## Q & A

# WHAT'S USING UP MY LAPTOP BATTERY?

By : Ms. Hema Kashyap, Asst. Proff. , Dept. of CSE

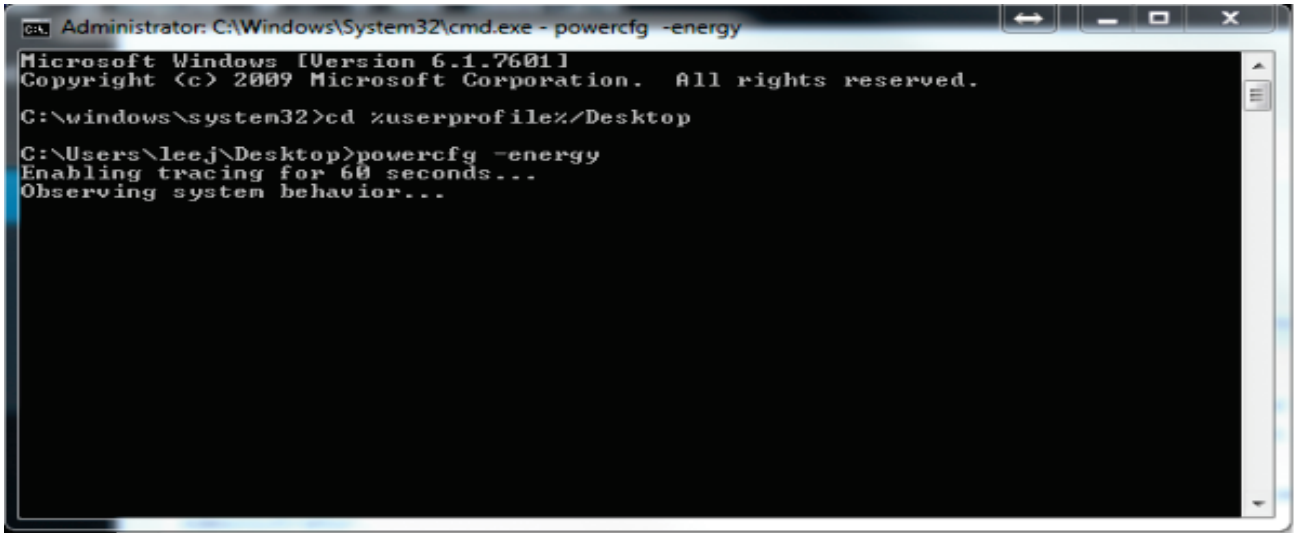
**Q.** Is there a way to check how my laptop is utilizing the battery? I know I have something that must be chewing through most of my charge and I want to figure out what it might be.



**A.** Interestingly enough, there is a built in battery health tool in Windows 7 and Windows 8. It is not very well known and, unfortunately, not very intuitive to use. But if you want to dig into how your laptop is interacting with your battery, this may be the tool for you.

To access it, click Start and type cmd in the search box. This will locate the command prompt icon. When it shows up, right click it and select Run As Administrator.

In the prompt that opens, type ***cd %userprofile%/Desktop*** and press Enter. Then type ***powercfg -energy*** in the command prompt and press Enter.




This will kick off a process that will observe your system behavior for 60 seconds. When it is complete it will create a file called energy-report.html and place it on your desktop.

Now you just need to find the file and double click it. This will open the file in your Web browser. This file has a ton of data about your battery, your power settings and gives insight into what is consuming your battery charge.

As I mentioned, it's not overly intuitive. But it can shed a little light on battery issues if you know how to interpret the data.

# COMPUTER PROGRAMMING: SYSTEM AUTOMATICALLY FINDS COMMON TYPE OF PROGRAMMING BUG

Integer overflows are one of the most common bugs in computer programs -- not only causing programs to crash but, even worse, potentially offering points of attack for malicious hackers. Computer scientists have devised a battery of techniques to identify them, but all have drawbacks.

This month, at the Association for Computing Machinery's International Conference on Architectural Support for Programming Languages and Operating Systems, researchers from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) will present a new algorithm for identifying integer-overflow bugs. The researchers tested the algorithm on five common open-source programs, in which previous analyses had found three bugs. The new algorithm found all three known bugs -- and 11 new ones.

