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CSI Communications

Knowledge Digest for IT Community

INTELLIGENT SYSTEMS

CSI Elections 2013-2014/2015

Following is the final slate by the Nominations Committee (2012-2013) for the various offices of the Computer Society of India for 2013-2014/2015.

For the Term 2013-2014 (April 1, 2013 - March 31, 2014)

Vice President cum President Elect

- Prof. D B V Sarma
- Mr. H R Mohan
- Prof. P S Grover
- Prof. R K Shyamasundar
- Mr. Shrikant R Karode

National Nomination Committee

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- Prof. H R Vishwakarma
- Mr. Lalit K Sawhney
- Prof. N Prasanna Balaji
- Prof. P S Avadhani
- Dr. Rattan K Datta
- Dr. Shashikant Anand Kelkar
- Mr. Sibsankar Daspal
- Mr. Vijay Rastogi
- Mr. V L Mehta

For the Term 2013-2015 (April 1, 2013 - March 31, 2015)

Hon. Treasurer

- Mr. Devesh Kumar Dwivedi
- Mr. M P Goel
- Mr. Ranga Rajagopal

Regional Vice President (Region I)

- Mr. Anil Srivastava
- Dr. Brijendra Singh
- Mr. R K Vyas

Regional Vice President (Region III)

- Mr. Azimuddin Khan
- Prof. R P Soni
- Mr. V P Saxena

Regional Vice President (Region V)

- Mr. Lakshminarayan Raju Kanchibotla
- Dr. Swarnalatha R Rao

Regional Vice President (Region VII)

- Mr. Soman S P

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- Dr. Vishnu Kanhere

Divisional Chair Person Div. III (Applications)

- Prof. A K Nayak
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Divisional Chair Person Div. V (Education & Research)

- Dr. Anirban Basu
- Prof. Durgesh Kumar Mishra
- Dr. Gautam Shroff
- Dr. P Sakthivel
- Prof. Shirish Shrikrishna Sane

Appeal to Members

You may be aware that the election for the various positions of the Executive Committee and three members of the Nomination Committee for the term 2013-14/2015, as the case may be, will be internet based during this year, as in the past. You will be exercising your voting rights through electronic ballot.

To exercise your ballot you are requested to login to http://www.directvote.net/csi using your CSI Membership Number and password. (Please ensure putting leading zeros before your Membership Number). Please view your Region and Balloting options for the elective offices for the term 2013-14/2015.

Please communicate your valid email ids to CSI HQ for receiving your log in details, if there is any change.

In case you have not received your password, please write to helpdesk@csi-india.org on or before January 10, 2013 and your request will be forwarded to Survey & Ballots Systems which will e-mail your login password.

Please note that you exercise your vote for the posts of Vice President cum President elect, Nomination Committee (3 members), Hon. Treasurer, RVP I, RVP III, RVP V, RVP VII and Chairmen for Div., I, Div., III, and Divi., V. In case of RVPs, membership belonging to a particular region would only vote for that region's RVP.

The ballot also includes some amendments to the constitution (proposed by ExecCom) to be approved. You are requested to exercise your voting for these also.

The balloting for this election will start on 15th Dec., 2012, at 18 hrs (IST) and will end at 18.00 hrs (IST) on Tuesday 16th Jan., 2013. You are requested to exercise your voting right electronically before the closure of the election site. If you have any queries on internet balloting, please email to support@directvote.net for clarifications.

Thanking you and with season' greetings

Dr. D D Sarma

Nominations Committee 2012-2013

Dr. D D Sarma
(Chairman)

Bipin V Mehta
(Member)

Subimal Kundu
(Member)

CSI Communications
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* Access is for CSI members only.

Important Contact Details »

For queries, correspondence regarding Membership, contact helpdesk@csi-india.org

President's Message

Satish Babu

From : president@csi-india.org
Subject : President's Desk
Date : 1st December, 2012

Dear Members

I compose this message at Kolkata, where CSI has just concluded yet another successful Annual Convention. The Convention was a truly momentous occasion, and the splendid organizational efforts of CSI Kolkata Chapter team was evident in the painstaking planning that went into it. The event was further enriched by the different awards that CSI presents annually in recognition of eminent and distinguished contributions of both internal and external stakeholders, including the Lifetime Achievement Awards, Fellowships, CSI Patron Award, IT Excellence Awards, Service Awards, and Educational Awards. The event also saw several of the CSI internal meetings including the Annual General Meeting of the Society.

I wish to congratulate the Kolkata Chapter leadership for an excellent CSI Annual Convention, as well as for the well-conducted technical conference, Emerging Applications of Information Technology (EAIT 2012) held at ISI, Kolkata, during 30 Nov-1 Dec 2012. It is particularly noteworthy that Kolkata is historic in the annals of CSI as the first CSI Annual Convention was convened in 1965 at ISI.

I also wish to felicitate the winners of awards as well as the Conveners and team members of the different awards who have been working extremely hard for the last several weeks to complete the process.

As always, the Annual Convention of CSI is an occasion for celebration; but it is also an occasion for introspection. The feedback from the different meetings—in particular from the AGM, National Council, President's Council, and Think Tank—gives us room to explore opportunities for improvements in our structure and function, and gives us the impetus to consider re-engineering some of our own processes. I am enumerating below a few of the suggestions that came up in these meetings as well as during informal interactions with a number of members.

An important item that came up repeatedly was the need to better define the value proposition for CSI members, in particular for student members, given that they formed a large proportion of CSI members. There was consensus that even though we have enhanced our student services significantly, there is perhaps still scope for improvement. Not only was there a need for student member services to be better streamlined, and with tighter SLAs, but there was also a need for CSI to respond to some of the academic challenges. A student track in prominent CSI conferences was suggested as one way to add value for students. It was also pointed out that CSI could consider interventions in school-levels through initiatives such as computer clubs in addition to current programs such as SEARCC and quiz contests.

Another important suggestion that came up was the need for CSI to engage with external organizations and networks and derive benefits for its members from them. These included several categories of institutions—traditional partners such as IFIP, SEARCC, ACS or BCS; international fraternities such as IEEE & IEEE Computer Society and ACM; and new-generation organizations in the Internet Governance space such as BASIS and ICANN. It was pointed out engaging with these institutions

would require the help of dedicated CSI volunteers and also additional flexibility on the side of CSI, but the rewards could be significant, especially for the academic & research communities among CSI members.

Another recurring suggestion related to engaging with corporates and large companies. It was felt that CSI could better engage with corporates in different ways, with bulk membership schemes and corporate social responsibility being the most-quoted dimensions. Better linkages with Indian diaspora in different regions around the world was also highlighted as a need.

Finally, working with the State and Central Governments was considered very important by several of the stakeholders. Co-operating in technical programs with the Government not only would contribute to nation-building but also provide for optimal use of the technical skills of CSI's members, and fetch revenues to CSI.

These and the other suggestions made in various fora at the Annual Convention are valuable inputs to us to consider for the future. The ExeCom will consider these in its future meetings. I am also placing them before the members of CSI so that you may provide your comments and suggestions on them.

December is important to CSI for another reason as well. This is the usual time for the elections to the CSI ExeCom positions. The Nominations Committee of 2012-13 has finalized the slate well on time, and further information on elections would reach members shortly. I would also like to mention that this time, there would be voting also on the by-law amendments that finalized and handed over to the current ExeCom from the previous ExeCom during the joint meeting on 31 March, 2012. I am thankful to the Nominations Committee for their timely and effective work in these last few weeks.

As in any democratic institution, voting is crucial to sustaining CSI's vibrancy. I request all members to exercise your voting rights and elect candidates of your choice.

With greetings

Satish Babu
President

Editorial

Rajendra M Sonar, Achuthsankar S Nair, Debasish Jana and Jayshree Dhere
Editors

Dear Fellow CSI Members,

Welcome to CSI Communications – Knowledge Digest for IT Community December 2012 issue. In this issue we cover the theme: intelligent systems. Intelligent systems have been playing crucial role in many domains. The focus is on building machines or models that mimic or simulate intelligence especially human intelligence. Many intelligent system applications date back to more than four decades starting with expert system applications such as MYCIN. Since then they have been increasingly playing a role in implementing knowledge management systems, business intelligence and analytics systems, intelligent decision support systems, filtering techniques and so on.

Many intelligent system applications date back to more than four decades starting with expert system applications such as MYCIN. Since then they have been increasingly playing a role in implementing knowledge management systems, business intelligence and analytics systems, intelligent decision support systems, filtering techniques and so on.

We begin this issue with cover story titled *'Intelligent Systems: Perspectives and Research Challenges'* by Prof. Rajendra Akerkar, Western Norway Research Institute, Norway. He writes to exhibit autonomous intelligent behavior of a machine that must be capable of performing three fundamental functions: Perception, Cognition, and Execution and defines what should be the characteristics of intelligent behavior. He also mentions about research trends: interactive intelligent agents, bio-inspired systems, intelligent simulation systems, biological processes and emergence, intelligent decision support and present day research challenges.

Personalization on web used to be a luxury of few eCommerce players earlier but increasingly it is becoming a 'must-have' feature of many websites. It is not only limited to web but is now becoming a part of many other applications such as mobile VAS (value-added services). In Tech Trends, Prof. J Jerald Inico and Dr. T Edwin Prabakaran, Dept of CS, Loyola College, Chennai talk about the key challenges, evolution and various types of filtering techniques used for web personalization.

Conventional education has been one-to-many and has limited reach, and most of the time it cannot be as effective as one-to-one personalized instructions! With the advent of content management and eLearning systems, it is possible to have personalized education with greater reach. Dr. Sasikumar, Director (R&D), C-DAC writes about Role of Artificial Intelligence in Enhancing the Effectiveness of Education. He emphasizes on some challenges involved and informs about the interesting R&D area from both education perspective as well as from the technology perspective.

Conventional education has been one-to-many and has limited reach, and most of the time it cannot be as effective as one-to-one personalized instructions! With the advent of content management and eLearning systems, it is possible to have personalized education with greater reach.

In article section, we present three articles first is on Cloud-based mobile solutions from regular CSI-C contributor Prof. Prerna Lal of International Management Institute, New Delhi. The second one is by Prof. Baisa L Gunjal (Amrutvahini College of Engineering Sangamner) and Dr. Suresh N Mali (Principal, Singhgad Institute of Technology and Science) on Image Processing with Matlab, Scilab, and Octave. The third article in the article section is titled 'Convert Postman to Infoman' and is written by James Joseph, founder of Professional Bharati - a social networking platform for Indian Professionals.

In Practitioner Workbench section we have two sections. First section *Programming.Tips()* comes with an article titled 'AWK Basic' and is written by Prof. Jitendra Singh Kushwah, School of Computer Application, ITM University. The second one *Programming.Learn("Python")* has an article on 'Image Processing in Python' by Prof. Umesh P, Department of Computational Biology and Bioinformatics, University of Kerala.

Managing IT in the rapidly changing environment needs extensive expertise and has to deal with various issues ranging from procuring right software to supporting and maintaining IT setups and infrastructure. Intelligent systems have greater role to play in managing IT. Dr. Sonar writes about intelligent systems and their applications in managing IT.

Managing IT in the rapidly changing environment needs extensive expertise and has to deal with various issues ranging from procuring right software to supporting and maintaining IT setups and infrastructure. Intelligent systems have greater role to play in managing IT.

Security Corner column has two sections one on Information Security and the other on IT Act 2000. The first section is enriched with an article on "Social Networking Sites - Risks to Organizations" by Adv Prashant Mali, Cyber Security & Cyber Law Expert. In the second section, we have an article written by Adv Subramaniam Vutha in the form a dialogue between professor of IT Law and an IT executive, and here this time he covers AIR (Authenticity, Integrity and non-Repudiation) in e-Commerce.

In IT.Yesterday(), N Krishnaswamy, IPS (Retd.), Chairman, Vidya Vrikshah takes the readers back in late sixties and seventies through his article on "Computers in the Indian Police".

There are other regular features such as Brain Teaser, Ask an Expert and ICT News Brief in November 2012 in Happening@ICT and CSI reports, chapter and student branch news, CSI reports and various calls.

Remember we look forward to receiving your feedback, contributions and replies as usual at csic@csi-india.org.

With warm regards,

Rajendra M Sonar, Achuthsankar S Nair,
Debasish Jana and Jayshree Dhere
Editors

Cover Story

Rajendra Akerkar
Professor, Western Norway Research Institute, Norway

Intelligent Systems: Perspectives and Research Challenges

Introduction

The human brain is an incredible system. It is a very sophisticated processing unit - the brain - which can perform some amazing tasks. The brain lets us to accomplish several complex tasks, such as recognizing individuals we know, performing hard computations, and making critical decisions based on experiences. In spite of their speed and memory capacity, today's computers struggle to emulate human brain - still computers lack the ability to perceive, reason, and learn as well as we do. The branch of computer science known as Artificial Intelligence (AI) tries to narrow the gap.

AI has been focusing on narrowing the gap between human brains and computers by endeavoring to develop machines with the ability to act intelligently. Sometimes, the brain does not do the action immediately but uses its imagination. It selects a response rule and determines what situation results from the action. Then it selects again an action for this new situation and determines the probable result. Thus it can choose not only one response rule but a complete plan of action. This allows us to create *intelligent systems,* which operate autonomously, interact naturally with their environment and the humans therein, and be adaptive to changing situations and contexts, including the user's preferences and needs. Examples of such intelligent systems in operation today include mobile devices that can translate and interpret foreign languages, a social emotional *bot* as an edutainment tool, systems that supports the selection, configuration, and operation of strategies and tools in the bioinformatics, and machines that can automatically analyze medical images such as CAT scans to discover tumors or bone fractures. However, popular attempts in creating intelligent systems are still largely restricted to systems designed for environments having limited scope and performing simple tasks. In the future, research efforts must be devoted to intense *cognitive* challenges which are measurable and scalable in open-ended scenarios under changing conditions.

Intelligence

We define *intelligence*[1] as the competence of a system to achieve a target or sustain desired behavior under conditions of uncertainty. Our definition is fundamentally based on the phenomenon of intelligence in biological systems where, one can say that intelligence helps them to deal with unpredictable changes in the environment.

Intelligent behavior is demonstrated by artefacts and biological systems capable of achieving definite goals or sustaining anticipated behavior under conditions of uncertainty even in feebly structured environments, for instance, a situation where an mobile robot must distinguish between a person and an equipment at a workplace in which it operates.

Intelligent behavior can be characterized by clearly identifiable features as shown in the Table 1.

Let us try to understand some of the ways AI scientists and engineers have organized their programs to achieve intelligent behavior. Some of them were inspired mainly by engineering and computational considerations and some by cognitive science in its attempt to model psychological data. Some were even influenced by ideas about how various brain regions function. Parallel operation is assumed in many of these architectures, even though it is often of the simulated variety.

Three Basic Functions

To exhibit autonomous intelligent behavior a machine must be capable of performing three fundamental functions named in as: Perception, Cognition, and Execution (see Fig. 1).

The *perception function* provides information about the actual state of the system and its environment. The perception collects data about the world in which the system operates and processes collected data with a view to gathering reliable information to take decisions on future system behavior.

The *cognition function* consists in planning an initiating the system's actions while taking into account information provided by perception.

The *execution function* has the role of initiating, controlling, handling, and terminating the system's actions, based on instructions received from cognition and perception systems.

Obviously there are many promising ways of organizing these functions to achieve autonomous intelligent behavior. Conceptually the most simple

Feature	Capability
Adaptability	To achieve specified goals or sustaining desired behavior in an environment characterized by unpredictable external changes
Self-maintenance	To maintain its own state of operational readiness
Communication	To exchange information with other systems
Autonomy	To act independently from other systems, including human operators
Learning	Being trained to carry out certain tasks
Self-improvement	To improve its own future performance based on past performance combined with learning from other agents or human operators
Anticipation	To predict changes in its environment which may affect its operation
Goal-seeking	To formulate and modifying tactical sub-goals with a view to achieving planned goals
Creativity	To generate new useful concepts, theories, testing methods, and methodologies
Replication	To create replicas of itself

Table 1: Intelligent behavior characterization

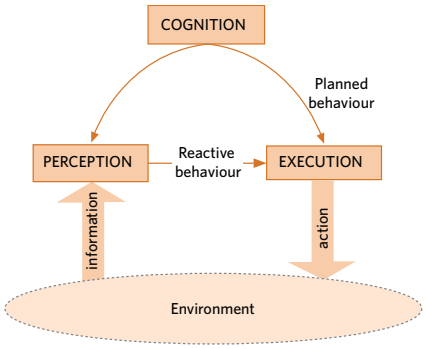

Fig. 1: Functions that exhibit intelligent behavior

is a centralized architecture with perception, cognition, and execution functions implemented as separate but interconnected subsystems. However, from the engineering point of view a centralized architecture is not feasible. For example, the complexity of a centralized perception subsystem for an intelligent workplace would be hard to imagine. For an autonomous vehicle working in a workplace such architecture is not truly practical. Centralized architectures are on the way out even in decision support systems, which are less complex since they do not have to process sensory data.

The usual approach to reducing complexity is to adopt a multilevel hierarchical architecture with perception, cognition, and execution functions distributed at various levels of the hierarchy. Many systems of this kind are under development. However, hierarchies have a major disadvantage and that is their rigidity. Evidence is mounting that hierarchies are not suitable for environments characterized by frequent changes.

A number of very successful prototypes of intelligent systems have been constructed using the so-called layered architecture.

Intelligent Systems

Intelligent systems are concerned with the theories and techniques for building computer systems which exhibit some form of intelligent behavior. The area has had an active and exciting history and is now a relatively mature area of computer science. Many of the research discoveries have reached the point of industrial application and products, and many companies have made and saved millions of rupees by exploiting the research results in this area. However, many challenging research problems remain.

Fig. 2: Future of intelligent systems

From the perspective of computation, the intelligence of a system can be characterized by its flexibility, adaptability, memory, learning, temporal dynamics, reasoning, and the ability to manage uncertain and imprecise information. In general, intelligent systems have to deal with sources of uncertainty[2], such as the occurrence of unexpected events, and uncertain – incomplete, inconsistent or defective – information available to the system for the purpose of deciding what action to be taken next.

At large, AI comprises of two key directions.

1. Humanistic AI (HAI) that studies machines that think and act like humans. HAI is the art of creating systems that perform functions that require intelligence when performed by people. It is the study of how to make computers do things at which, at the moment, people are better.
2. Rationalistic AI (RAI) that examines machines that can be built on the understanding of intelligent human behavior. RAI is a field of study that seeks to explain and emulate intelligent behavior in terms of computational processes. It is the branch of computer science that is concerned with the automation of intelligent behavior.

Intelligent systems as seen nowadays have more to do with rationalistic than with humanistic AI. Intelligent systems exhibit intelligent behavior as seen in nature as a whole. In addition, intelligent systems are motivated by the need to solve complex problems with improving efficiencies.

We distinguish between two classes of intelligent systems in the following Table 2:

Class	Definition	Example
Intelligent decision support systems	AI programs that advise and support decision making via human-computer interfaces	Intelligent decision support in health care (e.g. ADEMA - system for Asthma health care)
Intelligent machine systems	Machines and interconnected machines with embedded AI which are capable of operating autonomously	Intelligent robots, cognitive systems (e.g. Chiara - open source educational robot) as illustrated in the Fig. 2.

Table 2: Classes of intelligent systems

Three-layer architectures

The constituents of intelligent system, Shakey, were organized into a three-*layer* (high-, intermediate-, and low-level) architecture. The Shakey's programs and data can be assembled into levels. Shakey's perceptual and basic (motor) programs were embedded in the low-level actions, whereas the intermediate-level actions combined the low-level ones in various ways to perform certain common tasks. The high level was in charge of planning and overall execution of plans.

Low level:

- The low-level actions (LLAs) use a short and fast path from sensory signals to effectors.
- Important reflexes are handled by this pathway.
- Stop, Servo control of motors and so on

Intermediate level:

- Combine the LLAs into more complex behaviors
- Intermediate-level action (ILA)

High level:

- Plan is expressed as a sequence of ILAs along with their preconditions and effects.

In Fig. 3, interaction among programs in these levels is illustrated by connecting lines.

Three-layered architectures, such as the one used by Shakey, are used in several robot systems[5]. One example of a three-layered architecture is used in the German driverless "seeing passenger car" described by Ernst Dickmanns et al[4].