The variables used by computer programs come in a few standard types, such as floating-point numbers, which can contain decimals; characters, like the letters of this sentence; or integers, which are whole numbers. Every time the program creates a new variable, it assigns it a fixed amount of space in memory.

If a program tries to store too large a number at a memory address reserved for an integer, the operating system will simply lop off the bits that don't fit. "It's like a car odometer," says Stelios Sidiroglou-Douskos, a research scientist at CSAIL and first author on the new paper. "You go over a certain number of miles, you go back to zero."
In itself, an integer overflow won't crash a program; in fact, many programmers use integer overflows to perform certain types of computations more efficiently. But if a program tries to do something with an integer that has overflowed, havoc can ensue. Say, for instance, that the integer represents the number of pixels in an image the program is processing. If the program allocates memory to store the image, but its estimate of the image's size is off by several orders of magnitude, the program will crash.

**Charting a course**
Any program can be represented as a flow chart -- or, more technically, a graph, with boxes that represent operations connected by line segments that represent the flow of data between operations. Any given program input will trace a single route through the graph. Prior techniques for finding integer-overflow bugs would start at the top of the graph and begin working through it, operation by operation.

For even a moderately complex program, however, that graph is enormous; exhaustive exploration of the entire thing would be prohibitively time-consuming. "What this means is that you can find a lot of errors in the early input-processing code," says Martin Rinard, an MIT professor of computer science and engineering and a co-author on the new paper. "But you haven't gotten past that part of the code before the whole thing poops out. And then there are all these errors deep in the program, and how do you find them?"

Rinard, Sidiroglou-Douskos, and several other members of Rinard's group -- researchers Eric Lahtinen and Paolo Piselli and graduate students Fan Long, Doekhwan Kim, and Nathan Rittenhouse -- take a different approach. Their system, dubbed DIODE (for Directed Integer Overflow Detection), begins by feeding the program a single sample input. As that input is processed, however -- as it traces a path through the graph -- the system records each of the operations performed on it by adding new terms to what's known as a "symbolic expression.""These symbolic expressions are complicated like crazy," Rinard explains. "They're bubbling up through the very lowest levels of the system into the program. This 32-bit integer has been built up of all these complicated bit-level operations that the lower-level parts of your system do to take this out of your input file and construct those integers for you. So if you look at them, they're pages long."

**Trigger warning:**
When the program reaches a point at which an integer is involved in a potentially dangerous operation -- like a memory allocation -- DIODE records the current state of the symbolic expression. The initial test input won't trigger an overflow, but DIODE can analyze the symbolic expression to calculate an input that will.

The process still isn't over, however: Well-written programs frequently include input checks specifically designed to prevent problems like integer overflows, and the new input, unlike the initial input, might fail those checks. So DIODE seeds the program with its new input, and if it fails such a check, it imposes a new constraint on the symbolic expression and computes a new overflow-triggering input. This process continues until the system either finds an input that can pass the checks but still trigger an overflow, or it concludes that triggering an overflow is impossible.

If DIODE does find a trigger value, it reports it, providing developers with a valuable debugging tool. Indeed, since DIODE doesn't require access to a program's source code but works on its "binary" -- the executable version of the program -- a program's users could run it and then send developers the trigger inputs as graphic evidence that they may have missed security vulnerabilities.

"DIODE provides an effective mechanism for finding dangerous integer overflows that affect memory allocation sites, the source of many critical security vulnerabilities," says Cristian Cadar, a senior lecturer in computing at Imperial College London.


"DIODE is based on symbolic execution, a state-of-the-art technique that provides the ability to automatically explore and analyze paths through a program by modeling these paths as mathematical formulas. In DIODE, symbolic execution is specifically optimized to find integer overflows that affect memory allocation sites, by enhancing it with a novel exploration mechanism that enables it to synthesize dangerous inputs that reach the overflow target. On the practical side, DIODE operates directly on binaries, making it easy to find critical bugs and security vulnerabilities."

# Multiple browsers on your computer can be beneficial

By : Ms. Lipika Goel
Asst . Proff.
Dept. of CSE

**Q.** I decided to try out Firefox so I installed it. I am finding that I don't like it very much. Can I go back to Internet Explorer without too much difficulty?

**A.** When it comes to Web browsers, you can have multiple versions installed at the same time. You can install Firefox, Chrome or even Opera and choose which one you want to use by simply opening it up and using it.

When you install additional Web browsers they don't remove Internet Explorer or any of the other browsers you have installed so can go back and forth, using the browser you want.

It is worth noting that with more than one Web browser installed there can be only one default browser. Whichever browser is the default will be the browser that launches when you click on Web links in email and Web shortcuts you may have saved on your desktop.

If you have recently installed Firefox then it is likely that Firefox has established itself as the default browser. If you launch Internet Explorer it will detect that it is not the default browser and ask you if you would like to make it the default. If it doesn't, it's easy enough to make it the default by setting it in the Default Programs section of the Control Panel.

If you are completely done with Firefox it can be uninstalled, but there is no compelling reason to remove it if you simply don't want to use it. I find having multiple browsers on my computer to be helpful in some situations, especially if one of my browsers is acting up and I need something to access the Web.

# THE BYTE

ISSUE VIII , APRIL 2015

# Departmental Events

# Departmental events



## *International Conference ICACEA-2015*

### *Day 1 of Conference*


DR.R.K KHANDAL ADDRESSING THE AUDIENCE

**2nd International conference** was organized by the department of computer science on 19th—20th March,15 at IMSEC.

The **aim of this conference** was to bring together academic and industrial researchers with shared interests in computer science and its various disciplines.

The inaugural program started with the lightening of the lamp. Distinguished Speakers & Guests from industry and academia , delegates, core committee members of the IEEE Up section and participants from all over India and abroad attended the conference.

Dr. R.K Khandal Vice Chancellor UPTU was invited as the Chief guest for the conference. He declared the conference open.

The delegates and the keynote speaker addressed the audience and delivered their talk.

#### LIST OF DELEGATES ON DAY 1:

- Dr. R. K. Khandal, Vice Chancellor, UPTU
- Dr. S. N. Singh, Professor IIT Kanpur , Member of IEEE Executive Counsel
- Dr. Janice Darbari- Honorary Consul General – Head of Mission for the Republic of Montenegro
- Wassfi Hassan El Sreihin - Secretary General of African-Asian Rural Development Organization
- Dr. Phalguni Gupta, Director NITTTR Kolkata.

### *Day 2 of Conference*

The second day of the conference started with the talk of the keynote speakers.

Eminent guests and delegates from industry and academia attended the conference. Poster presentation competition was also scheduled for the Btech students. Students came up with innovative ideas. The technical sessions with six parallel tracks for paper presentation were conducted successfully.

#### LIST OF DELEGATES ON DAY 2:

- Dr.S.A.M Rizvi ,Jamia Millia Islamia, New Delhi
- Prof.Dr.S Chakraverty , Head of the Computer Engineering Department at Netaji Subhas Institute of Technology
- Mr.Vipul Kocher- Director Indian Testing Board, CoFounder Salt .

# *From the Delegates & Guests...*

**Dr. Janice Darbari:**

- She spoke about the Importance of computers in various fields
- Emphasized on the use of technologies for the betterment of mankind
- Also talked about the combination of technology, science and mind that lead to the new era.
- She appreciated and motivated the students for their efforts and achievements

**Prof. (Dr.) Shampa Chakraverty:**

She talked about the Nature driven heuristics for hardware and software Co-design. Firstly she focuses on the hardware and software co design i.e exploring the design space. She also gave emphasis on learning from nature and solving the computational problems i.e, using Nature driven heuristic.

**Dr. S. N. Singh :**

He talked about how the conference plays important role and helped the researchers in writing the quality research papers.