Multi-layered architectures

As an alternative to the three-layered schemes, Rodney Brooks[3] proposed architectures that controlled system actions in a way that reacted directly to changes in the environment without the need for planning. Initially called *subsumption architectures,* a way of decomposing one complex behavior into many 'simple' layers of increasingly

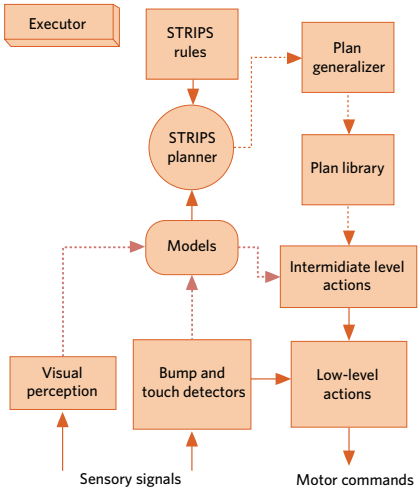

Fig. 3: Shakey system

more abstract behaviors. Every layer can overrule (subsume) the decision of the overlaying layer. These architectures were later called *behavior-based* because they were composed of programmed robot behaviors.

The different behaviors are arranged in levels, each responsive to its own set of environmental stimuli and each able to control the system depending on the sensed situation. Resulting overall behavior of a system that is not explicitly represented in a computer system is known as "emergent behavior".

Common principles present in behavior-based architectures are shown in Fig. 4.

Another popular way for achieving strategic behavior in behavior-based architecture is to couple a behavior-based component to a deliberative system. The deliberative system activates behaviors in a similar way to higher layers in multi-layered system. There may be domains where hybrid systems are more suitable than pure behavior-based models and vice versa. A number of hybrid systems have been developed to overcome the perceived weaknesses of other architectures. Most hybrid architectures divide the system into layers, generally one layer for high-level planning and another for handling the details of interacting with the world. The upper layer is usually a reactive planning system and the lower layer a reactive or behavior-based system. Hybrid systems may, in general, be more complex than multi-layered system because they require two different types of architecture whereas multi-layered system uses multiple versions of the one architecture. The integration of two architectures implies that there will be issues to resolve in order to get effective behavior.

The beliefs, desires, and intentions (BDI) architecture

Michael Georgeff and Anand Rao[8] have proposed perhaps the first agent architecture based on the philosophical concepts of beliefs, desires, and intentions. This architecture is proved to be the most durable agent architecture developed to date.

An agent's beliefs represent its knowledge about its environment (including itself and other agents), usually expressed in some kind of logical language, such as the first-order predicate calculus. An agent's desires represent the agent's goals - situations that it wants to achieve. An agent's intentions represent those desires that the agent has actually chosen to begin to achieve. That is, it has begun executing a plan to achieve them. BDI architectures, as distinct from behavior-based, reactive ones for example, explicitly represent beliefs, desires, and intentions as actual data structures.

Here, knowledge of the environment is held as *beliefs* and the overall goals are *desires*. Together, these shape the *intentions*, i.e. selected options that the system commits itself toward achieving. One feature of Procedural Reasoning System (PRS), illustrated in Fig. 4, is that the execution of a Knowledge Area (KA) may be interrupted by certain perceived situations (i.e. emergencies), giving it the ability to react rapidly to unanticipated changes in the environment.

Readers may refer to[6,7]) to know more on how the architecture works.

Architectures for agents alliances

An intelligent agent possesses some intelligence grounded on its *knowledge base, reasoning mechanisms*, and *learning capabilities*. Depending on the assignment of a particular agent, there are differences in types of information contained in its knowledge base. However, generally this information can be divided into two parts - *the agent's knowledge about its principal contained in owner's profile and the agent's knowledge about its environment*. Intelligent agents exist in environments containing other intelligent agents, both humans and machines. Many of these agents collaborate or compete in the performance of their tasks. Agent-to-agent communication strategies and multi-agent architectures have become important intelligent systems topics.

A very attractive alternative is to assemble a system from a number of autonomous intelligent agents connected in a network and capable of collectively generating desirable system behavior.

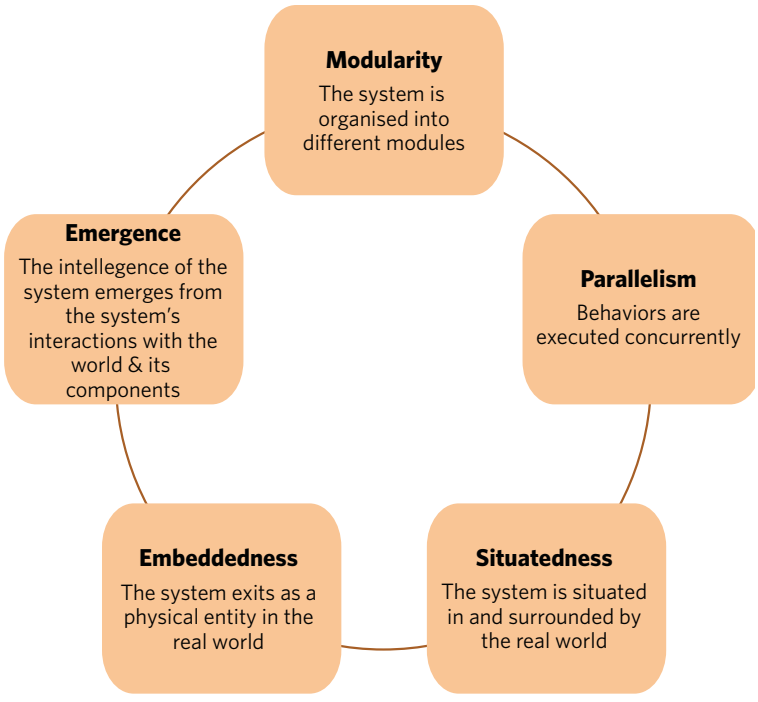

Fig. 4: Fundamental principles in behavior-based architecture

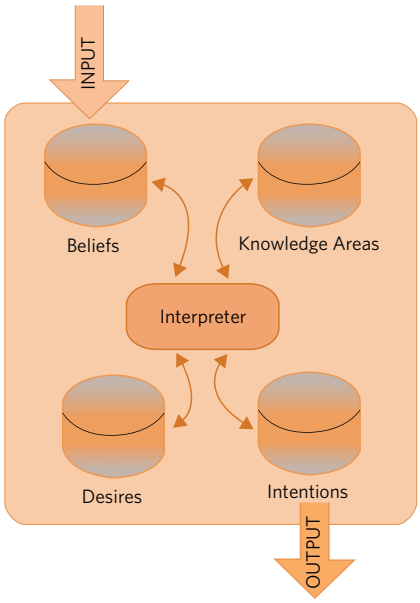

Fig. 5: The procedural reasoning system

Intelligent agents may be designed to operate in collectives, organizations similar to colonies of ants, in which every constituent element obeys precisely defined rules of collaboration, or in societies, organizations similar to human societies, in which artificial intelligent agents negotiate, collaborate, or compete among themselves.

Learning in Intelligent Systems

The learning process in intelligent systems involves acquiring information about its environment, and deploying the information to establish knowledge about the environment. Consequently, generalizing the knowledge base so that it can handle uncertainty in the environment. A number of machine intelligence techniques have been developed to introduce learning in machines[9], e.g. imitation learning and reinforcement learning. In case of robot learning, a multi-learning method is being used. The divide and conquer rule is also applied to the learning tasks. Each algorithm is given a specific task to handle. The learning algorithms are chosen carefully after considering the characteristics of the specific task. Alternative latent solution to learning is intelligent agents. Agents collect data and learn about the surrounding environment, and adapt to it. The learning process in agents also requires a self-organizing mechanism to control a group of autonomous agents. The task of divulging learning into intelligent systems is not simple; however the learning capability is what makes a system intelligent.

Research Trends

Truly intelligent systems should be able to operate autonomously, interact naturally with their environment and the humans therein, and be adaptive to changing situations and contexts, incorporating the user's preferences and needs. Nowadays, an encouraging range of isolated elements in the area of intelligent systems is practicable, including learning, vision, speech, planning, control and decision making. However, the focus of these developments is predominantly on performance in well-defined, limited domains. Popular attempts in creating artificial, intelligent systems are still largely restricted to systems designed for environments having limited scope and performing simple tasks. The ability to varying contexts and tasks without expensive redesign of specific, ad hoc solutions is still not realized.

New approaches are needed to intelligent system development, focusing more on understanding processes that lead to autonomous growth and development than on system development. We present some prominent research directions in the following subsections.

Interactive intelligent agents

Cooperation between agents must be based on the principles of alignment, entrainment, imitation, sharing, anticipation, and proactive interaction. There is a need for innovative theories of interaction to enable human-robot, human-human, and robot-robot interaction. The goal is to develop autonomous, interactive intelligent agents that operate within human environments and play a beneficial role in the daily lives of people. A key aspect in this field is multimodal interface technology, which allows humans and their environments to be perceived by recruiting signals from multiple audio-visual sensors.

Bio-inspired systems

The enhancement and emergence of cognition relies on artificial embodiments having rich perceptual and motor capabilities. Biologically inspired intelligent systems with such capabilities therefore represent the most appropriate experimental platform for studying cognition. Humanoid personal robots (see Fig. 6) are examples of artificial cognitive systems and a key growth industry of the 21st century.

The great challenge is the advancement of robotic technology to the point where interactions between humans and robots run smoothly and robots are able to fulfill roles in the human living space. Another important aspect is to capture principles of collective operation, such as altruistic cooperation, dynamic division of labor, and emerging communication that are applicable to a wide set of cognitive platforms and tasks.

It is therefore necessary to bring together biologists, control theorists, and cognitive scientists to develop principles and algorithms that hold in the reality of specific cognitive systems (say, robots) and animals; and also are general enough to be easily applicable to new platforms.

Intelligent simulation systems

For many activities, on-the-job training is very effective, providing the trainee with the chance to make real, quick decisions and see the consequences. Simulation systems that could portray realistic simulated worlds, such as the capability to produce realistic simulations of people, would enable development of training systems for such situations. Several commercial, military, educational, entertainment, and scientific applications need the capability of creating realistic simulated worlds. The systems we foresee here differ in both scale and function from those that exist today. The estimated scale of advance simulations is illustrated by the problem of providing accurate simulations of a crisis like 26/11 Mumbai terrorist attack that would be used in training crisis managers. Such simulations might require thousands of actors to play the role of victims, fire fighters, commandos, and emergency rescue squads. It might be economical to use actual people for only a few of these roles; the rest could be simulated. Intelligent simulation technology can assist people in such stressful, time-pressured situations to look further ahead in determining the consequences of proposed actions.

Biological processes & emergence

An important aspect for future intelligent systems is the notion of biological processes,

Fig. 6: A humanoid robot

called *morphogenetic* processes, which cause an organism to develop its shape, for information processing. This takes into account cooperation, stabilization, consolidation, focusing, categorization, and mode selection. Autonomous, interactive and incremental learning and co-developmental approaches will be a key element in the development of processes for emergence. We, human beings, acquire sensorimotor knowledge since from our childhood. This kind of learning is the focus of developmental approaches, which have gained a lot of attention in intelligent systems community in recent years.

Intelligent decision support

The enormous array of computational techniques and data available due to today's use of high-throughput technologies can be quite overwhelming for researchers investigating scientific problems. For any problem, there are many possible models and algorithms giving different results. New (innovative) intelligent systems need to be created that supports the selection, configuration, and operation of strategies and tools in the scientific or engineering domain. For example, a system that guides researchers in building a data analysis workflow and acts as an interface by rendering transparent details regarding the implementation of the tools proposed or the configuration of online services. This type of system should thus be an edge between traditional decision support systems (DSS) and workflow management systems (WFMS). The knowledge, in such systems, comprises expertise on the application domain, which is composed of heuristics and strategies derived from domain literature and experiments and/or provided by one or more human experts.

Intelligence and embedded reasoning

The Intelligence in embedded systems requires systems of sensors, actuators, and processors to be adaptive, distributed, and robust. Often, a tight coupling with both the physical world and temporal requirements leads to challenges in real-time execution and in process and communication concurrency. Such systems must be able to understand their environments and act intelligently and often autonomously, with (noisy) sensor inputs and imperfect models of system behavior. There is a need to consider the associated programming paradigms and approaches to validation, and fault tolerance. These systems must be able to interact efficiently with each other and with their human operators. Embedded reasoning methods will transform various application areas including robotics, transportation systems, defense, and industrial automation. Applications range from battlefield robots to aerospace vehicles, from prognostics to factory floors, and from printers to medical devices.

Research Challenges

Present-day challenges in the field of intelligent systems can be summarized as follows:

- Systems must be able to foresee body dynamics of the world and, thus, develop ability to reason about it.
- Novel approaches supporting the learning of new skills, adaptation of existing skills and the ability to switch between different learning modalities. The pertinent architectures and practices should allow for capability learning as well as autonomous and cooperative skill and strategy transfer to varying contexts and tasks.
- New frameworks and models for the representation and organization of enormous knowledge for complex sensory-motor control, choice and combination of actions for handling with everyday situations.
- Approaches boosting learning, recognition, and classification of objects and events.
- Methodologies supporting the development of systems that investigate their own sensorimotor primitives, body morphology, the environment and their effective interaction with it.
- Distributed complex platforms with standard or open software, which allow researchers from different fields to assess their concepts and provide a framework for the benchmarking of various algorithms.
- Efficient cognitive frameworks that allow the integration of perception, action, reasoning, learning, and communication components.

India has the potential to play a leading role in the analysis and design of future intelligent systems. However, the existing expertise in information theory, biological sciences, and social sciences can be more intensely bundled to provide better theoretical foundations towards understanding the processes and underlying mechanisms on which intelligence builds. Let us hope that through extensive international collaboration, a fruitful synthesis will emerge, giving technically oriented scientists new inspiration from biology and providing AI scientists with new ways to prove and evaluate their biological models.

Undoubtedly, substantial progress can only be made through a demanding dialogue among researchers from the fields of natural and artificial intelligence.

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Computing Intelligence to Enhance Web Personalization

Introduction

Internet and the freedom of expression brought a new avenue to everyone to publish their own ideas, stories, essays etc. on the web. Hence, the Internet is flooded with a lot of useful and useless information. It is very hard to define usefulness of information for a particular user which is varying from time to time. The useful information of one particular time may not be useful on a different situation. The Internet itself is evolving everyday with newer technologies. Since Internet is utilizing free style medium that accepts structured (XML etc.) and nonstructured (HTML etc.) format to publish an article in the web, finding not only the right information but to design them according to the taste of a reader is also a key challenge today and is called as Web Personalization. It is necessary to determine an appropriate technique to identify the features used in the web pages or in the web, to retrieve a web page of a user's intended choice among the different collections available in the web store, and to automate the redesign of existing web with or without human intervention. The techniques[3] should involve choosing a model to the data, determining some criteria to fit one model over another and the technique should search the data to match with the predefined classes of users. The nonparametric models which are absolutely data driven statistical concepts in which no explicit equations are used to determine the model but the model adapts to the data at hand, are well suitable for the above stated situation. This article tries to identify and analyze such techniques to choose the right approach to modify links or remove irrelevant information as per the taste of user, or retrieve web pages well in advance (caching) for the user's intended choice, and thus tries to enhance web personalization.

The Key Challenges in Web Personalization

Everyone knows about the explosive growth of web and the demand for search engines to find required information on the web. The users are not ready to spend much of their valuable time but want to get the required information within a minimum span of time. The only solution to the above problem is web personalization. It is quite common to confuse personalization with targeting. Targeting[3] is a technique to display advertisements at other sites to get users to visit a particular website. On the other hand, web personalization is a technique to display advertisements for a particular user. Though the word "web personalization" is very common among web users, it is a tough task to adapt to the expectations of individual users due to the following reasons:

1. Structured and unstructured nature of data
2. Huge volume of data
3. Client/server side setbacks
4. Identifying & retrieving relevant data/information
5. Identifying & retrieving required data/information
6. Identifying & retrieving similar type of required data/information
7. Eliminating irrelevant data/information from the set of relevant information
8. Identifying links to and from web pages/hub pages
9. Creating index and rank among relevant/required information
10. Identifying & retrieving user-specific contextual information due to privacy
11. Identifying user behaviors/usage (access) patterns of a user due to security
12. Identifying users and their desire due to change of interests/multiple interests over a period of time
13. Identifying single/different users on a same machine and retrieving their click stream data
14. Identifying similar (like-minded) group of users due to proprietorship of applications

In a nutshell, web personalization attempts to provide user the required information without asking them explicitly but would try to follow them to determine their access (behavioral) patterns and their interests.

The Evolution of Web Personalization

It is obvious that every challenge creates numerous opportunities. When the web users find it very difficult to get their required page, then there is a huge demand for search engines and portals. A few companies tried to develop search engines to show relevant pages to the user whereas portals were also trying to give the relevant information. But those search engines and portals provide[6] the same results for different personalities, intentions, and contexts. Hence, to offer the required information, web personalization emerges with a lot of potential.

To start with, one[3] of the email providers tried to offer personalization in which the users tried to alter their screens and their choice of information. Today, it is quite common that every one is trying to personalize their web pages as per their wish, which includes demographic information, educational qualification, job, hobbies, entertainment, likes and dislikes etc. That is the user registers[2] himself/herself with a particular website and exclusively provides all such information which is now known as user profiling. But the objectives of web personalization differ from those of user profiling so that the website must move in an intelligent way such that it must identify a user, based on the access pattern of the particular user and impress the user by loading and displaying the required intended information.

Web personalization would require such an intelligence to outperform in the area of classification, clustering, association, or even prediction. The distinguished[4] desire of a user can be identified through classification, clustering is used to identify the group of users with the same desire, and the prediction would predict what the user really wants to have on the web. Web personalization can be done in many ways; a few of them are explained[6] below:

- Interface personalization

It is very usual that the ordinary website expects a user to start visiting pages from its home directory whereas the website with interface personalization permits a user to visit a specific page of his/her interest rather than to start from home page. Nowadays, most of the websites provide loading of ordinary HTML web pages for the slow connection, special pages for fast Internet connections, and loads the web pages that are designed for a specific widgets. Thus, the web

creates a friendlier atmosphere and hence increases the productivity of the individual users.

- Content personalization

The web is flooded not only with a lot of information but is also using diverse media types including text, images, audio, and videos with heterogeneous formats like HTML, XML, postscript, PDF, JPEG, MPEG, MP3 etc. So the need for filtering information in the web arises. The act of filtering contents like Web, News, Images, Videos, Map etc. or the act of filtering advertisements, providing web page ratings, and presenting the pages in such a way that the user can choose anyone is known as Content Personalization.

- Service personalization

The leading dot com companies are introducing unlimited number of web applications/services everyday. No one needs all such services at the same time and that may be overloaded in servers' memory. In order to effectively present services expected by the user, service personalization plays a vital role. The act of filtering service options like creating alerts, getting similar pages, searching for a research article etc. is known as Service Personalization.

- User profiling

Since multiple users are using a system in a net cafe, it may lead to a confusion state to identify a particular user. So, the users are expected to register primarily with the websites, and then the web follows the user to identify his/her nature of using system and compares his/her style of operation with the existing patterns and also collects the other necessary information either implicitly or explicitly. After analyzing it with the existing models, it would suggest his/her anticipated[1] items or services. Combine, Compare, Connect, Explain, Find, Monitor, Recommend, Remember, Reveal, Sort, and Trigger are the keywords in User Profiling.

- Personalizing search

Although many classes of information exist in the web, some may look for webs, blogs, news, images, audios, videos etc. for their purposes. A professor may look for existing references like lecture notes, power-point models, programming samples etc. A financial adviser may look for the share market-related information of selected few corporate companies. An Indian may look for his country-specific information. Hence, the search results should be presented either on a demographic basis or on the user's intended selection basis. Employing cookies to find respective details from the user machine and based on his taste, presenting the result is known as Personalizing Search.

- Recommender system

Association plays a vital role in promoting a service or product. Many dot com companies use this association to find related items, services etc., and recommend as part of their presentation. One of the leading book sellers recommend/promote similar type of books that are purchased together by a previous customer once the user selected a book. Nowadays, some of the leading email service providers are also offering these types of services. The act of recommending for the present based on previous experiences gathered is known as Recommender System.

- Contextual personalization

This is one of the most expected properties of the user. Again, user-centric approaches play a significant role in this type of personalization. Selecting a typical content, retrieving such content well in advance before user specifies which is known as Caching, and presenting them with the format which a user expects are some of the common tasks. So, Context Personalization refers to adjusting to the browsing context of the user, during the session.

- Semantic social networking

Semantic social networking is the way the world of web is moving today. The web should understand a user based on the usage pattern, preferences, likes and dislikes etc. This approach is entirely different from the previous approaches as the user may connect to friends, relatives, academicians, colleagues etc. and show his interests on a topic, discussion, chatting, supporting, caring, voicing, and viewing. When a user shows interest on acquiring new friends, the web should provide such a friendly environment as desired. Building a social network which can recognize the meaning of existing objects and the relationship to the upcoming objects with respect to the user and his group is known as Semantic Social Networking.

Personalization functions[5] such as memorization, guidance, customization, and task performance support are very useful to accomplish all the types mentioned above.