**Wassfi Hassan:**

- He spoke about rural development through technologies like remote sensing, forecast etc.
- He also talked about innovation, knowledge and best practices

**Dr. S.A.M. Rizvi:**

He talked about the Emerging technology (GRAIN) in India's National Development. His focuses on the future of technology ie, the future of communication, Input/output, and Computing. GRAIN stands for Genetic Engineering, Robotics, Artificial Intelligence, Information Technology and Nano technology.

**Dr. Narendra Kohli :**

He talked about the Individual Green Computing i.e practice of using computing resources efficiently by the individuals or computer users to save energy.

**Prof.(Dr.) R.K Khandal:**

- He talked about the anti-disciplinary studies importance of CSE in various fields.
- He highly appreciated the institute for organizing conference and welcomed the guest and the delegates.

**Prof. (Dr.) Phalguni Gupta:**

- He talked about Latest IT Advancement, Its role and importance in various walks of life also in various other branches/areas.
- His focus was mostly on security, biometrics, pattern recognition and human behavior recognition for authentication.

**Prof. (Dr.) D.P.Vidyarthi :**

He discussed about the Research issues in cloud computing, various projects that are going on also research areas in this field.

**Mr. Vipul Kocher :**

Importance of Software testing and its career opportunities in the testing field.

## List of Other invited guests:

- Dr. Dilip Kr. IEEE Member, GLA Univ. Mathura
- Dr S. S. Bedi, MJPRU, BLY
- Dr. Avadesh Kr. Gupta, IMS, GZB
- Dr. Ekram Khan, IEEE Member, AMU Aligarh
- Dr. D.P Vidyarthi, JNU, Delhi
- Dr. Muneesh Trivedi, IEEE Member, ABES, GZB
- Prof. R. K. Kapur, Amity. Gr. Noida
- Mr. Mohnesh Kumar, Manager-ITB

# *GLIMPSES OF ICACEA'15*





# THE BYTE

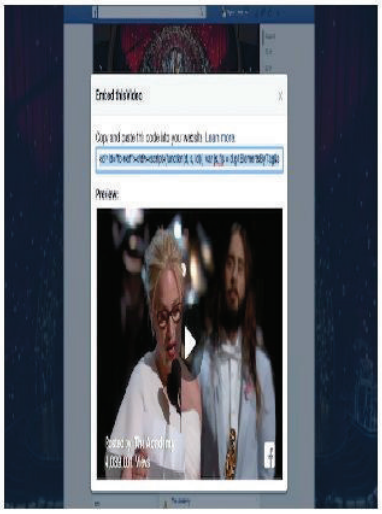
ISSUE VIII , APRIL 2015

# Current Affairs

# Current News

Anuj Srivastava
3rd year , cs-1

## THE WORLD



### Facebook Will Now Let You Embed Facebook Videos On Other Sites

Facebook wants to be your source for everything — whether or not you're actually on Facebook.

Today at F8, Facebook introduced the ability to embed Facebook videos on other websites.

While you've been able to upload your videos to Facebook for ages, embedding them anywhere else was a bit of a pain. You could tear through the video player's source code and try to get something working — but in most cases, it was easier to just turn to YouTube.

### Flipkart aims to generate 20 lakh jobs in 2015

NEW DELHI: Domestic eCommerce major Flipkart today said it will generate over 20 lakh jobs through its marketplace and ancillary services this year.

The Bangalore-based firm expects 60 per cent of this employment to be generated in the logistics and warehousing sector.


### Bharti Airtel, Reliance Communications gain capability for 4G service across country

NEW DELHI: Bharti AirtelBSE -5.64 % and Reliance CommunicationsBSE -3.56 % (RCom) have gained capability to provide 4G services across the country as they bagged requisite spectrum in the concluded spectrum auction.

RIL's telecom arm Reliance Jio already has pan-India 4G spectrum.

## Apple plans China iPhone trade-in program with Foxconn: Report

Apple Inc plans to introduce a trade-in program for iPhones in China in association with the Foxconn Technology Group, Bloomberg reported, citing people familiar with the effort.

Under the program, consumers will be able to exchange older iPhones at Apple stores in China for credit against the company's products starting March 31, Bloomberg reported.

## AAP draws flak, ridicule over infighting

NEW DELHI: AAP today drew flak over the infighting from other parties which asked it to put its house in order and focus on delivering on its election promises made to the people of Delhi.

Congress spokesperson Abhishek Manu Singhvi said it is the people of Delhi who are suffering the most due to the AAP's internal turmoil.

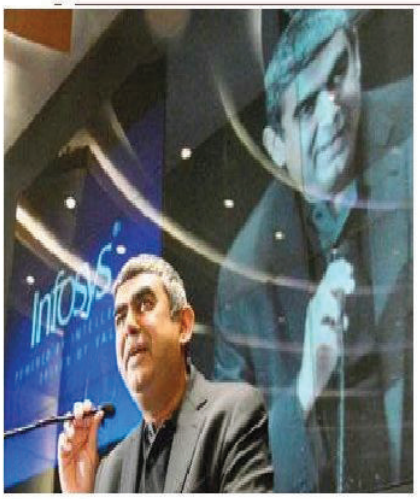
## Kolkata Outpaces Other Metros In Construction Of New Homes, new units up 122% in 2014

KOLKATA: The City of Joy outpaced other metros in commencing construction of new homes in the fiscal year that is coming to an end. In Kolkata, construction of as many as 17,300 units started in the year that began in April 2014, a 122% increase over the previous year, showed a Cushman & Wakefield report. That was more than that in cities like Chennai, Bengaluru, Delhi-NCR and Ahmedabad.


## Oracle vying to augment cloud strategy in India to tap into the rapidly growing market

BENGALURU: Oracle is augmenting its cloud strategy in India to tap into the rapidly growing market by hiring more than 300 sales executives and through new partnerships.

"In the past 8-9 months, our cloud business in India has seen phenomenal growth. We expect this to continue quarter-over-quarter," Oracle India's newly appointed managing director, Shailender Kumar, told ET.




## Infosys rolls out average salary increment of 6.5%, dampening staff sentiment

BENGALURU/NEW DELHI: InfosysBSE 2.68 % announced its lowest average wage increase in five years late on Thursday, causing widespread dampening of sentiment among employees and portending anaemic pay-raises for workers in India's $146-billion information technology industry.


## New goldmine of big data: CFOs should lead mining operations

Over the years, information technology systems in an organisation have come closer and closer to having a marked impact on a business' bottomline by enabling operating efficiencies. The internal IT function has also empowered business planning and strategic thinking, and contributed to a healthier topline. However, Big Data empowers CFOs as never before to leverage IT to make strategic business decisions.

## Yahoo, Microsoft extend search partnership talks for 30 days


SAN FRANCISCO: Yahoo Inc and Microsoft Corp agreed to extend by 30 days the deadline to re-negotiate a ten year search deal, as the two Internet companies attempt to revamp a thorny partnership crafted by former chief executives.

## India Open Semis: Saina Nehwal Celebrates World No. 1 Rank with Crushing Win vs Hashimoto


Crowned the world number one, Saina Nehwal today celebrated her numero uno status with a straight-game demolition of Japanese Yui Hashimoto to reach her maiden final of the USD 275,000 India Open Super Series at the Siri Fort Sports Complex here on Saturday.

## Cricket World Cup 2015: Australia crush New Zealand in final


New Zealand lost influential captain Brendon McCullum to the fifth ball of the match and were bowled out for 183.
Grant Elliott resisted with 83, while Mitchell Starc, Mitchell Johnson and James Faulkner shared eight wickets.
Play media
Jump media playerMedia player helpOut of media player. Press enter to return or tab to continue.
Cricket World Cup 2015: Australia beat New Zealand in Melbourne final
Australia rarely looked troubled, sealing a seven-wicket win in 33.1 overs, with captain Michael Clarke scoring 74 and Steve Smith 56 not out.

# THE BYTE

ISSUE VIII , APRIL 2015

## Placement News

SAPNA YADAV,ASST PROF, CSE

# PLACEMENT NEWS

## DRDO (RAC) JOBS FOR SCIENTIST IN DELHI

DRDO dedicatedly working towards enhancing self-reliance in Defence Systems and undertakes design & development leading to production of world class weapon systems and equipment in accordance with the expressed needs and the qualitative requirements laid down by the three services.