Intelligence Inside Web Personalization

The core of this article is to analyze nonparametric techniques available for web personalization. There are many such techniques available for not only personalizing the browsing experience of a user by dynamically[1] tailoring the look, feel, and content of a website to user's needs and interests, but also to broaden user relationships, provide continuous relationship to build users' confidence, help automate the process of proactively introduce new products to them, provide the ability to measure user behavior, and track how well users are responding to the advertisements. The Fig. 1 depicts the relationship between web activities and the techniques behind web personalization.

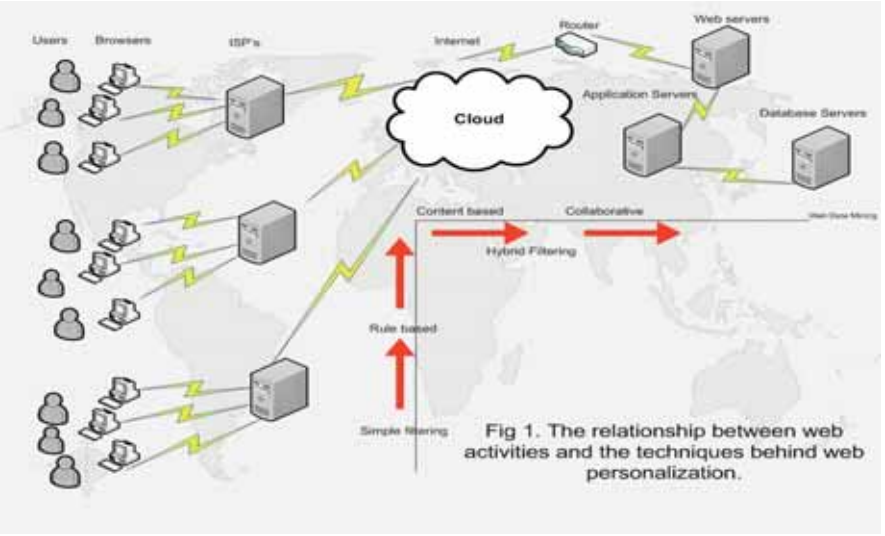

Fig 1. The relationship between web activities and the techniques behind web personalization.

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Role of Artificial Intelligence in Enhancing the Effectiveness of Education

Introduction

The interest in using whatever technology is available, to enhance educational process, has been a long standing quest. As soon as computers started becoming known, there have been attempts to use them for education. Early page turner packages are examples. These essentially showed page after page of text, asking questions to check if you have learned the contents, and redisplaying the same page, till you get the questions right. We have come a long way from those systems. Education has been a favourite playground for Artificial Intelligence almost since its inception[2] - interestingly not too long after the arrival of computers itself. Intelligent tutoring systems predates today's e-learning by over two decades.

Many places, the world over, are using information technology in various ways in education. This could range from preparing slides using a presentation tool, to delivering lectures online in a synchronous mode using a video conferencing system. There are hundreds of learning management systems available including the well-known open source one called "moodle", and a number of commercial systems. There are many companies specializing in content creation for schools, for professional training, and for specialized subjects such as medicine. E-education is today a fast-growing area, technologically and commercially. Assessments are also slowly feeling the impact of technology, with growing interest in online examinations. Given the limited lab infrastructure available in many schools/colleges, interest in online labs, which provide simulated environments on which the student can perform experiments, is also increasing (see Fig. 1).

Fig. 1: Example of online labs

Though, the field has been quite fast in adopting newer platforms and development environments, the same cannot be said about exploiting the power of these technologies. One major strength, which ICT brings in, is the ability to personalize. When you interact with the computer system, the program needs to be concerned only about you, unlike a teacher lecturing in a classroom. Even when conducting examination, it is possible to pose a specialized test paper for the specific person. With automated evaluation, this causes no additional overhead in a computer-based environment. But, a look at the current offering shows that in most cases, we have only digitized the traditional resources such as textbook, and are delivering them quite the same way, as we do in a classroom/college.

The primary reason for this reluctance is the likely increase in complexity of the application. Personalization requires addressing some important, but difficult, questions. For example, how does one characterize a person? What aspects can be changed in a person-dependent way? How to store and manage the learning resources to facilitate such handling? And so on. This is a fertile ground for 'intelligence'. Most of these issues relate to aspects of what makes a good teacher, and thus, we are into the realm of modeling and emulating the functioning of some 'intelligent' activity.

This paper will expand on this theme. We start with some relevant AI issues in addressing this (and other similar) problem in education, and see why we need AI. We shall then briefly look at two specific aspects of such a personalization - content selection/delivery, and tutoring. A brief glance at other opportunities for AI is also made, specifically relating to assessments. We wrap up, then, with some conclusions on the road ahead.

AI Meets Education

The core of AI is efficient ways to represent relevant knowledge and efficient algorithms to make use of that knowledge for solving problems. The algorithms are usually dependent on the domain of interest. The kind of problems outlined in the previous section gives plenty of opportunities for both these - and hence the interest of AI community in education.

Perhaps the most important ingredient of what makes a good teacher is knowledge of the subject. Most of the software systems we know of also have a lot of knowledge of the domain they deal with. How does a teacher's representation of knowledge differ from this? A teacher needs to be able to visualize the knowledge externally, and not just know how to use it to solve a problem. He will need to relate a student's knowledge of the domain, to some "ideal" knowledge and find gaps and deficiencies. He needs to be able to relate the different parts of knowledge, and use these relationships to communicate the subject to the student.

When you write a program to compute the LCM (Least Common Multiple) of two numbers, the program needs to know how to compute the LCM. Such a program can efficiently produce the LCM, for a given pair of numbers. It may even give you a trace of the factors it found and the final product (see Fig. 2). To this extent, this program "knows" about LCM. However, this cannot tell you why a particular factor was not included, or why a given number is not a factor. A teacher needs to be able to do such things also. So, the knowledge of LCM in the program needs to be made more explicit, so that the "teacher component" can probe that knowledge for answers to such questions. See Fig. 3 depicting what a 'tutor program' on LCM would do. Ideally the knowledge would be so explicit that one can even link LCM to GCD, Prime numbers, etc. Usually programs meant to solve a problem, do not go this far, and therefore, they make poor learning devices. The story of building a tutoring system from the famous and pioneering

```
>> LCM 20,10
Ans: 20
>> LCM 20,10
Considering 2 – a factor
Considering 2 – a factor
Considering 2 – not a factor
Considering 3 – not a factor
Considering 5 – a factor
.. no more factors ..
Ans: 2x2x5 = 20
```

Fig. 2: LCM as a standard program

expert system MYCIN is very instructive in this regard[4].

Thus, we need an explicit model of the domain being taught including the relevant concepts and their interrelationships. Many of the popular knowledge representation models of AI have been used by tutoring systems for this purpose. Many have explored 'if-then' rules as a generic knowledge representation mechanism. Prof. Anderson's group at CMU, USA leads this effort with their ACT* framework. Using this as the base, they have formulated a class of tutoring systems called Model-tracing tutors[3]. A number of tutoring systems based on this framework are in routine use in US and elsewhere. All domain knowledge in these are represented as if-then rules. The sequence of rule firings reflects the 'progress' in problem solving - for both the teacher and the student. Using a different sequence of rules may mean an error in solving the problem, or an alternative approach to solving the problem.

Rules are not the only way to do this; nor are they always the most desirable option. Semantic networks provide a richer, but more complex, structure to capture domain knowledge. Ontologies,

```
>> LCM 20,10
Enter your factor: 2
Correct. Numbers are now 10,
5
Enter your factor: 5
Correct factor. But there are
other factors smaller than this.
Enter your factor: 2
Correct. Numbers are now 5,5
Enter your factor: 0
Termination condition not
reached.
.....
```

Fig. 3: LCM program as a tutor

made popular with the advent of semantic web, are essentially a kind of semantic network to capture key concepts and their interrelationships in a domain. One can easily capture concept dependencies (e.g. cpu-architecture is a prerequisite for cpu-scheduling) and hierarchies using such a structure. While rules lack expressive power for representing such information effectively, ontologies need additional support for capturing procedural knowledge which is often a key ingredient in problem solving.

A bigger challenge, perhaps, is capturing the 'wrong knowledge'. Student's knowledge of a domain, in the early days, was believed to be a subset of the 'teacher's knowledge'. That is, whatever is learned is correct knowledge, but there may be some pieces missing. Today, this belief is no longer considered valid, for most domains. Learner's knowledge may overlap with the teacher's knowledge, and may include aspects not covered in the later, as well as some 'wrong' understandings viś-a-viś the teacher's knowledge. Note that a different conceptualization of the same knowledge need not necessarily be wrong conceptualization. This view makes the representation of the student knowledge quite complex. Systems using rules to represent the problem solving, may recognize and include alternate rules' to capture these[1]. These alternate rules may be wrong rules resulting in buggy behavior, or a different way of solving which produces expected correct solution at the end. Consider extending this idea to other knowledge representation models like neural network, decision trees, semantic network, fuzzy logic, etc.

Thus, in short, e-learning poses one of the toughest challenges for knowledge representation. We now look at two specific e-learning applications which go beyond the simple animations and page turner courses we often see.

Building an Intelligent Tutoring System

An intelligent tutoring system (ITS), usually denotes a tutoring system supporting one-to-one teaching on a fairly narrow domain[7]. Troubleshooting of electric circuits, diagnosis of faults in equipments, algebraic operations like root-finding and factorization etc. are examples. The focus is on topics which are of a problem-solving nature, as opposed to general, conceptual, or descriptive materials. And the main idea is to provide the learner a rich problem-solving environment, where the system will pose problems, and the student attempts to solve these problems. The system keeps an eye on the student's progress, and intervenes as appropriate to help the student solve the problem correctly. It is this aspect that makes the topic of ITS challenging[6]. At the same time, since ITS offers an environment where a student can work at his own pace, and where he is presented tasks to "do", ITS provides a very effective learning aid, compared to watching examples, or listening to lectures. Therefore, ITS has attracted interest from educationists as early as the 80s, which was the golden era for ITS[4].

However, monitoring the student effectively, and planning appropriate interventions needed technologies which were too challenging for the computers of that time, and hence the field did not take off practically. Now, with affordable and powerful computers, and the presence of World Wide Web, the interest is returning. From simple textual page turners, to video lectures, through animations to interactive simulations, e-content has come a long way. ITS appears to be the next step in this evolution!

A typical ITS has three major components, in addition to the user interface, as shown in Fig. 4. The core component is the pedagogic module, which embeds pedagogic and tutoring knowledge, and decides the following on a continuous basis:

- What problem to give the learner next?
- What intervention is appropriate at this time?

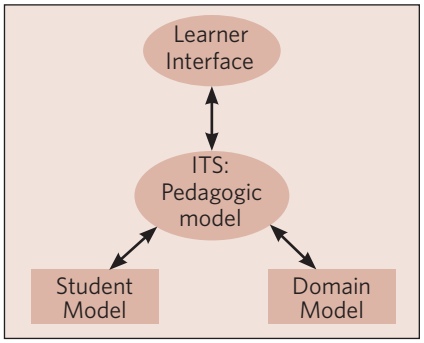

Fig. 4: Architecture of an ITS

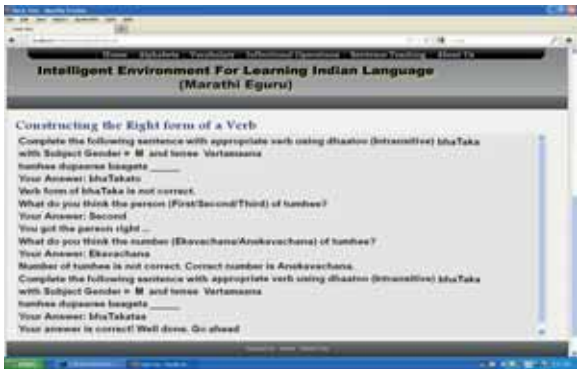

Fig. 5: Marathi eguru intervention strategy

The learner model keeps track of the student's profile - including various preferences - and his current knowledge profile (what he knows to what extent, and his current goals). The domain model represents the domain of the ITS including the misconceptions etc. In last section we discussed the issues in doing this effectively.

The overall functioning of an ITS is as follows. Depending on the current state of the learner, a suitable problem is selected. This is presented to the learner. Learner attempts to solve the problem, and informs the tutor of the intermediate steps as he goes about doing this. This is, basically, to enable the tutor to follow the student's logic and locate difficulties at a detailed level, rather than saying "your answer is wrong". When the learner seems to take a "wrong" path, the tutor may decide to intervene. The intervention can vary from keeping quiet for a while, allowing the student to detect the error on his own, to informing the student that "your step is wrong, here is what it should be". In between, there is a range of options such as flagging that there is an error letting the student locate it, asking a probing question encouraging the student to review the current step, and so on.

A number of interesting questions arise here, from problem selection onwards. Choosing a problem to present, within a small domain, requires characterization of the 'complexity' or 'difficulty' of different problems, and then indexing them suitably, so that for a given profile, we can find out which kind of problems to give. In the example of LCM above, we can identify classes like small numbers (less than 20, say) and larger numbers, numbers without common factors, prime numbers, numbers with no repeating factors etc. Building such categorization for the specific domain, and then building tools to generate problems of given category is an interesting problem. Using a reasonably large repository of annotated problems was a common approach. But in many domains, it is possible to generate problems meeting given constraints, e.g. prime numbers in the 40-100 range. This provides a richer collection of problems in the system. However, the system's knowledge representation needs to be smart enough to generate possible solution paths for solving such generated problems, and also possible alternative solutions and erroneous solutions - another interesting playground for AI.

The second problem is to understand what the student is doing. Ever tried to guess the intention behind someone's action, in real life? This is a similar problem! We have some intermediate steps - usually not many - and from that we need to figure out: 1) if he is proceeding correctly and 2) if not, what mistake he is doing. Particularly when you generate problems (see previous para), it is not possible to pre-list all the expected intermediate step outcomes, to compare against. So, whether the step is correct or not, need to be done by an analysis of the answers. In the LCM example above, the response was just a number. We only needed to check if this is one of the expected numbers, and proceed accordingly. But consider a language tutoring system where you want to know if the student can form verbs properly. The best option is to ask the student to write a sentence, and you can check if the subject and the verb matches in gender-number-person. But this requires reading the input sentence and identifying the constituents. Since the student is a learner, the sentence may not be grammatically correct. Reading such sentences and identifying the constituents can be difficult. So, generally systems resort to some kind of scaffolding. See Fig. 5, a snapshot from a Marathi tutor, where a Marathi sentence is given with just the verb missing, for the student to fill. Thus the student response is constrained to just a word, which is the proposed verb. This enables a much simpler analysis process.

Having understood the response, next task is to analyze its correctness. Is he going on the right track? Is the current step performed correctly? This requires matching with the stored domain knowledge for the correct path, and for possible wrong paths. Often these are not syntactic matches; but will need to allow a lot of tolerance to various aspects. For example, x+2*y can be written in many ways (e.g. y*2+x) without changing its meaning. And the match also needs to reveal to the system, the possible reason why that path has been taken[1].

Once it is recognized that there is something wrong, an intervention needs to be planned. This is also a complex process requiring careful modeling and representation. In the Marathi Eguru example in Fig. 5, the system engages in a short dialogue helping the student identify the error on his own. The dialogue first checks if the error is due to wrongly guessing the person of the subject, and then looks at wrong guess of the number of the subject, and then use of wrong inflection rule. Only as a last resort the system provides the direct correct answer.

All these aspects involve sophisticated knowledge representation and intelligent inferencing. There is so much more to elaborate on the strong dependency on AI, for an ITS to be effective. Most of the issues highlighted in this section have been at the center of attention in AI. Strong and powerful representation of different types of knowledge - domain knowledge, common misconceptions, tutorial strategies, analysis resources, and so on - is key for ITS to work. Though a number of practical ITS systems have been built in various domains, the area continues to offer many challenges[6,10]. And hence ITS is a very significant and interesting territory for AI enthusiasts.

Personalizing Instruction

As mentioned in the beginning, making the teaching personalized to the profile of the individual learner is an interesting and attractive option in education. It is almost like having your own tutor, who would explain concepts in ways you can understand better, choosing the right kind of examples, keeping the right pace, and

Fig. 6: Anurup: example content tags

so on. It can also omit parts you already know, and elaborate parts where you are likely to face a problem. Thanks to all these, of late, a lot of interest has come up in this area[5]. There are a number of aspects in making such a system effective.

Firstly, we need information about what is comfortable for the student and what is not. This is, often, expressed in the form of learning style, e.g. a visual learner prefers visual material - pictures, images, etc. - than textual material. A number of classifications of learners exist (e.g. Felder Silverman model, Honey and Mumford model etc.)[8]. In addition to the learning style, his prior knowledge, aptitude for different types of subjects, language of choice, etc. can also be factors in 'defining' the learner. We also need to understand what kind of personalization is possible against these properties. For example, languages known can help select those resources which are in one of these specified languages. This is a simple match. But, prior knowledge, proficiency in language etc. make the matching a complex task.

Personalization in instruction has a lot of more important possibilities as well. Teaching a topic to different learners can vary in your pedagogic approach. Apart from choosing material that is visual, auditory etc. the approach difference results in one person starting with the definition, and then the examples, whereas for another person, the examples may be presented first. Explanations may or may not be included. Number of examples may also vary. For such kind of personalization, the content organization poses fresh challenges.

Anurup - see Fig. 6 - is an adaptive instruction system developed at CDAC Mumbai. It organizes content in a goal/concept hierarchy first, and then when you reach the granularity of a topic, it breaks the content into pedagogic components. Component pieces are tagged as introduction, definition, example, explanation, and so on. These are put together in a learner dependent way when delivering to the learner.

Personalized instruction is also a domain requiring AI capabilities of matching, content organization, and natural language processing. Learning style formulation relies on machine learning, fuzzy logic etc.

Other Roles for AI

Other than instruction design and delivery, there is much else to which AI can add value. With the increasing use of LMS and online testing environments, we are able to collect a whole lot of detailed log of a learner's online behavior: which question/resource is he trying first, how long does he spend on a resource/question, what is he reading, what does he respond to etc. These behaviors carry signatures of the person, which could be revealed if only we could analyze these data effectively. When such data is collected over a long enough period for adequately large number of learners, we can exploit data mining and machine-learning techniques to unravel such information. This can help create more accurate and dynamic knowledge profile and learner profile of the learner, as well as more specific feedback to the content creator/questions setter/teacher/etc[9]. Availability of reliable data in adequate volume is the major deterrent in making this work in practice.

Assessment is another area that has attracted a lot of AI interest. Creating examination questions regularly, and more importantly, evaluating hundreds of student answer sheets under time pressure are two of the tasks most teachers would love to be rid of. While both these are important to complete the teaching-learning cycle, the numbers make these tasks a nightmare. There are also challenges of consistency to be addressed when the numbers are large. Not surprisingly a lot of aspects of assessments have been targeted for automation. Today plenty of software are available for question banking, online testing with multiple-choice questions, and associated reporting. Mostly they use common software technologies to automate the well understood parts of the assessment process. What are the opportunities for AI here?

Evaluating objective-type question is now well understood and easily automated. Objective-type questions in a broad sense - fill in the word with one or two correct answers, match two sets of items, etc. - are also supported by most of these systems. The challenging part is the long answer or essay-type questions - ranging from 1-2 sentences to multiple pages. Reading through pages of handwritten essays, figuring out the students' state of knowledge, and mapping them to marks is a complex problem. Often due to time pressure, these steps are trivialized through techniques like keyword scanning. Mapping to marks has the added challenge of keeping consistency across students: two students with similar solutions must get similar marks.

This problem has fascinated researchers and educationists for a long while. A satisfactory solution is yet to emerge. One will need a fair degree of natural language processing to make 'sense' of the essay itself. Whether 'proper understanding' or even full parsing of the sentences is needed, is an open issue, with the current trend favoring a negative answer. A good effective solution is surely going to require a combination of many AI disciplines like ontology (for the domain), machine learning, information retrieval, and natural language processing. Approaching subjective evaluation generically appear to be nonfeasible, based on some preliminary studies we had done. It is possibly more fruitful to look at it separately, for different classes of problems, such as 'compare and contrast', 'explain the steps', 'enumerate advantages' etc.

Another interesting topic which has attracted attention and require the help

George became president of IKG in 1997.

- Who became president of IKG in 1997?
- What role did George take in IKG in 1997?
- When did George become president of IKG?

Fig. 7: Generating questions from a single sentence

As in the 80s-90s era, personalization is an interesting R&D area from both education perspective and also from the technology perspective. International journals like 'Journal of AI in education' and a number of specialized conferences, demonstrate the significance and interest in this intersection of AI and education.

of AI is automated question generation. Some trivial generators are easy to visualize (see Fig. 7). Beyond this easy transformation of single sentences, the problem becomes hard. Generating questions like *explain the notion of quantum particle, why did the mixture explode, compare approach A with approach B,* and so on are harder from this perspective, as focus shifts to units larger than a sentence, perhaps to multiple sections. This kind of question generation is an active research area, with some practical successes when certain restrictions are imposed.

A more restricted case of question generation is question instance generation from a template. Consider a template like:

Given a rectangle with length X and width Y, what is its area?

By substituting different values for X and Y, we can generate different instances of this question. Defining such templates is a task ranging in complexity from trivial to impossible for different questions. In the above example itself, one can see some aspects of the challenge. One cannot put any arbitrary value for X and Y. Since X is called the length, its value must be larger than that of Y. Similarly both these must be numbers. Fields like this in a template can involve many such types of constraints, some unary constraints (e.g. data type, value range, etc), and some constraints relating to other fields.

At the other extreme, a question like "why did Betty insult Diana at the end?" is very hard to generalize, though one can visualize a template in the question. This is due to the complexity of identifying such constraints applicable to various slots, from the context, and specifying them in a way, that it can be checked at run time.

Conclusion

We have seen a sample of areas in use of technology in education, looking for AI capabilities. Many of these are practically important and also academically challenging. We are beginning to see basic capabilities along these lines coming into today's LMS and other educational applications. Intelligent tutoring systems are also slowly growing as an area, as computers and Internet is powering the drive towards more effective learning resources. As in the 80s-90s era, personalization is an interesting R&D area from both education perspective and also from the technology perspective. International journals like 'Journal of AI in education' and a number of specialized conferences, demonstrate the significance and interest in this intersection of AI and education.

Many of the related aspects in this discussion can make interesting PhD problems. You are welcome to write to me, if I can be of help. One specific request is to build your work using open source resources, and share the systems you develop with all. It will benefit others to build on your work, and we could put good products into practical use - just as a lot of institutions are using packages like Moodle, which came out of research work elsewhere in the world.

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Article

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Cloud-based Mobile Solutions

Breathtaking recent advances in smartphone and allied mobile devices technologies have fuelled a new wave of user demand for rich mobile experiences. Today's ever growing mobile user base (both corporate and consumer) not only expect broadband Internet connectivity wherever they go and interaction with each other via social networks on the road, but also seek ubiquitous access to a wealth of media-based contents and services. Since mobile devices are inherently resource-limited (thereby limiting rich applications and services accessibility on demand), cloud computing is emerging as a promising technology to provide additional resources for many media-rich mobile applications. However, the synthesis between mobile media and cloud computing should be well orchestrated to address many technical, accessibility, and security challenges arising in this exciting space. The fundamental tension between resource-hungry multimedia streams and power-limited mobile devices has yet to be resolved. Efforts for providing a universal rich-media experience across any screen is typically hindered by the heterogeneity amongst ever-evolving mobile devices, as manifested in their varied physical form factors, middleware platforms, and interactive features. This challenge is further exacerbated by business concerns from different service providers (e.g. Telcos, MSOs, and ISPs), as well as security concerns from users and content providers. Mobile cloud computing could be the way to go for corporate as well as individual use but daunting challenges need to be addressed.

Cloud computing is gaining popularity with tasks and data hosted on the Internet to offer on-demand access to users. With the provision of data by the service provider, applications are availed on a remote server that is applicable to the user wherever the user may be. Although this form of computing is based on the development of desktop-based applications, the use of mobile applications in cloud computing is gaining popularity. With the increasing trend in application of mobile devices in cloud computing, research indicates that mobile applications will be widely used in mobile cloud computing[3]. The value of mobile cloud computing is that users are able to share computing resources without incurring huge expenditure on computer infrastructure. In addition, high-technical hardware is not needed to facilitate the operation of complex applications that are run within the cloud. With the development of powerful mobile phones, developers are able to access a wide market whereas users have access to powerful applications. Mobile phones have powerful browsers overcoming the computing restrictions that were formally associated with mobile operating systems.

How Cloud Computing Can Help in Providing Mobile Applications

Cloud computing plays a key role in the provision of mobile applications. This is achieved through the usage of cloud computing via mobile devices. This is possible when data and tasks are hosted on the Internet and on-demand access is possible via the use of mobile devices. The user will access the applications on a remote server[1]. The development of mobile devices and smartphones by Apple and Google have provided powerful browsers for mobile phones to facilitate mobile cloud computing. Companies now have an opportunity to explore mobile cloud computing with major mobile network providers such as Orange, Verizon, and Vodafone offering cloud computing services for personal use and companies. Operating systems that are based on cloud computing have been developed enhancing the capabilities of mobile devices. The new operating systems facilitate Internet searches, powerful email capabilities, and extensive support for web-based applications. Mobile phone users no longer have to download applications on their mobile phones but can access them on the cloud via their network provider.

The Different Types of Mobile Applications That Can Be Provided Using Cloud Services

There are different types of applications that are supported by the cloud services. Mobile applications are composed of software that is run on the mobile phone to support different tasks. There are numerous application downloads available and the mobile application market is expanding with the availability of cloud computing. Cloud computing supports numerous applications, such as mobile commerce, mobile learning, mobile computing, and mobile health care. Mobile commerce involves the buying and selling of products and services via the use of Internet tools. Local, private, and public companies and individuals can access e-commerce avenues through the use of mobile phones. The mobile phone is used to access the Internet to conduct transactions and conduct market searches. This has boosted trade and decreased costs for businesses.

Mobile learning is gaining popularity as more and more people access Internet resources via their mobile phones to enhance learning. E-learning is now incorporating m-learning to enhance mobility and enable learners' access Internet resources at their convenience through portable devices. On the other hand, the development in technology and use of mobile cloud computing has enhanced access to health care. Mobile health care is heavily dependent on mobile devices for doctors to closely monitor patients and accessibility of healthcare services via the Internet. The quality of healthcare services has been improved as healthcare practitioners can collaborate on the Internet via the use of mobile devices to conduct research. A major concern with mobile health care however is the challenge of privacy since personal information on the Internet can be accessed by unauthorized people. Mobile computing has transformed computing resulting into development in hardware and software. Mobile computing facilitates email services, mobile banking, bill payment, and other personal services. I-phones, I-Pads, mobile phones, and Netbooks have transformed computing.

Risks Involved in Implementing Cloud Services in Mobile

The major risk that is associated with mobile cloud computing is the availability of networks and intermittency associated with online connectivity. To facilitate the service, the cloud application requires constant Internet connection and hence interruptions in network might lead to loss of the service. Although there are applications that provide data caching through mobile devices, unavailability of the network for longer periods implies that the cloud will be unavailable. Companies

may undergo huge losses if they run all their applications on the cloud once the network is lost. Although mobile cloud computing is an economical option for the company's IT needs, a major risk involved is data insecurity. Data on the cloud regarding the company and its operations may be accessed by unauthorized persons who may temporarily cause denial of service attacks to the company. Once this happens, the company's operations may be halted or the organization may lose crucial information to competitors. Companies have lost their business to competitors once they learn their strategies[2]. To ensure this is minimized, security on the cloud can be enhanced through the hosting of company's information on a private cloud that cannot be accessed by the public. The public cloud is insecure since it can be easily accessed by the public who may sabotage company's data.

Further Scope of Research in This Area

In the near future, mobile devices will be extensively used in computing and there will be no need of downloading applications to mobile handsets to use them. Users will be able to access these applications on the cloud via their mobile browser. This will enhance the approach of using software as a service and in the near future, the use of PCs in organizations will diminish as organizations make extensive use of mobile devices. The "Mobile Cloud" will be accessed by over 2 billion users and smartphone applications will be accessed from the handset to the cloud would facilitate an environment of intensive mobile computing. Although the area will record tremendous success, further scope of research is required in this area to address the challenges that mobile cloud computing faces. A major challenge is the availability of network since servers may be overwhelmed as they provide services to huge number of users via the Internet. In addition, there are also concerns on environmental challenges regarding the spaces in which the server and client will communicate. Delays and connectivity challenges are likely to emerge as the cloud attempts to support millions of users.

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Continued from Page 11

Let us discuss those common techniques which bring such intelligence into a web.

Simple filtering - This is the primary way of recognizing a user and preferences. This approach requires contents of both client side and server log information. By analyzing log information, frequently visited pages, and duration of each visit, the user's preferences can be identified. Based on the access pattern, it is also possible to classify whether a user is a potential customer or not.

Rule-based filtering - Once a user's preferences were identified, it provides the content to the users based on predefined rules like if he/she clicks India in Country option then it will upload all the information related to India like states, cities etc. This can be achieved by creating appropriate decision tree[3] based on a group of users and their priorities. Classification techniques play a vital role in analyzing typical desires on a web.

Content-based filtering - This is the task of analyzing contents of the website. By analyzing objects in the web, the related items can be grouped together and presented to the user. Users may show their affirmation to rate the items in a page. In order to find users preferences, users are presented a questionnaire[2] with the list of all items in a table where the users evaluate and provide ratings for each item under different category. Finally, either Euclidean distance or nearest neighbor algorithm is used to analyze the ratings to determine the preference for an item. The item with closest ratings could be recommended.

Collaborative filtering - This is also similar to that of content-based filtering, but the association between pages and similar user groups are given priority. The recommendations[2] are presented to the other similar users. An automated technique would determine the future needs based on the past need and the needs of similar users.

Hybrid methods - The combination of content based and collaborative filtering brought a new avenue to personalization. The shortcomings[2] of both methods are eliminated and thus, hybrid methods are a very powerful tool to do personalization.

Conclusion

We are living in an age of science. Science has made our life more comfortable. Human beings are expecting more and more sophisticated ways to gather information without any further delay. The Web is the only viable medium to disseminate such information and it is also accessible to every one in this world. As the data grows rapidly in the web everyday, the demand for fetching required information is a tedious job. Not only getting the required one, but also presenting the intended one with the taste of the user and to retain a user is also a challenging one. Applying web personalization would bring more and happier users to the web and also help to retain existing users and to increase their productivity as well.

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Article

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Image Processing with Matlab, Scilab, and Octave

MATLAB, Scilab, and Octave are widely used by engineers and scientists in both industry and academia for performing numerical computations and for developing and testing mathematical algorithms and image processing with related applications. It makes it very easy to write mathematical programs quickly and display data in a wide range of different ways for various applications, research, and development work. This article focuses on practical approach for image processing and mathematical computing with Matlab, Scilab, and Octave.

Working with Matlab

The name MATLAB stands for MATrix LABoratory. MATLAB is a high-performance language for technical computing. It integrates computation, visualization, and programming environment. It is a modern programming language environment with sophisticated data structures, contains built-in editing and debugging tools, and supports object-oriented programming. These factors make MATLAB an excellent tool for teaching and research. MATLAB is a script that runs main MATLAB executable on Microsoft Windows platforms and provides interactive system for solving technical problems. MATLAB documentation is mostly available online[1,4,5]. We can run Matlab script on various platforms like Windows, Macintosh, and Unix etc. Fig. 1 is a snapshot of Matlab working environment.

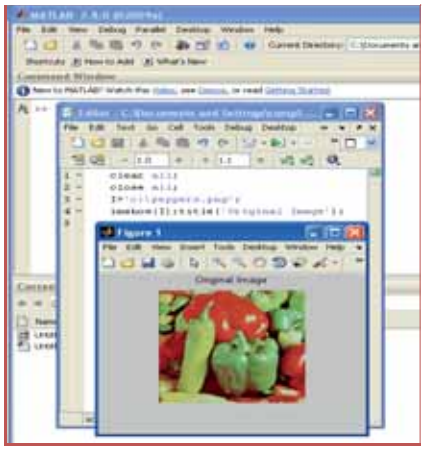
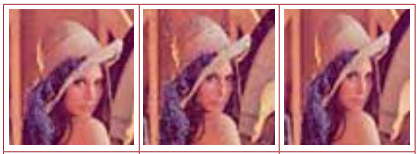


Fig. 1: Working with Matlab environment

Matlab provides efficient way for all image, audio, and video processing. Program Listing 1 shows sample read and display of image with noise addition and filtering. The output of sample is depicted in Fig. 2.

Program Listing 1:

```
clc;
clear all;
clear all;
 file_name='colorlina.jpg';
I=imread(file_name);
imshow(I);
title('Original Image');
J = imnoise(I,'salt & pepper', 0.02);
imshow(J);
title('Paper & Salt Noise');
% median filtering for remove salt
pepper noise
K = medfilt2(J);
imshow(K);
title('Filtered Image');
```



Original Image	Pepper & Salt Noise	Filtered Image

Fig. 2: Output of program listing 1

The variety of applications developed using Matlab can be found online[6].

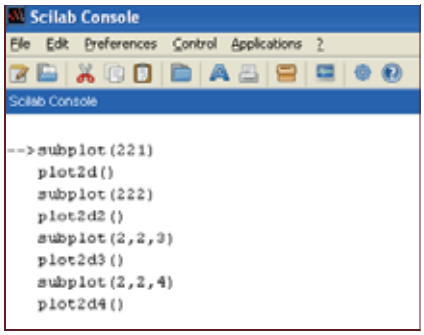
Working with Scilab

Scilab is an open source freeware software for numerical mathematics and scientific visualization of plot 2D and 3D graphs and other graphic functions. It is capable of interactive calculations as well as automation of computations through programming. Scilab supports following various capabilities: i] Linear algebra; ii] sparse matrices; iii] Polynomials and rational functions; iv] Interpolation, approximation; v] Linear, quadratic, and nonlinear optimization; vi] Ordinary Differential Equation solver and Diffrential Algebraic Equations solver; vii] Classic and robust control, Linear Matrix Inequality optimization; viii] Differentiable and non-differentiable optimization; ix] Signal processing, x] Statistics etc. We can download Scilab from the scilab.org website for windows, Linux, Mac OS[3,8,9].

While performing operations on images, the input images are saved in current working directory. The current working directory can be found by using 'pwd' at console.

As per requirement of application, console or editor can be used while working with Scilab. Sample plots are shown in Program Listing 2 with console operating and its output is shown in Fig. 3.

Program Listing 2 with Scilab Console



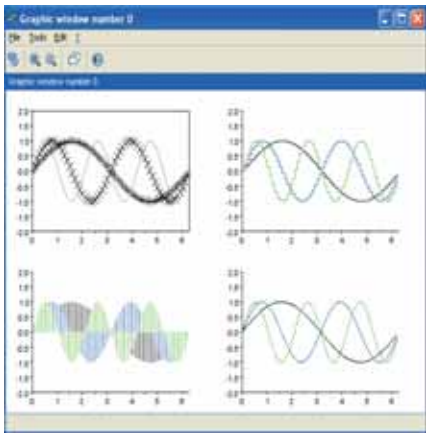
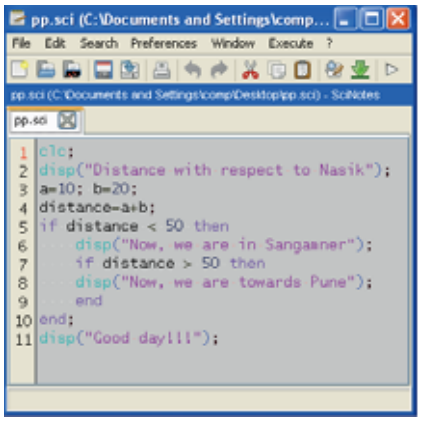


Fig. 3: Output plots of program listing 2

The editor can be opened just by typing 'editor' at console. The working with Scilab editor with sample Scilab script is given in Program Listing 3. To run Scilab script go to 'Execute' option in editor and select 'File with no echo'. The output of same is shown in Fig. 4.

Program Listing 3 with Scilab Editor




```
Distance with respect to Nasik
Now, we are in Sangamner
Good day!!!
- ->
```

Fig. 4: Output of program listing 3

Working with Octave

Octave is an open source interactive software system for numerical computations and graphics. It is particularly designed for matrix computations: solving simultaneous equations, computing eigenvectors and eigenvalues and statistics, signal and image processing etc. In many real-world engineering problems, the data can be expressed as matrices and vectors. Octave can be efficiently used with windows and LINUX. Matlab is more flexible, advanced, powerful, and costly but Octave is freeware. Octave texts are mixed lower and uppercase. Octave is case-sensitive. Octave makes it easy to solve a wide range of numerical problems; Octave's usefulness is enhanced by making it compatible with MATLAB which is commonly used in industry and academia.

C++ and other industry standard programming languages are normally designed for writing general purpose software. However, solutions to mathematical problems take time to program using C++, Octave is specially designed to perform calculations and display the results[7,10]. Steps of Octave installation for Windows are given below:

1. Go to http://octave.sourceforge.net/ and click on Windows installer.
2. Install the downloaded file: Octave-3.2.4_i686-pc-mingw32_gcc-4.4.0_setup.exe. and follow messages displayed on screen (Follow steps 1 through step 9.)

After completing installation go to 'start' then go to 'programs' and select 'GNU Octave'. Now, Octave console environment will be ready for use. Program Listing 4 depicts Octave console with sample matrix operations and concern output.

Program Listing 4 with Octave Console and its output

```
octave:1> a=[1 2 3; 4 5 6; 6 7 8; 9 10 11]
a =
1  2  3
4  5  6
6  7  8
9  10  11
octave:2> s=size(a)
s =
4  3
octave:3> b=rand(s)
b =
0.722364  0.909136  0.630090
0.676830  0.267017  0.065113
0.353159  0.825540  0.438571
0.135161  0.026703  0.463656
octave:4> size(b)
ans =
4  3
```

Here, Sample code for image read, write, display is shown in Program Listing 5.

Program Listing 5: Image read,write,display with Octave

```
I = imread ("my_input_image.img");
imwrite ("my_output_image.img", J);
imshow(I);
imshow(J);
```

Closing Remarks

Matlab, Scilab, and Octave are used by developers, engineers, and scientists for development in industries, academia, and in research work. Matlab has plenty of license toolboxes with numerous facilities fulfilling requirements of industry and academia. Scilab and Octave are open source freewares used as alternate for Matlab and used with Windows, Linux, Macintosh etc. The programmer familiar with Matlab can easily switch to Scilab and Octave.

Acknowledgment

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Mr. James Joseph
Founder of Professional Bharati

Convert Postman to Infoman

"Charity is not the way to make a real impact; it is sound business which makes an impact. Check what Motorcycles and Cell phones did for India. When government had no money to build roads to your homes motorcycles allowed people to move faster and get to work. With cell phones, even an auto rickshaw driver or carpenter is able to do more per day. Information Technology can do even more... Go figure!!"

This conversation happened during a plane ride from Mumbai to Bangalore with my super boss. After a good meeting with one of the visiting executives from our HQ we were traveling back together. We discussed almost an hour about business, and then boss wanted to know what I would like to do next. I told him I am happy with what I am doing now and when he pressed me again I made a mistake, second time in my life. First time it was in Dallas, after a long conversation in the corridor with my super boss on several great topics I said something about our business model, there was a long pause and then came the response in a thick French and African accent -"do you think i am... stupid?!" Luckily no damage done at that time but I had promised myself not to get into a situation like that with my super bosses ever again.

This time when I was pressed again I told him my long-term desire was to do something which would make a real impact on people's lives, like working for a charity, and I would like his help whenever I was ready to move. I should have stopped there but I unnecessarily got myself in to the Dallas moment by saying I don't think Information Technology can help me achieve my long-term desire of making a major impact on people's lives. There was a long pause but the response was more elaborate than the one word I heard in Dallas. He injected some sanity into my head with the motorcycle and cell phone examples.

Since then I had been brainstorming a concept of shared computing for every household in India with CIOs from corporate India, Computer Society of India and finally I was invited to discuss this concept at the India Post Roundtable by SKOCH Foundation. According to Ms. Suneeta Trivedi, Member (Planning) Postal Services Board, a postman has to walk to house number 93 to deliver one letter and it is a lost opportunity that he had nothing to serve the 92 houses he walked past.

My question is **"Can't we stick a tablet or a Kindle in the hands of every postman to give them electronic information they require and collect orders for whatever each household needs to purchase for the next week or so?"**

Current Corporate Plan of India Post says almost all paper movements through India Post has reached stagnation and need to find a way to increase this volume to be financially self sustainable. Instead, shouldn't we be thinking about nonpaper-based information through India Post? First of all these 92 houses will save a lot of productive time if they can get all government information they need from the various offices they currently travel hours only to find out the officer is not there. Second, manufacturers could benefit significantly from the aggregated point of sale or demand data from 100 million+ households in India. From my experience of working for the leading supply chain management solutions provider in the US, the number one value, organized retail can bring to India is, faster movement of point of sale (POS) data to the manufacturer to avoid demand supply mismatch.