Eligibility : BE/B.Tech (Aero, CSE, ECE, Mechanical Engineering, Electrical)

Location : Delhi

Last Date : 10 Apr 2015

Job Type : Full Time

Pay Scale : Rs.15,600-39,100

Age Limits :

(as on closing date of advertisement): (a) OBC (Non-creamy layer) : Not exceeding 31 years (b) SC/ST : Not exceeding 33 years

Application Fee :

Application Fee of Rs. 50/- (fifty) shall be paid online. No fee is payable by SC/ ST/ PH (with minimum 40% disability) / Women candidates.

## Selection :

Candidates will be short-listed for personal interview on the basis of the information provided by them in their online applications. Candidates must ensure that information provided by them is true. If at the time of interview or at any subsequent stage, any information given by them or any claim made by them in their online applications is found to be false, their candidature will be liable to be rejected and they may also be debarred either permanently or for a specified period from appearing in any future examination or selection activity conducted by RAC.

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LOOK UP INSIDE

## CENTRE DEVELOPMENT OF ADVANCED COMPUTING (C-DAC) JOBS FOR TECHNICAL OFFICER/ ENGINEER

Centre for Development of Advanced Computing (C-DAC) is the premier R&D organization of the Department of Electronics and Information Technology (DeitY), Ministry of Communications & Information Technology (MCIT) for carrying out R&D in IT, Electronics and associated areas. Different areas of C-DAC, had originated at different times, many of which came out as a result of identification of opportunities.

- Eligibility : ME/ M.Tech, MSc, MCA, BE/B.Tech
- Last Date : 06 Apr 2015
- Pay Scale : 15600-39100
- Age : 30 Yrs

## RESERVE BANK OFFICERS' GRADE `A' / `B' EXAM

This examination is held every year generally in the month of December by the Reserve Bank of India Services Board, Hong Kong Bank Building, 6th Floor, Mahatma Gandhi Road, Hutatma Chowk, Post Box No. 10009, Mumbai-400001. The advertisement for the examination is published in the Employment News generally in the month of July each year. The last date for submission of applications is generally 3rd week of August.

The Reserve Bank of India Services Selection Board holds the examination in two phases. First Phase-Paper I (Objective Type) of three hours duration is held in the month of December. Second Phase (Descriptive Type) is conducted generally in the month of May in respect of those candidates who are successful' in Objective Type examination (Separately for each test) on the basis of standard prescribed by the Board. It consists of Paper II and Paper III.

**Educational qualifications:**

A First Class Bachelor's Degree from a recognized University with a minimum 60% marks or equivalent grade.
Or
A Second Class Master's Degree from a recognized University with a minimum of 55% marks or equivalent grade.
Or
A Doctorate Degree with 50% marks in Master's Degree or equivalent grade.
Or
A Chartered/Cost Accountant with a Bachelor's Degree.
Or
A Post-Graduate diploma in Management from IIM-Ahmedabad, Bangalore or Calcutta, with a Bachelor's Degree.

**Age Limits:**

21 to 26 years on the 1st July of the year of examination on the basis of Bachelor's Degree.

21 to 28 years on 1st July of the year of examination for candidates applying on the basis of Master's Degree.

The upper age limit is relaxed in respect of the Scheduled Castes, Scheduled Tribes and Other Backward Classes and such other categories of persons as may from time to time be notified in this behalf by the Government of India to the extent and subject to the conditions notified in respect of each category.

**Plan of the Examination:**

| Grade 'A' Officers | | | |
|---|---|---|---|
| **Paper** | **Subject** | **Duration** | **Max. Marks** |
| Phase I | ... | ... | ... |
| I | Object Type Test Consisting of : General Awareness, English Language, Quantitative Aptitude, Reasoning. | 3 hours | 200 |
| | ... | ... | ... |
| Phase II | ... | ... | ... |
| II | English (Essay, Precise Writing/ Comprehension, Business/Office Correspondence) | 2.5 hours | 100 |
| ... | ... | ... | ... |
| III | Economic and Social Problems | 2.5 hours | 100 |
| Grade 'B' Officer Papers | | | |
| Phase I | ... | ... | ... |
| I | Objective Type Test consisting of: General Awareness, English Language, Quantitative Aptitude, Reasoning | 3 hours | 200 |
| ... | ... | ... | ... |
| Phase II | ... | ... | ... |
| II | English [Essay, Precise Writing/Comprehension, | 3 hours | 100 |