If India Post can channel at least 10 paisa of every rupee spent by a household in India, it will be bigger than Wal-mart or shall we call it. *Bharat-Mart!* Mr. Bezos and mighty India Post, if you guys can partner we may not need FDI in Retail! ■

About the Author

James Joseph is the founder of Professional Bharati - a social networking platform for Indian Professionals. James has over 18 years of Sales and Marketing experience in North America, Europe, and India with Globally reputed organizations like Microsoft, 3M, and Ford. In his last role as the Director, Executive Engagement at Microsoft India, he was responsible for strengthening Microsoft's relationship with the senior executives of top 200 enterprises in India. Before joining Microsoft, he held business development, sales and marketing positions at 3M, Ford Motor Company, i2 Technologies, and Informatica.

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Kind Attention: Prospective Contributors of CSI Communications -

Please note that cover themes of future issues of CSI Communications are as follows -

- January 2013 – Enterprise 2.0
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- March 2013 - e-Libraries

The articles and contributions may be submitted in the following categories: *Cover Story, Research Front, Technical Trends,* and *Article.* For detailed instructions regarding submission of articles, please refer to CSI Communications April 2012 and/ or CSI Communications September 2012 issue.

[Issued on behalf of Editors of CSI Communications]

Jitendra Singh Kushwah
Assistant Professor, School of Computer Application, ITM University Gwalior (M.P)

Programming.Tips() »

AWK Basic

The word "AWK" is derived from the initials of the language's three developers: A Aho, B W Kernighan and P Weinberger. AWK is an extremely versatile programming language for working on files.

It is an excellent filter and report writer. AWK is an excellent tool for processing these rows and columns, and it is easier to use AWK than most conventional programming languages. AWK also has string manipulation functions, so it can search for particular strings and modify the output. There are few definitions of AWK:

1. "Awk is a programming language whose basic operation is to search a set of files for patterns, and to perform specified actions upon lines or fields of lines which contain instances of those patterns".
2. "Awk is a programming language that make it possible to handle simple, mechanical data manipulation tasks with very short programs, often only one or two lines long".
3. "An awk program is a sequence of patterns and actions that tell what to look for in the input data and what to do when it's found".

The essential organization of an AWK program follows the form:

```
pattern { action }
```

The pattern specifies when the action is performed. That is, the pattern specifies a test that is performed with each line read as input. If the condition is true, then the action is taken. Two other important patterns are specified by the keywords "BEGIN" and "END". BEGIN specifies procedures that take place before the first input line is processed. END Specifies procedures that take place after the last input record is read.

In AWK script, there is no need for declaration of variables using data type because we have only two types of data (Integer & string).

AWK is also an interpreter. We can create AWK using VI editor with .awk extension name.

```
$vi csi.awk → Create a script
```

Script for csi.awk is as follows:

```
BEGIN { print "CSI Communications" }
        { print "Wel Come You"}
END { print " - Thank You -" }
```

Note: END statement execute after press ctrl+d. We can execute AWK script using interpreter:

```
$awk -f csi.awk → Execute a script
```

Here "-f" option specifies the AWK file containing the instructions.

When we execute AWK script then statements are executed again and again which are enclosed by curly braces between BEGIN and END patterns until we press ctrl+d. Actually this will work as a looping statement.

Only two types of data in AWK: numbers and strings of characters.

- Awk reads one line at a time and splits each line into fields.
- A field is a sequence of characters that doesn't contain any blanks or tabs.
- First field in current input line is called $1, the second $2, and so forth.
- The entire line is called $0.
- The number of fields can vary from line to line.

AWK has a number of built-in variables:

- FS - Field separator
- NF - Number of fields in current record
- NR - Number of current record
- RS - Record separator
- $0 - Entire input record
- $n - nth field in current record

Examples:

```
$awk '{print $1, $3}'
$awk '{print $0}' OR $awk '{print}'
$awk '{print NF, $1, $NF}'
awk '{print $1, $2 * $3}' '{print NR, $0}'
```

Here is an example:

```
$awk -f ":" '/arun/ {print $1 " " $3}' tt.txt
```

-f	→ AWK executable
:	→ Field separator
/arun/	→ Pattern to search
tt.txt	→ The file to operate upon
{Print $1 " " $3}	→ Action to be performed online if pattern matches.

Here $1 and $3 are columns of file tt.txt and awk is the command to search pattern /arun/ and perform action to print column1 and column3 from a file. A program snippet will speak better than my description:

For example, A file emp.dat contains name, pay rate, number of hours worked, one employee record per line.

```
$ awk '$3 > 0 { print $1, $2 * $3 }' emp.dat
```

This statement prints the name and pay for everyone who worked more than zero hours.

At the time of execution of AWK script, we can pass some values to the script. For example:

```
$awk -f add.awk 4 5
```

Here, value 4 is treated as $1 column and value 5 is treated as $2 column.

Selection

AWK patterns are good for selecting interesting lines from the input for further processing.

a. Selection by Comparison

Task: A comparison pattern to select the records of employees who earn $5.00 or more per hour.

```
$awk '$2 >= 5' emp.data
```

b. Selection by Computation

Task: Print the pay of those employees whose total pay exceeds $50.

```
$awk '$2*$3 > 50 {printf("$%.2f for %s \n", $2*$3, $1)}'
```

c. Selection by Text Content

Task: Print all lines in which the first field is Susie

```
$awk '$1 = ="Jitendra"'
```

d. Combinations of Patterns

Patterns can be combined with parentheses and the logical operators &&, ||, and !, which stand for AND, OR, and NOT, respectively.

Task: Print lines where $2 is at least 4 or $3 is at least 20.

```
$awk '$2 >= 4 || $3 >= 20' emp.data
```

Data Validation

AWK is an excellent tool for checking that data has reasonable values and that it is in the right format.

Task: Use comparison patterns to apply five plausibility tests to each line of emp.data.

```
$awk 'NF !=3 {print $0, "number of
    fields is not equal to 3"}'
$awk '$2 <3.35 {print $0, "rate is
    below minimum wage"}'
$awk '$2 > 10 {print $0, "rate exceeds
    $10 per hour"}'
$awk '$3 <0 {print $0, "negative
    hours worked"}'
$awk '$3 >60 {print $0, "too many
    hours worked"}'
```

Fancier Output

- print statement is meant for quick and easy output.
- use printf statement to format the output exactly the way you want it.

printf statement format is as follows:

```
printf (format, value1, value2, …, valuen)
```

where format is a string that contains text to be printed with specification of how each of the values is to be printed. A specification is a % followed by a few characters that control the format of a value. For example:

Example 1: Use printf to print the total pay for every employee-

```
$awk '{printf ("total pay for %s is $%.2f \n", $1, $2 * $3)}' emp.dat
```

Above Example 1,

- contains two % specifications %s print the first value $1, as a string of characters %.2f print the second value, $2*$3, as a number with 2 digits after the decimal point
- no blanks or new lines are produced automatically; you must create them yourself. Don't forget the \n.

Example 2: Print each employee's name and pay.

```
$awk '{printf ("%-8s $%6.2f \n", $1, $2 * $3)}' emp.dat
```

Above Example 2,

- contains two % specifications %-8s print the first value $1, as a left justify string of 8 characters with trailing left spaces %6.2f print the second value, $2*$3, as a number with 6 digits before decimal point and 2 digits after the decimal point

Example 3: Print all data for each employee, along with his or her pay, sorted in order of increasing pay.

```
$awk '{printf ("%6.2f %s \n", $2 * $3, $0)}' emp.data | sort
```

Above Example 3,

- Pipes the output of awk into the sort command.

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Programming.Learn ("Python") »

Image Processing in Python

Let's have a look into one more capability of Python programming - image processing. Being a powerful programming language with easy syntax, and extensible to C++ or Java, it is suitable for developing embedded applications. Image processing is extremely important in Python Platform. With the help of Python modules Numpy and Scipy, Python competes with other similar platforms for image processing.

Python Imaging Library (PIL) is one of the popular libraries used for image processing. PIL can be used to display image, create thumbnails, resize, rotation, convert between file formats, contrast enhancement, filter and apply other digital image processing techniques etc. PIL supports image formats like PNG, JPEG, GIF, TIFF, BMP etc. It also possesses powerful image processing and graphics capabilities. To start with image processing first we need to download PIL and install in PC. PIL supports python version 2.1 to 2.7.

lily.jpg

One of the most important classes in PIL is image module. It contains an in-built function to perform operations like - load images, save, change format of image, and create new images. If your PC is ready with PIL, you can start your first program using PIL.

Let us open an image of water lily in Python. For this you need to import image class and can follow the command `Img = Image.open(lily.jpg')`. Make sure that your image and Python code are in the same folder. otherwise you need to specify the path of image file.

```
1 import Image                          ## to import Image
                                           class
2 Img = Image.open('lily.jpg')          ## to open image-
                                           lily.jpg
3 print Img.format,                     ## to print format,
  Img.size, Img.mode                       size mode
4 Img.show()                            ## to show image in
                                           your image viewer
```

With the help of Python modules Numpy and Scipy, Python competes with other similar platforms for image processing.

Now you can see image in your default image viewer. Here, the third line gives the format of image, size of image in pixels, and mode of the image (that is RGB or CYMK etc.).

Now to rotate the image by an angle, the following command can be used.

```
1 Img.rotate(45).show()          ## to rotate image
                                    by 45 degree
```

To convert and save a RGB image to greyscale, the following command can be used.

```
1 import Image
2 Img = Image.open('lily.jpg').convert('L')
3 Img.save('lily_greyscale.jpeg',"jpeg")
```

We may come across some situation to resize images, or create a thumbnail of some image. Let's see how this can be done using Python.

```
1 import Image
2 Img = Image.open('lily.jpg')
3 Img.thumbnail((128,128))
4 Img. save('lily_thumbnail.jpg',"JPEG")
```

lily_greyscale.jpg

To start with some image processing, let us make a 'negative' of the image 'lily'.

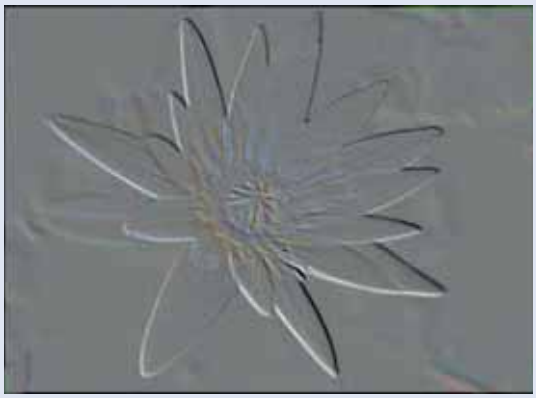
Neg_lily.jpg

lily.jpg' after applying the BLUR filter

Please try the following code. (For this you need to import two more libraries - ImageChops and ImageFilter)

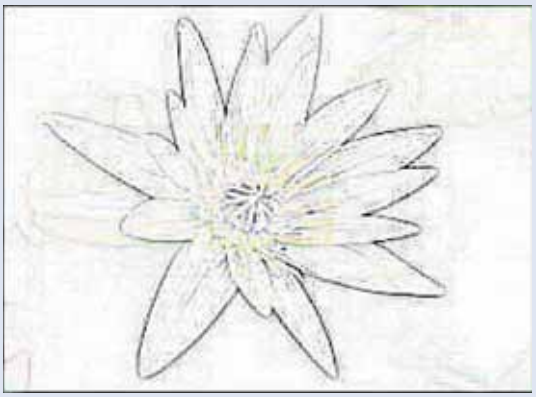
```
1 import Image
2 import ImageChops
3 import ImageFilter
4 Img = Image.open('lily.jpg')
5 ImgNeg_lily = ImageChops.invert(Img)
6 ImgNeg_lily.save('Neg_lily.jpg',"JPEG")
```

Now let us see some more filtering techniques that can be done by using Python in-built classes. For the following filters, first you need to import modules - `Image`, `ImageChops`, and `ImageFilter` as in the previous example. After opening the image in python, by ***'Image. open'*** method (line 4 in previous example), we can use different filters - BLUR filter, EMBOSS filter, CONTOUR filter, Find Edges Filter etc.

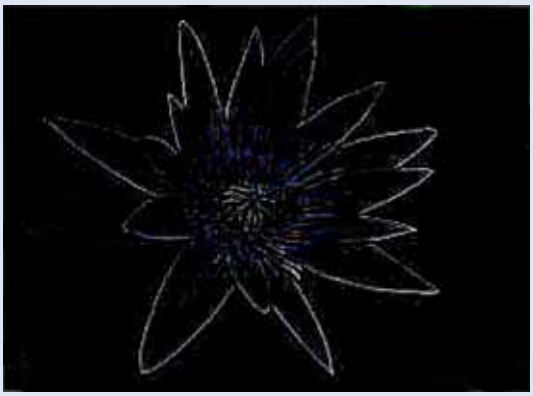


'lily.jpg' after applying the EMBOSS filter

```
***Use commands 1,2,3,4 in previous program
here***
ImBlur = Img.filter(ImageFilter.BLUR)
ImBlur.save('lily_BLUR.jpg',"JPEG")

***Use commands 1,2,3,4 in previous program
here***
ImEmb = Img.filter(ImageFilter.EMBOSS)
ImEmb.save('lily_EMBOSS.jpg',"JPEG")

***Use commands 1,2,3,4 in previous program
here***
ImContour = Img.filter(ImageFilter.CONTOUR)
ImContour.save('lily_CONTOUR.jpg',"JPEG")

***Use commands 1,2,3,4 in previous program
here***
ImEdges = Img.filter(ImageFilter.FIND_EDGES)
ImEdges = ImEdges.save('lily_FIND_EDGES.
jpg',"JPEG")
```



'lily.jpg' after applying the CONTOUR filter



'lily.jpg' after applying the FIND EDGES filter

You can convert an image into array for doing further operations, which can be used for applying mathematical techniques like Fourier Transform; the following code can be used.

```
1 import Image
2 import numpy
3 import scipy
4 pic = Image.open("lotus.jpg")
5 array = numpy.asarray(pic)
6 print array
```

In this issue, we had a bird's eye view of digital image processing using Python. There are many more exciting experiments that you can do with the image processing using Python. The power of Numpy and Scipy adds more advantages to image processing.

Dr. R M Sonar
Chief Editor, CSI Communications

Managing Technology »

Intelligent Systems and Applications in IT Management

Intelligent Systems?

Intelligent systems have been around since long, are applied in many domains, and typically fall under broader discipline of AI (artificial intelligence). AAAI.org[1] defines AI as *the scientific understanding of the mechanisms underlying thought and intelligent behaviour and their embodiment in machines.* Most of early applications of AI were based on technologies like expert systems. Expert systems represent and store expertise of domain experts in certain form, use and apply that expertise to solve a problem. AI especially in the context of business applications involves many techniques like artificial neural networks, fuzzy logic, genetic algorithms, case-based reasoning etc. Together these techniques address wide-variety of problems; they differ in the way they acquire, represent, store, retain, use, reuse and apply *knowledge* and solve problems. There are two basic forms of knowledge *explicit* and *tacit* as shown in table 1. The purpose of building intelligent systems using expert system and case-based reasoning technologies is to automate expertise to certain extent. Each technique requires knowledge to be represented in certain structured-form. However, techniques that are part of text mining and multi-media mining can deal with unstructured data and information sources.

The question is can machines be made intelligent using these two types of knowledge sources? Let us understand how human reasoning works. As illustrated in figure 2(a), whenever we encounter a problem or opportunity, we recall past experiences and see the possibility of reusing the most relevant experience(s) in the current problem context. As shown in figure 2(a), these experiences remain in tacit form. Can they be embodied into machine so that machine can reason the same way as we do? Let us look at three basic ways of doing it, may be asking questions:

1) Can these experiences be represented and stored in an explicit form so that machines understand them, *retrieve* the most similar experience(s) *matching* with current problem and *reuse* them to arrive at a solution to the problem as shown in figure 2(b)?
2) Can these experiences be represented and stored in an explicit form so that machines *learn* from these experiences with some machine learning technique, and use that *learning* to solve current problem as shown in figure 2(c)?
3) If experiences are not available in explicit form, can expertise of domain experts be extracted, represented and stored in a form machine can directly use and apply that expertise to solve current problem as shown in figure 2(d)?

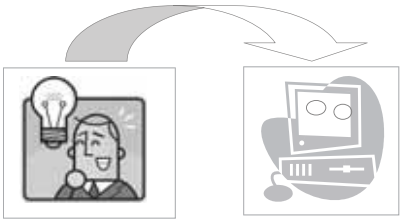


Fig. 1: Making machine intelligent by embodying intelligence

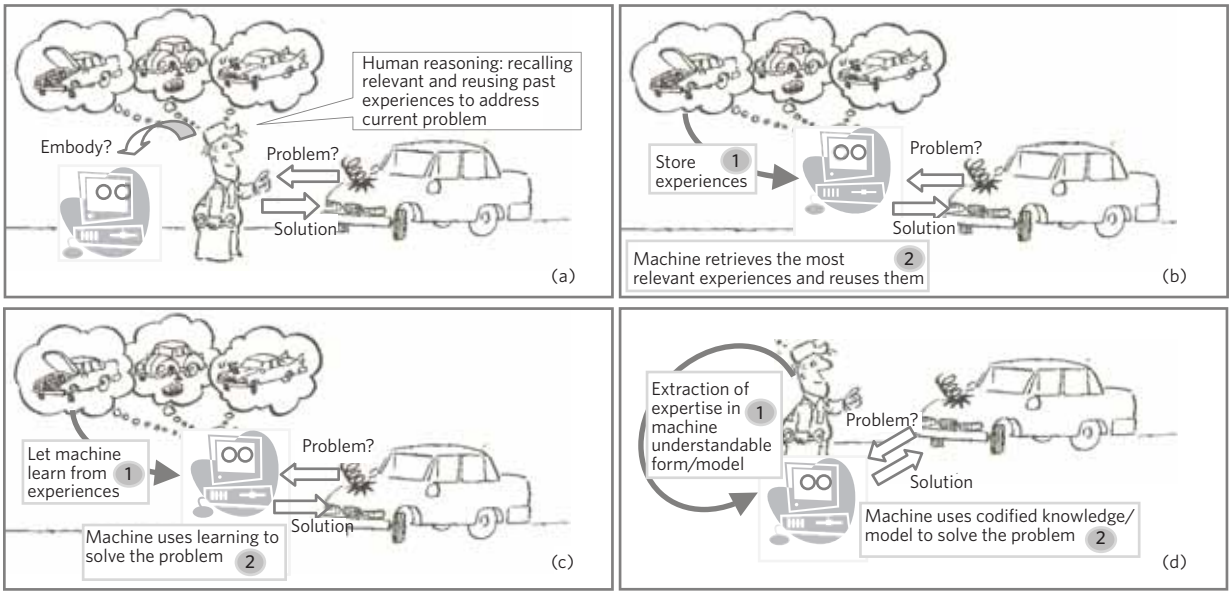


Fig. 2: Human reasoning and ways to make machine intelligence (basic figure modified from source[2])

Knowledge forms (experiences)	Description
Explicit	Expressed in some explicit or implicit form especially documented form (structured, semi-structured, unstructured): past solved problems, manuals, models, etc.
Tacit	Remains inside individual's brain

Table I: Basic knowledge types

These three examples illustrate the underlying principles of three kinds of intelligent techniques. The approach illustrated in figure 2(b) represents techniques like *case-based reasoning* (CBR) where a problem (new case) is solved by retrieving most relevant problems (matching cases) amongst the past solved ones (case base: past cases) and reusing their solutions in the current context; figure 2(c) represents the machine learning techniques like *artificial neural networks,* they learn from past examples; and use that learnt knowledge to solve given problem; and figure 2(d) represents technologies like *expert systems* where expert knowledge is *elicited* and presented in form like decision trees or IF condition(s) THEN action(s) rules called knowledge-base, this knowledge-base is used to solve new problem. Some intelligent techniques value-add or improve other techniques like fuzzy logic: instead of writing rules in expert systems in if-then-else form using simple comparison operators like less than, greater than (for example: *if CPU usage >=90%* and *Physical memory available <= 10%* then *send alert 'Do not start new application'*), they can be written as fuzzy rules (for example, *if CPU usage is very high* and *physical memory available is very low* then *send alert 'Do not start new application'*) called as fuzzy expert systems.

Experiences can vary depending upon the problem domain or problem itself. An experience can be: an evaluation of credit card application, an execution of a project, a failure of equipment, a fraudulent online transaction, an individual customer's buying and spending, a loyal customer profile, a churned customer profile etc. In an abstract sense, employee-, customer-, product- and service-profiles can also be called experiences. For example, a customer profile may represent what kind of customer he or she is, what he or she does or likes etc. More the experiences that are available and stored in structured and meaningful form, more useful they are when it comes to building intelligent systems. This is similar to the way humans understand some forms of knowledge (like videos) more quickly as compared to other forms (such as descriptive texts). However, most of the time this is not the situation, since experiences are available in unstructured form (e.g. IT support vendors maintain physical records of client complaint calls, engineers do not write the details of how they addressed the issue, and if they do, most of the time it is hand-written). The firms need to convert these physical records into databases and subsequently need to follow practice of capturing the details (from client support call till resolution) in electronic form in order to automate reuse using intelligent systems.

Intelligent Systems in Managing IT

There are many activities that are part of managing information technology, which require substantial knowledge about various technologies and human expertise. For example, procuring software itself is one of the complex decision-making tasks. Typical questions that the decision maker may have in mind: (a) how can I get the software that takes care of all my functional and technical requirements?; (b) will it fit into, complement and be compatible with my existing IT setup or will I need to incur extra cost to procure additional required resources?; (c) what licensing policies does the vendor follow, what is the best that suits to my requirements?; (d) does the software and the vendor follow standard and best industry practices?; (e) is the vendor reputed?, does the vendor have enough capability?, will the vendor support me whenever my users face issues and need modifications?; (f) do I have required manpower to use the software or do I need to hire?, what kind of training and skill-sets will be required to use and manage the software?; (g) what is my TOC (total cost of ownership)?. Complexity in evaluation and selection process increases because of[3,4]:

- Large number of software products available in the market, continual advancements and improvements in information technology
- Existence of incompatibilities between various hardware and software systems
- Difficulty in assessing functional dissimilarities of various software packages
- Lack of technical knowledge and experience of software selection
- Changing user requirements of the software packages
- Existence of several constraints while choosing the best alternative
- Lack of structured description of features and user requirements of of the software package.

In general, major challenges involved in managing IT are: coping with rapid changes in technologies; procuring, supporting and managing many heterogeneous technologies and vendors; hiring and retaining IT skills; and ensuring compliance, security and ethical use of IT resources. Although IT management activities can be classified into several groups, based on similarity in tasks they are grouped into three broader groups to understand scope of intelligent techniques.

1. IT procurement
2. IT set-up/ infrastructure management
3. Managing IT expertise

IT Procurement

Intelligent techniques especially expert system and case-based reasoning have played major role facilitating software evaluation and selection tasks[5]. Use of a generic list (taxonomy) of software evaluation criteria along with its meaning and associated scales, measures (metrics), importance and priorities are essential for assessment of the software packages. Many a time except *functional* evaluation criteria, which vary from one functional area (e.g. accounting) to another (e.g. payroll), the other evaluation criteria such as *technical details* (like operating systems, hardware resources, standards used, input and output formats), *vendor details* (like reputation, availability of technical manpower, support and upgrade capabilities, feedback from existing clients), and *quality specific details* (like portability, maintainability, usability, reliability, efficiency), can be *standardized* (by creating feature vocabulary, using taxonomy or grouping various criteria,

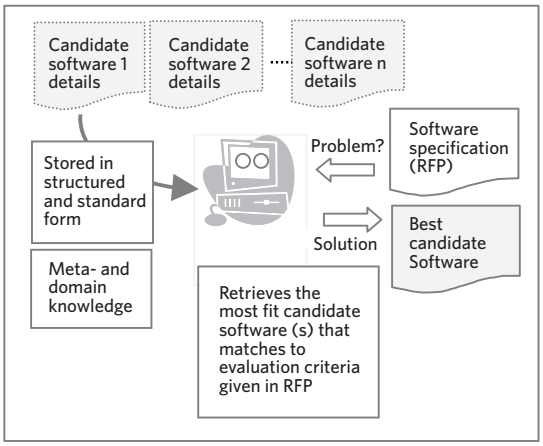


Fig. 3: Selection of software using CBR approach

using appropriate scales, measures, etc.). Based on requirement, the relevant evaluation criteria can be incorporated while preparing the standard RFP (request for proposal template), and vendors can be asked to provide the details in standard RFP template form.

Firms prepare and manage such RFP templates in spreadsheets/word processing formats, however, if they are made available online using web templates, the vendors can fill the relevant details more accurately within possible options available. Vendor responses (candidate softwares) become experiences (knowledge about individual software). Standard RFP specification can be intelligently matched against the candidate softwares and final scores can be arrived for each one using case-based reasoning approach and subsequently ranked. In case-based reasoning, domain knowledge plays very crucial role to retrieve most similar experiences by matching current problem with past experiences especially at feature level. For example, if software is portable (feature portability will have value 'yes') means it can work on many operating systems, etc. Figure 3 shows how case-based reasoning approach is used for software selection.

IT Infrastructure/Setup Management

Large firms have huge IT resources (large numbers of servers, desktops, storage devices, networks etc.) Various activities and performance need to be monitored on an on-going basis; and troubleshooting and finding root causes in case of failures; detecting abnormal behaviours, predicting and preventing downtimes; upon failure reduce time to repair or make systems up again; optimizing resources are some of the major tasks. Many systems and applications are configured to send alerts in case usage exceeds set thresholds, to create and keep logs. Intelligent techniques have been used to address first call resolution, self-service, technical help-desks and troubleshooting applications to improve the productivity and reduce the support cost[2,6]. They are also deployed to analyse various logs, alerts generated by the IT resources to detect anomalies or predict likely failures. Failure experiences can be stored in the form of 'what is failure' and 'what are the things that caused or lead to fail: e.g. logs of various events before failure'. These experiences can be reused to get early warning signals of likely failures and what are the preventive steps or measures to be followed to stop or prevent failures. Rule-based expert systems can be deployed by writing rules that interpret various logs, events and usage, and send alerts. Such intelligence can be embedded into IT resources themselves to help the systems to stop failures or recover/heal themselves upon failures (autonomic computing).

Intelligent systems have also been applied in securing IT systems such as neural network and rule-based expert system based intruder detection systems (IDS)[7].

Managing IT Expertise

Software project management, support and administration of various applications and systems require different kind of skills sets. In large size firms, pulling or hiring the right resource person is important based on the job profile. Same as that of software specification if the job profiles and employee skill-sets are specified in standard form using various criteria, matching job profiles with required job profile becomes easier. Right employee profile for right job improves productivity and employee satisfaction. Domain knowledge about various skill set is essential, for example, if a software engineer who has worked on C++ programming, can he or she work on project that involves C coding?

Many firms who are involved in IT services or have in-house software development have lot of expertise available. Many a time firms go through entire SDLC (software development life cycle), use various CASE (computer aided software engineering) tools and meticulously follow structured analysis, design and coding methodologies and approaches. UML (unified modelling language) facilitates tools, techniques and methodologies to develop software using object-oriented approach. Lot of software code is written in modular way, broken into reusable APIs (application programming interface), web services or in the form of libraries etc. Apart from software development, IT professionals possess knowledge about initiating and negotiating projects with clients, understanding requirements, executing projects and supporting projects, dealing with client team, best industry practices, etc. Intelligent techniques help to automate, retrieve and reuse such expertise required at various levels[8] e.g. (a) reuse of existing 'customer' class in the class diagram developed for one application in other application, (b) reuse of experiences of managing various ERP projects to estimate efforts required, do proper requirement analysis, and planning execution for new ERP projects, (c) reuse of API to develop a new application or as a part (composition) of new functionality. However, in order to develop intelligent systems to facilitate extensive reuse, experiences need to be properly structured and stored, for example, every API should have details like what input parameters it takes, purpose and data types of parameters, what it returns, programming language it is implemented, functionality of API, relationship with other APIs (whether it uses other APIs or part of other API etc.), detail categorization of API into using, etc.

Bottom Line

Intelligent systems have been around and increasingly found addressing serious business applications. Intelligent systems automate knowledge tasks, retain and reuse valuable expertise so surely would find utility in the firms in IT management. Some of these techniques are already part of knowledge management and business intelligence (especially predictive modelling) tools and technologies. More automation of various manual infrastructure operations, use of sensor technologies, complexity of managing so many technologies, availability of millions of logs/events in structured forms, and move towards reduction in TOC would get a push and make such systems applicable,

Continued on Page 30

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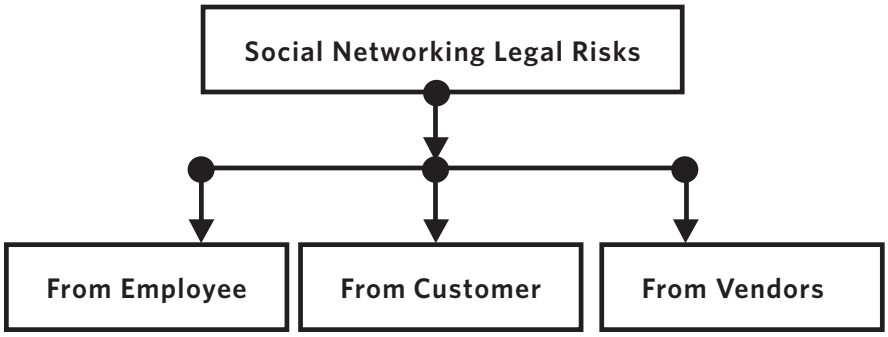
Information Security »

Social Networking Sites - Risks to Organizations



On the advent of this furor over Facebook comments and the dirty politics played by leading social networking companies by befriending print & television media, I thought apt to write this article on social media risks to organizations.

Illustration 1: Here we were in thick of matters defending our client at very senior level in the management who was denied legitimate promotion; the reason cited was strenuous and imbalance family relations and reasons for this conclusion was, the only young daughter of this corporate honcho was updating her Facebook page about the fights her parents had in the night on various issues regularly.

Illustration 2: We had a hell of a time helping this USA-returned MIT Graduate lady working for an investment banker, when her estranged husband in the USA actually made a website by her name, i.e. www.firstnamesurname.com, hosting all defamatory and malice stories about her illicit affair and warning prospective employers not to employ her.

Illustration 3: One psychic and religious fanatic was found defaming a Hindu guru left and right by addressing his name with menacing words. This guru did come to know but nor prior to his followers and conspiracy between them led to further tug-of-war. The cream of this story is this religious fanatic wrote all this crap sitting in his office computer with office ip address.

As more and more people meander their lives online, sites like Facebook, Twitter, YouTube, LinkedIn, and MySpace have become a digital treasure trove for incriminating photos and online admissions that undermine a claimant's case. Social Networking websites have become not just a place to share our personal lives. Many organizations use social networking websites to promote their business, communicate with customers, and recruit or check-up on employees. However, most businesses don't think about the legal risks and issues that may result from such use. The following are a few legal risks that you should consider when you or your employees are using social media to promote your business.

The Risks come from:

1. Employee: The key to mitigating the risks of social media is real-time, constant, and consistent monitoring of the main platforms. You need to be monitoring, because if you don't know what's going on, you can't hold your employees accountable. And if an employee is being negative about his or her employer on social media, it can be construed as grounds for dismissal of cases. Aside from stringent monitoring on what third parties are saying, employers need to be conscious that improper use of social media by employees can leave them open to sexual harassment legal actions - even if posts are made outside working hours. Companies have to understand that social media is a very public medium and that what's said on social media platforms is permanent. Smart companies educate their staff about this and once people understand that, there's usually a shift in the way it's used. Some ways that social media can damage reputations or lead to leaks are obvious, such as disgruntled or careless employees blurting out negative information or company secrets. Employees may also unwittingly disclose company information while, ironically, trying to do a better job.

   a. Current employee
   b. Disgruntled employee
   c. Children or relatives of employee
   d. Suspended/terminated/employee
   e. Ex-employee

2. Customer: The consumer product executives recognize that using social media for marketing to consumers puts them at risk of unintentional damage to their reputations. That's what happened to McDonald's and Qantas. Both companies invited followers on Twitter to share their positive experiences: McDonald's about healthy ingredients in their food and Qantas about the ideal luxury in-flight experience. Instead, both companies got a Twitter full of complaints. The same thing happened with Mumbai traffic police. Instead of sharing traffic-related situation people shared pictures of traffic cops taking bribe.

   a. Financial issues
   b. Quality issues
   c. Service issues
   d. Sponsored by competitor

3. Vendor: Cost-cutting vendors are at risk of "losing their audience" with channel partners due to an over-reliance on social media as a means of communicating. Social media has offered an easy way for interaction between companies operating in the channel, as well as offering a way for channel firms to promote themselves to customers. However, research has shown that very few channel companies have taken well to social media as a means of communicating with vendors - with only 10% rating this as an effective means of communication. Fifty-three percent however said that one-to-one meetings were one of the most effective means of communicating, rather than Facebook or Twitter. Vendors need to rethink social media

channel communication strategies, or risk alienating reseller partners.

Some of the feedback has been that taking away or cutting back on traditional methods and hoping that social media is going not to fill the gap that is not always going to work for resellers. While social networking offers many benefits in terms of ease of communication, that many are still coming to terms with best practice.

My personal impression is that people are still trying things and seeing what will work. It will take another year before vendors work out where it does have a role and where they should be using the more traditional communications methods. However, it is also seen as a cost-cutting tool.

Other Legal Risks that Affect Your Organization

1. ***Intellectual Property (IPR)***. While posting content or logos that infringe on the intellectual property rights of another is easy to envision, can you really defame someone in 140 characters or less on Twitter? One should be also careful about using content created by others. Although you may comment on content, there is risk when using content created by others to promote your business without their permission. In addition, using another person's likeness (i.e. picture) without permission can violate a person's copyright or right of privacy. This may seem basic, but the speed at which posts occur on Twitter, Facebook, Youtube, and other platforms can result in not fully analyzing the use before it's posted. For example, if a customer posts a positive review on Facebook or Twitter and you copy that post to your website to use as a testimonial for your product, you run the risk that the customer's right of privacy has been violated. You should seek permission from that customer to avoid possible legal liability for using their name, likeness, and content. On websites and blogs, you can subject the users to your terms and conditions, which should include provisions to grant you the right to use any content posted to your website or blog for promotional purposes.
2. ***Reviews.*** Whatever the platform, you should be careful when describing your products or services to make sure that the descriptions are truthful. Any false or misleading statements about your products or services can create liability. Opinions are acceptable - such as, "this is the best mattress on the market" - but claims about features or other specifics should be carefully reviewed. In addition, you may be sued for false advertising or unfair competition if you pay for reviews, provide a product for free in exchange for a review, or there is some other relationship between the reviewer and the company, and you do not disclose that information. If there is any relationship to the company by someone speaking publicly about your business in social media or on your website, that relationship should be clearly stated.
3. ***Cyber Defamation.*** In addition to speaking truthfully about your product or service, you must speak truthfully about your competitor's products or services. Any false claims that could harm the reputation of your competitor or one of their employees may result in a claim for defamation. Care should be taken when comparing your product to your competitors to assure that all claims, advantages, disadvantages, or other information stated about the competitor's product is accurate. In addition, you should keep any evidence relating to the claims you made just in case you need to defend a claim for defamation.
4. ***Agreements on Social Networking Sites.*** You should be aware that Facebook, Twitter, Youtube, Linkedin and others have their own terms and conditions that must be followed, particularly as they relate to advertising on their platforms. You should make sure that you follow those requirements to avoid your advertisements or your entire account being removed from their platform and potential legal liability for your actions. Social media sites can be a great way to stay in front of your customers at a low cost, so losing the privilege of using it can be a major blow to your company's promotional plans.
5. ***Account Ownership.*** There have been many cases dealing with who actually owns the rights to a social media account. If the company has control over access and requires the employees to post on their Twitter, Facebook, or Linkedin account, should the company have some ownership interest in the account? Wouldn't the company like to have access to those followers and control of what content comes from that account after the employee leaves? In India, the courts have not yet made a decision on what criteria would give rise to an ownership interest by an employer of a social media account, but you should be aware of this issue and try to take steps to protect your interests. If you would like to control an account that is set-up purely for business or that your employees set-up for promoting your business, your employee handbook or Internet policy should include terms that transfer rights to the company or terms that protect against disparagement through such accounts during employment and after the employee leaves.

Conclusion

Using social networking sites like Facebook, Linkedin etc. for promotional purposes for your business can be very beneficial to your brand, but it can also lead to legal liabilities if a systematic approach is not applied or reasonable security practices are not followed. You should devise a plan with the above legal risks in mind and discuss these issues with your employees and partners to assure that everyone is aware of what is acceptable. In some cases, it may slow down the speed at which promotions are created and executed through social media, but it will help to protect the business against making a costly mistake that causes both legal liability and reputation problems throughout your social network. Social networking sites are here to stay and it represents a paradigm shift in how people communicate and share information. While this digital age has given risk management and claims professionals a treasure trove of information to be mined in defending all kinds of cases, it is also proving to be a breeding ground for compensation claims and causes of action that were unimaginable only a few years ago. Who knows when Facebook would be declared a country with its own courts to settle such the disputes till then acknowledging and abiding law of the land will definitely help.

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IT Act 2000 »

Prof. IT Law in Conversation with Mr. IT Executive - AIR in e-Commerce Issue No. 9

IT Executive: Hi Prof. IT Law! In our last session you talked to me about digital signatures. I can see that electronic and digital signatures are valuable in online transactions.

Prof. IT Law: Yes. But are you aware of the three major challenges of electronic commerce that electronic and digital signatures address?

IT Executive: No I don't. Please tell me about the three challenges.

Prof. IT Law: Firstly, electronic commerce or e-commerce presents a challenge of "authenticity". In the "real" world, you meet the other party to a transaction and you know his or her identity either directly or through an agent or affiliate. So, you actually know who the other party is and can rely on his "identity".

IT Executive: Are you saying that I know [or can verify] that the other party is actually who he or she says he or she is?

Prof. IT Law: Exactly. But doing the same thing in online transactions or in e-commerce is much more difficult. How will you actually know whether the other party to a transaction with you is actually who he or she claims to be?

IT Executive: Are you saying that imposters can easily fool us on the Internet?

Prof. IT Law: Yes. And that is called the "authenticity" challenge. In other words the challenge is to verify the authenticity of the other party to a transaction with us.

IT Executive: And how do digital signatures address this challenge?

Prof. IT Law: Digital signatures are issued to parties after verifying their identities. And these identities are revealed in the Digital Signature Certificates that are issued to such parties - which you can verify online when you look for the other party's public key.

IT Executive: And the second challenge?

Prof. IT Law: The second challenge is the "integrity" challenge. This challenge is about the integrity of the electronic mails or messages exchanged in the course of e-commerce.

IT Executive: Meaning thereby that you want to know whether the mails or electronic messages exchanged have been tampered with during transmission?

Prof. IT Law: Precisely. And when you use a digital signature, any alternation will result in the failure of the decryption or decoding process even when you use the public key matching the private key that was used to encrypt or encode the message. That will alert you to any tampering with or alteration of the electronic message in the course of e-commerce.

IT Executive: I see. And the third challenge?

Prof. IT Law: The third challenge is that of "non-repudiation". What does this mean? This means that any one who engages in e-commerce should not be allowed to wrongfully "repudiate" or reject, deny, refuse, disclaim or otherwise wash his hands off a transaction by claiming that he had not actually sent the electronic message that was sent under his digital signature.

IT Executive: So how does a digital signature help in such a situation?

Prof. IT Law: Well, a digital signature is not easily usable by some unauthorized third party because only the owner of it has the private key. So it is very difficult for him to claim that someone else used his digital signature without authorization.

IT Executive: I understand. So those are the three challenges of e-commerce!

Prof. IT Law: Yes and these are the ways in which digital signatures address such challenges.

IT Executive: Thank you Prof I T Law. This has been very useful to me.

Prof IT Law: I am glad you found this talk useful. Bye for now. ■

Continued from Page 27

feasible, effective and practical rather than remaining just academic research attempts or lab prototypes. Attempts are being made by the industry such as developing self-managing systems (autonomic computing).

However there are many challenges in general: there are lot of existing unstructured data, information and knowledge sources, a big task of converting these in structured form, capturing physical knowledge sources into electronic forms; complexity of modelling domain knowledge (like taxonomies, ontologies); defining and enforcing standards while creating and documenting experiences, adding meta-data to experiences; availability of expertise to model problems, develop and deploy intelligent systems; people willingness to share their experiences and so on.

With the advent of technologies like automated document classification, text and multimedia mining, NLP (natural language processing), ICR (intelligent character recognition), use of standards, CASE tools, some the challenges can be addressed to some extent.

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Computers in the Indian Police

An interesting chapter in the history of computers in India is their entry in the Police, going back, believe it or not, to the year 1969. The earliest entry was perhaps, in the Border Security Force when the payroll of that force was computerized by its far-sighted founder-Director-General, K.F.Rustamji. The first entry for the professional role of the police, viz. the prevention and detection of crime, in which I had a role, was in 1971 in Tamilnadu State.