## STATE BANK OF INDIA PROBATIONARY OFFICERS' EXAM

This examination is held every year by the Central Recruitment Board, State Bank Group, generally in the month of July. Blank application forms and other particulars are published in the Employment News in the month of March. The last date for submission of applications is generally second week of April.

**Educational Qualifications:**

Degree from a recognized University or any equivalent examination recognized as such by the Government of India.

**Number of Chances:**

No candidate is permitted to compete more than three times at the examination. This restriction will not apply in the case of candidates belonging to SC/ST/ OBC communities provided that they are otherwise eligible.

**Age:**

A candidate for this examination should have attained the age of 2 1 years and must not have attained the age of 28 years on the 1st January of the year: of examination. The age is relaxable for Scheduled Castes, Scheduled Tribes and Other Backward Classes, etc.

**Plan of the Examination:**

The subjects of written test the time allowed and the maximum marks allowed to each subject shall be as under:

| Tests | No. of Questions | Maximum Marks | Time Allowed |
|---|---|---|---|
| (A) | ... | ... | ... |
| Objective Tests | ... | ... | ... |
| ... | ... | ... | ... |
| 1. Reasoning | 75 | 80 | ... |
| 2. English Language | 50 | 50 | |
| 3. General Awareness | 50 | 60 | |
| 4. Quantitative Aptitude | 50 | 60 | |
| ... | ---- | ---- | ... |
| ... | 225 | 200 | ... |
| ... | ---- | ---- | ... |
| (B) | ... | ... | ... |
| ... | ... | ... | ... |
| Descriptive Paper | ... | ... | ... |
| ... | ... | ... | ... |
| Argumentative Questions | 4 | 60 | 45 Minutes |

## NATIONALISED BANKS PROBATIONARY OFFICERS' EXAM

Banking Service Recruitment Boards` are located at New Delhi, Chennai, Calcutta, Bangalore, Chandigarh, Lucknow, Guwahati, Baroda, Jaipur, etc. These invite applications for appointment as Probationary Officers', etc., in the nationalized banks in their respective regions.

**Educational Qualifications:**

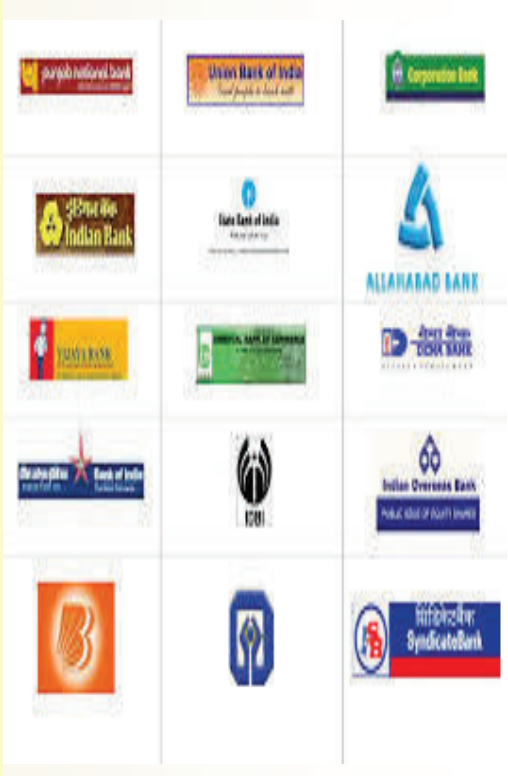
Degree of a recognized University or equivalent qualification recognized as such by the Government of India.

Age Limits:

Not below 21 years and not above 28 years. The limit is relaxable in respect of candidates belonging to SC/ST/OBC and other categories .

**Plan of Examination:**

Same as for State Bank Prob. Officers' Exam.



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