This pioneering effort got really started in 1969 when I was working as DIG in charge of Railways & the Armed Police in Tamilnadu. At that time I started taking interest in computers and in studying its possibilities for their use in Police work. A fortuitous event at that time was the introduction of computerization of the State Government's Budget initiated by that far-seeing Finance Secretary, S.Venkitaramanan, who was later to become Finance Secretary of the Government of India. When he set up the Tamilnadu Government's Data Centre for this purpose, he readily accepted my proposal to initiate police use of its computer facilities for the prevention and detection of crime. And he went on to include me in the team that was to undergo training with IBM which had been commissioned to set up an IBM 1440 Computer in the Government Data Centre.

This training equipped me to design a full-fledged Computerized Crime-Criminal Record System based on my extensive field experience in the handling of crime. I designed a set of ten 80-column card formats in which the full profile of each crime and criminal could be captured for input to the computer. I also designed a full set of codes in which these data elements could be encoded for computer processing. I also remitted all these design details to the Bureau of Police Research & Development, Government of India, to be placed before the next Annual Conference of DIGs-CID for approval and adoption in all States in due course. Meanwhile the Government of Tamilnadu gave sanction for a Police Data Entry Section with a full complement of Punch Card & Verifier machines and an Accounting machine which were acquired from IBM, Sanction was also accorded for a team of constables to be trained and to operate these machines, to capture the input data on punch cards for computer processing.

All the instructions were compiled as a Computer Code Manual which was distributed to all Police Stations. The basic data was to be obtained from registers covering a 10 year period from over 800 Police Stations of the State, An educated constable was earmarked in each Police Station and trained to enter the data from the registers along with the prescribed codes, on to printed input forms. These forms were then required to be sent to the Data Entry Centre at Chennai for being entered into punch cards.. Each Police Station was required to send one year's back data so compiled at monthly intervals so that the buildup of the 10 year back data from all Police stations was completed in one year by the end of 1974. That the buildup of the entire data bank data was thus accomplished by just plain police constables in just one year and with remarkable accuracy, was surely an incredible achievement that people today would scarcely believe.

An interesting aspect of the computer operation was that when a new crime was reported, all data of earlier similar crimes in that locality had to be retrieved from the data bank and made available to aid in the further investigation. The data bank had now reached a size of nearly 200 Megabytes, and this operation required a computer with Hard Disks, capable of random access into this data bank. But the IBM 1440 computer now with the Government Data Centre supported a couple of Hard Disks with a capacity of just 2 Megabytes !. A fortuitous development at this point of time was that the Indian Institute of Technology, Madras had just received their first IBM 370 Mainframe which could support Hard Disks of 200 Megabytes capacity. When I explained this to the Finance Secretary, he readily sanctioned the shift of the Police project to the IIT facility. With a quick development of the software in the PL-1 language, we had the satisfaction of the project becoming fully operational by early 1975. Thus Tamilnadu became the first State to commission a full Computerized Crime-Criminal Record System in India. It was

matter of great satisfaction to have a visit to our Computer facility on the 20th April, 1975 by Jean Nepote, the Secretary-General of Interpol, as seen in the photo below. What was even more interesting was his confession at that visit that Interpol still did not have a comparable facility!

A brief epilogue would be appropriate at this point of the story. When he heard that our computer project was now operational, the news went to Rustamji, who had since retired from the BSF. He had now become Special Secretary in the Home Ministry, and in this new capacity, decided that the Tamilnadu project should be replicated in all States as part of the Police Modernization Programme of the Government of India. With import of computers being ruled out, he thought we should explore the possibility of a indigenous production of computers by Electronics Corporation of India. He then asked me to join and assist him for a discussion with ECIL at Hyderabad. We were also joined there by T.Anantachari, a DIG from BSF, who later rose to become its Director General.. At the meeting Rustamji prevailed on ECIL to push their TDC-16 computer which was still on their drawing board, into production. He also placed an order for 10 of these units to be supplied to the large States, the first being earmarked for Tamilnadu. Anantachari was then asked to coordinate this as a national project and was soon thereafter formally appointed as Director of Coordination, Police Computers in the Home Ministry. This move later led to the establishment of the National Crime Records Bureau and State Crime Bureaux in all States and the establishment under them of a national network of Police Computers. ■

About the Author

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Brain Teaser

Dr. Debasish Jana
Editor, CSI Communications

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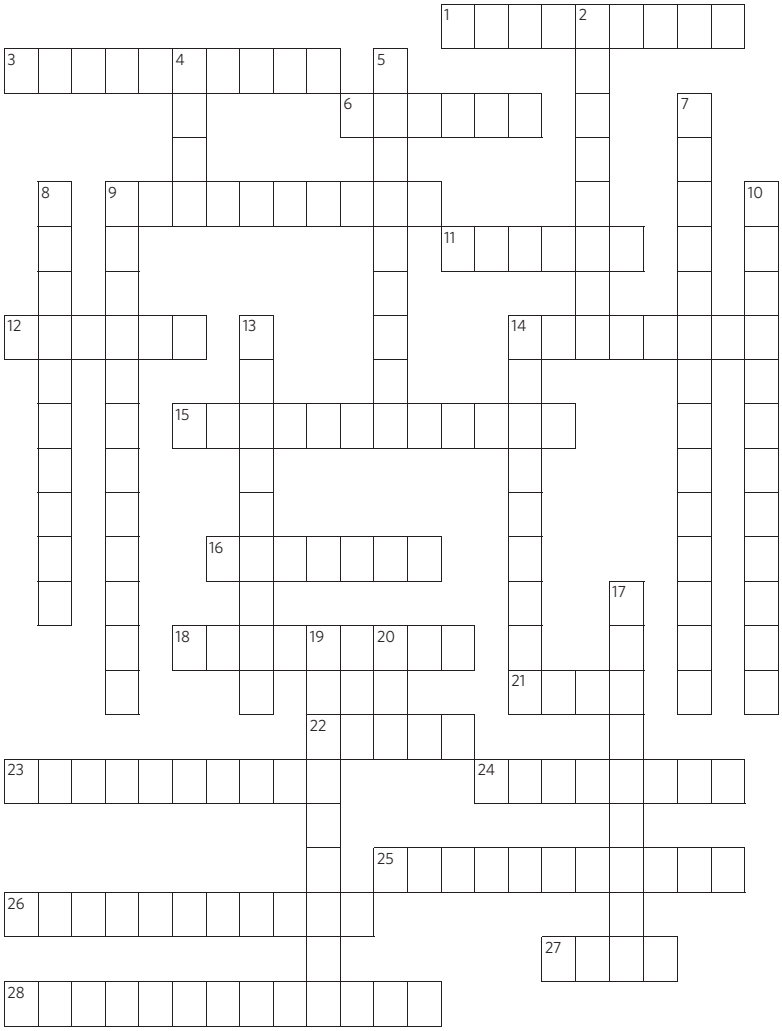

CLUES

ACROSS

1. Probabilistic optimization algorithm technique for solving computational problems (3,6)
3. A form of multi-valued probabilistic approximation technique (5,5)
6. Type of networks using machine learning technique modeled like neurons (6)
9. A tree traversal technique (5,5)
11. A logic programming language (6)
12. To arrive at by reasoning (6)
14. A computational learning technique to find patterns in data (8)
15. A systematic collection of facts, inference rules, and associated procedures organized into schemas (12)
16. Type of a probabilistic search algorithm imitating natural evolution (7)
18. A type of psychology that explores internal processes within mind (9)
21. A local search method used for mathematical optimization (4)
22. A knowledge representation technique (5)
23. A boolean algebra-based table used in logic (5,5)
24. A representation of state-transition system (8)
25. Processed data (11)
26. An inference rule type (5,6)
27. Something that is true (4)
28. Knowledge about knowledge (13)

DOWN

2. A specification of a conceptualization (8)
4. A pioneering language used in artificial intelligence (4)
5. Process of thinking, assimilating, and forming judgments (9)
7. A technique to add new items to known groups (14)
8. Type of machine learning to infer a function from labeled training data (10)
9. A graphical representation of a hierarchical set of rules (8,4)
10. The man who coined the term "Artificial Intelligence" (4,8)
13. Information and skills acquired through education or experience (9)
14. A probabilistic search technique (4,5)
17. Rule of thumb (9)
19. Act or process of deriving logical conclusions (9)
20. Relationship between an object and a type (3)

Did you know Particle Swarm Intelligence?

Have you ever noticed a flock of birds or a collection of fish moving together? This population-based global stochastic optimisation technique was originally developed by Dr. Eberhart and Dr. Kennedy in 1995, when they got enthused seeing the social characteristics of a group of birds or fishes. The potential solutions, called *particles*, emerged through the problem space by following the particles acting at current optimum level according to some criteria of fitness.

For example, if we closely watch a flock of birds, we can try to find out an answer to why they flock together. Reasons could be to take advantage of the same food supplies by many, to get help in locating or protecting from predators, to take advantage of aerodynamics in a synchronized way and many others. While doing all these things, they try to maintain an optimum distance between themselves and their neighbours to prevent collisions. Eventually an optimum solution is reached through mutual cooperation and coordination. No wonder, there are so many little wonders of nature for us to learn from.

Dr. Debasish Jana
Editor, CSI Communications

Your Question, Our Answer

"You must continue to gain expertise, but avoid thinking like an expert." ***- Denis Waitley***

[CSIC Editorial Team would like to thank Mr. Himanshu B Dave for sending valuable feedback about the AAE column that first appeared in October 2012 CSIC issue and subsequent clarification by Editors published in November 2012. His further thoughts are produced below for reference.]

From:
Himanshu B Dave
Ex. Professor of Computer Engg, IIT/Kharagpur,
L. D. College of Engineering, Ahmedabad,
D.D.I.T, Nadiad
Senior Consultant (Training),
eInfochips, Ahmedabad

Thank you for including my letter regarding the article "Ask an Expert", CSI Communications, Oct. 2012.

Unfortunately, I find that the demo program, supposedly supporting the three methods for the "Odd/Even" problem itself is misleading. It tests only one number (2^{24}, which is of course even). The same program run with $2^{24} + 1 = 16777217$ gives wrong answer for the first two approaches, as I had stated in my communication. Please see below:

```
#include <stdio.h>
int main(){
 int numToTest = 16777217; // 2^24 + 1
 // approach (i)
 printf("Testing %d with approach (i)\n",
        numToTest);
 int a;
 float b, no = numToTest;
 a = no/2;
 b = no/2;
 if(a == b){
  printf("%d is an even number\n", (int)no);
 } else {
    printf("%d is an odd number\n", (int)no);
 }

 // approach (ii)
 printf("Testing %d with approach (ii)\n",
        numToTest);
 float no1 = numToTest, no2, no3;
 no2 = no1/2;
 no3 = no2 - (int)no2;
 if(no3 > 0){
  printf("%d is an odd number\n", (int)no1);
 } else {
  printf("%d is an even number\n", (int)no1);
 }
 // approach (iii)
 printf("Testing %d with approach (iii)\n",
        numToTest);
 int x = numToTest;
 if(x & 1){
  printf("%d is an odd number\n", x);
 } else {
   printf("%d is an even number\n", x);
 }
}
```

The output is as below:

```
hbd@laptop:~$./odd_even
Testing 16777217 with approach (i)
16777216 is an even number
Testing 16777217 with approach (ii)
16777216 is an even number
Testing 16777217 with approach (iii)
16777217 is an odd number
```

The reason why the first two methods do not work is indicated by outputs, which show that

16777217 gets treated like 16777216.

The long explanation about floating point representation etc., given by Dr. Jana, as an answer to the issue I had raised, itself shows why the first two methods would not work in general.

However, I do hope that my main contention is not overshadowed by all these - emphasize clearly written code, the kind of "expertise" displayed is not appreciated in real life programming. We should convey to our students and budding engineers good engineering practice. I submit so, especially because the Chief Editor says that " ... we take pride in this column where we try to provide some guidance based on our expertise". Fun has its place, but you have to be serious some times.

I hope you will publish this in the next issue of CSI Communications.

-- H B Dave

[CSIC Editorial Team sincerely thanks and reassures quality checks to the extent possible.]

This month's Question on Empty Class or Struct in C++

Q What is the size of an object of an empty class or empty struct in C++? What is the use of empty class or struct having no element?

Anonymous

A Let's take the following code snippet to illustrate.

```
#include <stdio.h>
struct EmptyClass {};
int main() {
 EmptyClass e;
 printf("size of obj of empty class: %d\n",
        sizeof(e) );
  return 0;
}
Output: size of obj of empty class: 1
```

Here (in C++ example), EmptyClass is a struct (same as class) having no element. So, ideally, the size of the object of this class (e, in this example) should be zero. But, each object needs to have a non-identical storage address and therefore this object e must be located in a unique address. If the size is zero, then another object or data would also occupy the same space. As such, the minimum size that will be considered by all compilers is one byte, irrespective of size of machine word, 16, 32 or 64 bits, whatsoever. This is mandated by C++ standard. However, if the class has a virtual function, like the following version, the size of object of empty class would be 4 for 32-bit machine architecture.

```
#include <stdio.h>
struct EmptyClass {
 public:
  virtual void vf(){};
};
int main() {
 EmptyClass e;
 printf("size of obj of empty class: %d\n",
        sizeof(e) );
  return 0;
}
Output: size of obj of empty class: 4
```

Here, because of the virtual function, the object will have a pointer to the virtual function table, and that pointer requires four bytes of storage on 32-bit machine. Since that is non-zero, the earlier logic of padding one byte is not required. Thus, the size will be 4, not 4+1=5 (in 32-bit machine).

Empty class or struct is advantageous when the class has no data members but has some virtual functions (may be pure ones) that may be overridden in derived classes. For example, a storage base class may have no members but there could be virtual functions to iterate through the storage class. This helps to override these functions having specified signature in the subclasses. We can use empty class with no data members and only virtual functions to implement Java-like interfaces. In Java, we can define interface which then needs to be implemented in classes. Since C++ does not have such a structure, empty class with virtual functions can serve equivalent purpose. Even without virtual function, empty class without any member can be a placeholder to have a common base class to treat multiple derived classes as a common type.

Send your questions to ***CSI Communications*** *with subject line 'Ask an Expert' at email address csic@csi-india.org*

H R Mohan
AVP (Systems), *The Hindu*, Chennai
Email: hrmohan.csi@gmail.com

ICT News Briefs in November 2012

The following are the ICT news and headlines of interest in November 2012. They have been compiled from various news & Internet sources including the dailies - The Hindu, Business Line, and *Economic Times*.

Voices & Views

- Public cloud services cannibalize, stimulate demand for IT services spend - Gartner.
- Sunny Leone is cyber criminals' hot pick to lure victims. She pushed Katrina Kaif to the second slot. Salman Khan is the lone male star to find a place in the 'Most Dangerous Celebrity in Indian Cyberspace' - McAfee.
- Apple is the most innovative company in the world in 2011. Google and 3M ranked second and third - Survey by Booz & Co.
- Global sales of tablet computers to surge to 126.6 million in 2012 - Consumer Electronics Association.
- Start-ups based on mobile, cloud tech poised to grow. With $2-3 billion of venture capital available for start-ups, the main impediment is the lack of innovation - Kaushik Thakkar, a Silicon Valley-based serial entrepreneur.
- 58% of Gen Z favor surfing Internet on a mobile phone than watch TV - Survey by Ericsson.
- 'Obama's re-election not best news for IT outsourcing industry' - CEO of iGATE, Phaneesh Murthy. No negative impact of US polls on Indian IT - Gartner.
- Local languages hold key to 'Net'ting more Indians. "India doesn't have enough bandwidth when the 300-400 million more people come online" - Rajan Anandan, MD, Google India.
- Over the decade (2010-20), digital information in India will grow from 40,000 petabytes to 2.3 million petabytes. The big data solutions market in India is expected to double to $153.1 million by 2014 from $80 million in 2012 - IDC.
- Nasscom projects IT industry's growth at 11-14%.
- IT spending in Asia-Pacific to touch $743 billion in 2013 - Gartner.
- Titan, a Cray XK7system, named world's fastest, IBM Sequoia is second.
- Digital financial services market to rise eight-fold to up to $70 billion by 2020 - McKinsey.
- Global mobile phone sales to end-users touched almost 428 million units in Q3 of 2012, a 3.1% fall over the same period of 2011 - Gartner.
- Worldwide enterprise IT spending is forecast to total $2.679 trillion in 2013, 2.5% rise from $2.603 trillion projected for 2012 - Gartner.
- Mobile, cloud platforms are the new hunting ground for cyber criminals in 2013 - Symantec.
- Global Platform as Service revenue to touch $1.2 billion this year - Gartner.
- 70% shoppers make exact buy choice with online research - Google India.
- PC sales fall 5.4% in Q3 of 2012.
- Indian teens spend 86 % of their time daily on Facebook followed by 54% on Twitter - Survey by McAfee.
- Latin America next growth driver for IT Industry - IDC.

Telecom, Govt., Policy, Compliance

- Algerian group on the prowl; hacks Govt. websites including DRDO, RCI, and PM's adviser on public information.
- TRAI favors spectrum for telcos renewing licenses to ensure continuity of services.
- Tougher telecom M&A norm to cut out windfall gains for buyers.
- Pay more if you send over 100 SMS a day - TRAI.
- Not many takers for CDMA spectrum as a no. of operators pull out from auction.
- Airtel gained most from 2002 move to allot extra spectrum - CBI.
- DoT's one-time levy may yield only Rs. 6,000 crore this year.
- DoT sets Dec 31 deadline for monitoring BlackBerry services. No direct access to servers - RIM.
- Keep Huawei, ZTE out of the Rs. 20,000-crore National Optic Fibre Network (NOFN) project - C-DoT.
- 2G scam: JPC still divided on list of witnesses. Apex court stays all proceedings pending before Delhi HC. Centre rapped by Supreme Court for being 'casual'.
- Pakistan to allow mobile phone services with India.
- Telecom firms avoid bidding for 2G spectrum in Delhi, Mumbai.
- 1,800 mobile towers in Mumbai illegal - BMC.
- Twitter handle @India owned by a person in China.
- Spectrum Auction: Govt. ends up with less than Rs. 9,500-crore from 2G auction as against the estimate of Rs. 40,000-crore. Govt. will gain more from auction process - P. Chidambaram. Stop blaming CAG, Opposition tells UPA. Govt. to hold auction for unsold spectrum by March. Sale 'deliberately manipulated' - Joshi. Reserve price for 2G spectrum was set too high - Montek. EGoM to meet to discuss 2G auction fiasco.
- US to face tough debate on UN Internet rules as India and Brazil at an upcoming UN conference discussing global rules for the Internet.
- FDI policy on telecom gear to be put under scanner.
- Intel under competition panel's scanner for alleged unfair trade practices and monopolistic behavior.
- Centre asked to come out with Data Protection Act in order to get huge outsourced deals to India.
- Blocked SMS leaves Aircel consumers with sore thumbs
- Govt. working on incentive policy for setting up of electronics testing labs.
- New version of IP address 'IPv6' available in India in price range starting at Rs. 21,999 compared to prevalent rate of around Rs. 66,000 in Asia Pacific region.
- Aadhaar authority (UIDAI) confident of delivering cards by Jan 2013.

IT Manpower, Staffing & Top Moves

- EMC launches cloud computing, big data analytics courses in India. Aims to train over 30,000 engineering students in the first year.
- TCS rated ICT employer of the year in Netherlands.
- Cyrus Mistry appointed TCS Deputy Chairman. He would take over as Chairman from Ratan N. Tata on his retirement in December 2012.
- By 2015, 4.4 million IT jobs will be created globally to support big data. Of these, 9.6 lakh will be in the Asia-Pacific region - Gartner.

Company News: Tie-ups, Joint Ventures, New Initiatives

- Lenovo forays into Indian smartphone segment. To launch India-specific apps for its phones.
- Apple iPhone 5 was launched in India. Stores run out of first lot.
- Apple sells 3 million iPad minis in new launch in the first three days.
- Free Wi-Fi for Facebook users: Coming soon.
- CTS overtake Infosys again in quarterly revenues. It even beat the leader TCS in quarterly revenue growth.
- MobME Wireless Solutions bags technology rights to roll out mobile digital signatures in India.
- Google covers 1.5 lakh SMBs under online initiative. Targets 5 lakh SMBs in next two years.
- LinkedIn working on allowing payments in Indian currency.
- President launches Aakash 2 tablet. Govt. to purchase them at Rs. 2,263 and distribute to students at Rs 1,130.
- Google picks doodle created by Arun Kumar Yadav, a Class 9 student of Kendriya Vidyalaya, Chandigarh in Doodle 4 Google 2012 contest.
- Twitter unveils email sharing feature.
- Datawind to clear all paid orders for Aakash in 6 weeks. Ramping up production to 10,000 units every day.
- Indiatimes logs out of email services.
- $8.8-billion Autonomy charge may add to HP's troubles.
- Internet, mobile association to host AppFest in Hyderabad in December.
- Google announces 50-day long open source contest for students.
- Tata Elxsi launches incubation center for start-ups.
- Intel launches a new series of processors, Itanium 9500.
- IIT Kharagpur develops software to detect diabetic retinopathy.
- India to showcase Aakash-2 tablet at UN.

CSI Nihilent e-Governance Awards 2011-12
AWARDS LIST

A. State category

1. Award of Excellence: State of Bihar
2. Awards of Appreciation:
   - Green e-Governance: State of Odisha
   - Capacity Building: State of Rajasthan
   - Jury Appreciation: State of Delhi

B. Projects Category - Government of India

1. Award of Excellence: Passport Seva Project, Ministry of External Affairs, Govt. of India
2. Award of Appreciation: Indian National Data Centre for Long range Identification & Tracking, Director General of Shipping, Govt. of India, Mumbai

C. Projects Category- G2B

1. Award of Excellence: eUparjan, Civil Supplies Department, Govt. of Madhya Pradesh

D. Projects Category - G2E

1. Award of Excellence: Manava Sampada (A Green Governance Tool for Human Resource Management), Govt. of Himachal Pradesh

E. Projects Category - G2C

Award of Excellence

1. Centralized Online Real-time Electronic (CORE) PDS, Govt. of Chhattisgarh
2. Using Technology for strengthening Targeted Public Distribution System, Govt. of Gujarat
3. m-Governance, Rajkot Municipal Corporation, Government of Gujarat
4. eDistrict, Government of Kerala

F. Projects Category - G2G

1. Award of Excellence: Poll Monitoring System, Govt. of Goa
2. Award of Appreciation: Dynamic integration of Property, Land Records, and Cadastral Maps, Govt. of Haryana

G. Department Category

1. Award of Excellence: SWARNIM-RTO: A New Service Paradigm, Ports & Transport Department, Govt. of Gujarat

H. District Catgeory

1. Award of Appreciation (Joint): District Jhalawar, Govt. of Rajasthan & District Jabalpur - Govt. of Madhya Pradesh

I. Appreciation for Sustenance

1. eProcurement, Gujarat
2. VAT Information System, Gujarat
3. Samadhan Ek Din Mein, Madhya Pradesh
4. DC* Suite - Suite of Applications for e-Collectorate, Kerala
5. Integrated Information System for Foodgrains Management, NIC Dept of IT, New Delhi
6. eGovernance in Petroleum and Explosives Safety Organization (PESO), Govt. of India , Nagpur

R K Bagga
Chairman, CSI SIG e-Governace

4th Knowledge Sharing Summit (KSS-2012) Held on 5-6 Nov. 2012 at Raipur

Brief report

CSI Special Interest Group (SIG) on e-Governance conducted a very successful 4th Knowledge Sharing Summit (KSS-2012) in collaboration with Government of Chhattisgarh at Raipur on 5 and 6 November 2012 with theme "e-Governance in Emerging Era". The Inaugural Session was chaired by Mr. Sunil Kumar, Chief Secretary to the Government of Chhattisgarh. Mr. Aman Kumar Singh, Secretary Department of IT, gave an overview of ICT implementation in the State. Maj. Gen. (Retd.) Dr. R K Bagga, Chairman CSI SIGeGov highlighted the outstanding achievement of the State of Chhattisgarh in e-Governance by getting CSI-Nihilent eGov Awards in State category for two years (2008 & 2011).

(Picture 1 shows R K Bagga addressing the Inaugural Session with Dr. Raman Singh Hon'ble CM, Sunil Kumar CS, and M D Agrawal Past President & Chairman Awards Committee, CSI on the dais)

During the Inauguration of KSS2012, Dr. Raman Singh, Chief Minister of Chhattisgarh was conferred with e-Ratna Award by CSI Awards Committee Chairman, M D Agrawal. He read out Citation, giving role of Chief Minister as leader in implementation of various ICT initiatives including GIS, COREPDS, and Choice!

Dr. Raman Singh in his address highlighted that Information Technology has proved to be an important medium in Chhattisgarh for providing benefits of various schemes to the last man of the society, as a common citizen. He thanked CSI for the award of e-Ratna, this is the second Award, after Shri. Narendra Modi was given last year at Ahmedabad.

Mr. Rajiv Gauba, Additional Secretary Department of IT GOI and Prof. B S Sahay, Director IIM Raipur also addressed the gathering of over 500 delegates.

On the first day of KSS-2012, special sessions on International and National Best Practices were held, where leading specialists including Rajesh Agrawal (IT Sec Maharashtra), A M Parial (CEO, Chips), Santosh Choubhey (Chairman, AISECT), Vikas Sheel (Secretary, Food & CS), Pradeep Bhaumik (PwC), and Abhiji Dutt (TCS) shared their e-Gov experience with the delegates. The sessions were chaired by Surendra Kapoor (Fellow, CSI), Santosh Choubey (AISECT), and Piyush Gupta (NISG).

On the second day, Tuesday, 6 Nov 2012, R K Bagga chaired a special session on Cyber Laws and Homeland Security, where Supreme Court Advocate Mr. Vakul Sharma and D K Dwivedi gave their presentation on issues in cyber laws and Computerization efforts at Allahabad High Court, respectively. In final Technology Session, Piyush Gupta (NISG) gave case study on Capacity building, apart from special talks by Sumeet Gupta (IIM Raipur), Vasudev Rao (Digital Globe), and Rahul Chitale (Microsoft). Shri. Bipin Mehta, CSI Execom member chaired the final session.

Congratulations Chhattisgarh Team for organizing an excellent event!

R K Bagga
Chairman, CSI SIG e-Governace

(Pictures show Dr. Raman Singh, Hon'ble Chief Minister of Chhattisgarh receiving the e-Ratna Award and the Citation plaque from Shri. M D Agrawal, Past President CSI in the presence of other dignitaries)

Sanjay Mohapatra
Chairman CSI division IV (Communication)

CSI DIV IV (Communications) Workshop on Information Security and Ethical Hacking @ CV Raman College of Engineering, Bhubaneswar

A two-day workshop on **Information Security and Ethical Hacking named as LOOPHOLE +** was organized by the Computer Society of India (CSI) Student branch of CV Raman College of Engineering in collaboration with CSI division IV (Communication) on 9th and 10th of Nov. 2012 with a short seminar and demonstration on 3rd Nov 2012. In today's world, the cyber media has taken an important role in many business transactions such as internet banking, payment of utility bills, filing income tax return, insurance premium payment etc. used by the general public. Apart from using computers and laptops, mobile device applications have come up with the above capability. The use of e-mails, social networks such as Facebook, Orkut, LinkedIn etc. have started affecting all our lives. This raises the question of security and privacy in the Internet and mobile applications.

This workshop was intended to create awareness about malicious attacks such as Virus and Trojan Horses, Phishing, Illegal access, Website hacking, Mobile hacking etc. among the students who are the maximum users of such facilities. Participants were demonstrated the techniques to identify the attacks and means to protect themselves from such attacks. The technical sessions of the workshop was conducted by experts from Kyrion Digital Securities Pvt. Ltd, New Delhi, which is an information security organization founded by alumni of IIT Delhi. While teaching different security techniques the experts also discussed about the Indian Cyber law.

The Workshop was inaugurated by Prof. Dr. K. C. Patra, Director CV Raman. Around 500 participants including few faculties and students from other colleges participated in the workshop, held at the CV Raman college auditorium. Mr. Sanjay Mohapatra, chairman CSI division IV (Communication), and Dr. Rachita Misra, CSI Regional Student Counselor addressed the participants and briefed about CSI membership benefits and awards. Workshop kits and certificates were distributed to all.

In the last session, Kyrion experts organized a competition. The winners of this competition will get direct entry to the national-level information security competition known as Chakravyuh 2013. Chakravyuh is an effort by the Security Council of India to find the best IT security experts. ■

Dear CSI Member -

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You may send your feedback and comments on the contents of *CSI Communications - Knowledge Digest fo IT Community* to csic@csi-india.org.

- On behalf of editors of CSI Communications.

Debasish Jana* and Pinakpani Pal**, Program Chairs, EAIT 2012

*Chairman, CSI Kolkata Chapter
**Secretary, CSI Kolkata Chapter

EAIT 2012: Third International Conference on Emerging Applications of Information Technology

Organized and Hosted by Computer Society of India Kolkata Chapter at Indian Statistical Institute, Kolkata during 29 Nov – 1 Dec 2012

Encouraged by the responses from earlier versions of EAIT in 2006 and 2011, CSI Kolkata Chapter (CSIKC) organized the Third ***International Conference on Emerging Applications of Information Technology* (EAIT 2012)**. The conference was held at the Indian Statistical Institute (ISI), Kolkata from 29 Nov-1 Dec 2012 with greater impact. EAIT 2012 enjoyed the active collaboration and cooperation of both the academia and industry - it had over **200** delegates in attendance. The conference was successful in achieving the aspiration to blend theory and practice, research and production, art and science. EAIT 2012 received **403** papers from **793** authors across the globe. Paper submission was online through Microsoft's Conference Management Tool (CMT). All papers were meticulously reviewed by more than **140** members of the Program Committee and additional reviewers. Review process was double-blind. Finally, **97** papers were selected for oral presentations. The award-winning cover photo on the proceedings, also the theme photo of EAIT 2012 has been contributed by **Mr. Writwik Chakraborty**. The conference proceedings were published by IEEE and the presented papers will be soon available in IEEE Xplore™.

Pre-Conference Tutorial Session on Nov 29, 2012

The session was inaugurated by **Prof. Pradipta Bandyopadhyay,** Dean of Studies, ISI and **Prof. Aditya Bagchi,** Tutorial Chair, EAIT 2012. The panel of speakers comprised of learned luminaries like **Dr. Amlan Chakrabarti,** University of Calcutta (Random Walk on Graphs in a Quantum Way), **Mr. Arup Roy,** Senior Consultant in Information Security Management (Information Security), **Prof. Asesh Das,** West Virginia University and Pennsylvania College of Technology, USA (Software Engineering: An Information Technology Approach), and **Dr. Sourav Dutta,** Executive Telecom Consultant, IBM (Cloud Computing). About **60** participants attended the tutorial talks.

Conference Inaugural Session on Nov 30, 2012

In welcoming the delegates, **Prof. D P Mukherjee,** Organizing Chair, presented the need of the hour in encouraging cutting edge R&D. **Prof. Bimal K Roy,** Director, ISI inaugurated the conference. While expressing profound contentment about the program of EAIT 2012, Prof. Roy offered his willingness to collaborate as well as co-host the future EAITs and CSI events of this stature at the ISI premises. **Prof. R Balasubramanian,** Director, IMSc, Chennai, was overwhelmed and expressed his views that CSI should encourage and come up to this level of quality conferences in other places too. **Mr. Satish Babu,** President, CSI expressed his delight in joining EAIT 2012 team of CSIKC and talked about CSI. **Dr. Debasish Jana,** Program Chair, explained the program, its objectives and sketched a brief schedule. After lighting of the lamp, **Mr. John W Walz,** 2012 President, IEEE CS released the proceedings and expressed his pleasure in attending the conference. **Mr. R T Goswami,** Finance Chair thanked all the sponsors, especially technical co-sponsor IEEE Computer Society and appreciated the efforts of the enthusiastic team.

Comments from Special Guests

"Thank you for making us so welcomed at your excellent conference, EAIT 2012. The venue, Indian Statistical Institute, was perfect to share to cutting edge emerging applications in information technology. We enjoyed walking the grounds and visiting the Mahalanabish museum to sense the remarkable statistical history. Your organizational skills keep everything moving smoothly, with time for discussions. By every measure, EAIT 2012 was an excellent conference with the best 91 papers presented from the 403 submitted. The two talks honoring your pioneers, set the mark for excellence. I recommend the IEEE Computer Society be invited to technical co-sponsor EAIT 2013 conference." - **John Walz,** 2012 President, IEEE Computer Society

"You organized an excellent conference, both in terms of technical quality and local arrangements. The number of submissions, number of reviews, and number of accepted papers all indicate that your conference generated quality content. For my part, the Cloud Computing keynote was a highlight. ISI is an excellent venue. I was honored to meet Director B K Roy" - **Angela Burgess,** Executive Director, IEEE Computer Society

"The conference was most informative and enjoyable. I look forward to further contact." - **David Alan Grier,** Fellow, IEEE, 2013 President, IEEE Computer Society

Plenary Talks and Keynote Speech on Nov 30, 2012

First Plenary talk was on the National Year of Mathematics for Quasqui-centennial (125 years) celebration of Ramanujan, talk titled *Partition Function* by **Prof. R Balasubramanian,** Director, IMSc, Chennai. Second plenary talk was on Birthday of Acharya Jagadish Chandra Bose, titled *Modelling Proportionate growth with Abelian networks* by **Prof. Deepak Dhar,** TIFR, Mumbai. The keynote speech was on *Cloud Computing: Research Opportunities and Challenges* delivered by **Prof. Rajkumar Buyya,** University of Melbourne, Australia. The attendees appreciated their inspiring deliberations with great enthusiasm and applause.

Conference Sessions on Nov 30-Dec 1, 2012

91 papers were presented in 20 technical sessions split into 4 parallel tracks. In addition, four invited talks were held on emerging areas by eminent speakers of world repute, **Prof. Bhabatosh Chanda** (ISI), **Prof. Sanjoy K Saha** (Jadavpur Univ.), **Prof. Subhash C Basak** (U of Minnesota, USA), and **Prof. Kaushik Dutta** (NUS, Singapore). A cultural evening with musical and dance program followed by Banquet was enjoyed by all. A separate panel of judges selected nine presented papers based on their content, research contribution as well as presentation.

Computer Society of India™

National Young IT Professional (YITP) Awards 2012

About YITP Awards:

The National competition for young IT professionals is an event conducted annually instituted by CSI in the year 1999 to encourage Researchers, IT Professionals, Academicians, Consultants, Entrepreneurs and IT Practitioners in an Organization or as individuals in service/ support/ training function in the field of Information Technology.

Themes:

Hardware. Software, Application, Communications and Education & Research

Awards Comprise of:

Trophy and Certificate to winning team/individual and prize as under:

Category	National Awards	Regional YITP award (For each region)
Winner	₹ 50,000/-	₹ 25,000/-
1st runner up	₹ 25,000/-	₹ 15,000/-
Special mention	₹ 15,000/-	₹ 10,000/-

The winners of the regional contest will qualify for competing in the final national round.

Host Chapters for Regional Contest

Regional Round will be held at	Territory	Regional YITP Conveners	Last Date of Application	Regional Round on
Region-I **DELHI**	Delhi, Punjab, Haryana, Himachal Pradesh, Jammu & Kashmir, Uttar Pradesh, Uttaranchal and other areas in Northern India	**Prof. M N Hoda** Mob: 09212022066 Email: mca.hoda@gmail.com	31/12/2012	16/02/2013
Region-II **KOLKATA**	Assam, Bihar, West Bengal, North Eastern States and other areas in East and North-East India	**Mr. Deva Prasanna Sinha** Mob: 09830129551 Email: devaprasannasinha@rediffmail.com	31/12/2012	19/01/2013
Region-III **AHMEDABAD**	Gujarat, Madhya Pradesh, Rajasthan and other areas in Western India	**Mr. Sanjay Parikh** Mob: 09376152193 Email: Sanjay.Parikh@relianceada.com	28/01/2013	9/2/2013
Region-IV **BHILAI**	Jharkhand, Chhattisgarh, Orissa and other areas in Central & South Eastern India	**Mrs. Ranjana Muley** Mob: 09407982385 Email: rmuley@sail-bhilaisteel.com	1/1/2013	20/01/2013
Region-V **BANGALORE**	Karnataka and Andhra Pradesh	**Mr. Bindhumadhava** Mob: 09844253414 Email: bindhu@cdac.in	8/2/2013	22/02/2013
Region-VI **NASHIK**	Maharashtra and Goa	**Mr. Prashant Patil** Mob: 09545453233 Email: principal@sandippolytechnic.org	20/01/2013	7/2/2013
Region-VII **CHENNAI**	Tamil Nadu, Pondicherry, Andaman and Nicobar, Kerala, Lakshadweep	**Dr. R M Suresh** Mob: 09444285519 Email: rmsuresh@hotmail.com	24/12/2012	3/1/2013

The National round will be hosted by **CSI, Coimbatore Chapter** at **PSG College of Technology, Coimbatore, Tamil Nadu** on **CSI Foundation Day - 6th March 2013**. CSI National Young IT Professional Award will be presented on the same day.

National Round Patron : **Dr. R Nadarajan,** PSG College of Technology, Coimbatore
Event coordinator : **Mr. N Valliappan,** Secretary, CSI Coimbatore Chapter (Mob: 09842231307)

How to apply

Nominations should be made in the prescribed format available on the CSI-website: http://www.csi-india.org/web/csi/yitpawards2012 or http://www.csi-india.org/yitpawards2012 on or before the last date of submission for the specific region to the Regional Convener.

Bipin Mehta
Convener, CSI Young IT Professional Awards

Parmata Satyanarayana
Co-Convener, CSI Young IT Professional Awards

MD Agrawal
Chairman, CSI Awards Committee

From CSI Chapters »

Please check detailed news at:
http://www.csi-india.org/web/csi/chapternews-December2012

SPEAKER(S)	TOPIC AND GIST
GHAZIABAD (REGION I)	
Prof. (Dr.) Raj Kamal, Mr. Vipin Tyagi, Prof. Rishikesha T Krishnan, Prof. Bharat Bhasker, Prof. A K Puri, and Vineet Kansal 	**20 October 2012:** 7th National Conference **"Communication Technologies & its Impact on Next Generation Computing (CTNGC-2012)"** Chief Guest, Prof. Raj Kamal spoke on evolution of communication technologies and narrated their chronological development. He also addressed the issues related to efficient deployment of communication technologies and talked about 4G Networks. During the parallel sessions on relevant themes contributors from different parts of the country, including Gujarat, Maharashtra, Andhra Pradesh, etc., participated and presented their research papers. ← *(L to R): Dr. A K Puri, Sri Vipin Tyagi, Prof. Raj Kamal, Mr. Arpit Chadha, and Dr. Vineet Kansal*
KOLKATA (REGION II)	
Prof. C A Murthy and Prof. Bhabatosh Chanda 	**9 October 2012:** Proceedings of the Half-Day Seminar on **"Remote Sensing and Image Processing: Contemporary Contextualities and Vistas for Future Generation"** The principal objective was to foster strong scientific temper among young engineering aspirants on the application areas of Space Science with special reference to its contemporary contexualities in Remote Sensing and Image Processing technology. Prof. Murthy gave a technical talk on "Basics and Applications of Coloured Image Processing". Prof. Chanda deliberated on "Basics and Applications of Remote Sensing" which motivated students to get acquainted with new emerging vistas of Space Science. ← *Speaker conducting seminar*
AHMEDABAD (REGION III)	
Mr. Vikash Patel 	**2 November 2012:** A special Lecture on **"Android Overview"** Mr. Patel explained various topics like Android Operation System, Android Versions, Features of Android, Architecture of Android, Important Android components, Dalvik Virtual Machine, Security and permissions, AndroidManifest.xml, R.java, Resources and Assets, Reference to resources in XML files. Many interesting questions were raised by students regarding usability of android, web service based applications and security of applications. The live project demo was also given by speaker. ← *Speaker and students during the lecture*
UDAIPUR (REGION III)	
Mr. Mazher Hussain and Dr. N K Pareek 	**5 November 2012:** Technical Event In the event five activities, viz. – programming contest, IT quiz, Web designing, computer cross word and Sudoku - were held. Twenty five teams, comprising two members in each team, from various engineering and professional colleges of Udaipur city participated in the event. ← *Participants performing during events*

SPEAKER(S)	TOPIC AND GIST
BHUBANESWAR (REGION IV)	
Prof. Dr. K C Patra, Kyrion experts, Mr. Sanjay Mohapatra, and Dr. Rachita Misra 	**3 November 2012:** Workshop on **"Information Security and Ethical Hacking"** This workshop was intended to create awareness among students about malicious attacks such as Virus and Trozen Horses, Phishing, Illegal access, Website hacking, Mobile hacking etc., since students are the users of such facilities most of the time. Participants were demonstrated the techniques to identify the attacks and means to protect themselves from such attacks. ← *RSC Prof. Ratchita Mishra's addressing to students*
COCHIN (REGION VII)	
IT Managers from different companies 	**2 November 2012:** A Panel Discussion on **"IT Security"** IT Managers and team members from different companies in and around Cochin participated in the discussion which was focused on Laptop Security. Everyone shared the policies adopted for Laptops in their organizations and discussed about the pros and cons. It was a very knowledge-sharing session. ← *IT Managers Forum under the CSI Cochin Chapter, conducting a Panel Discussion on IT Security (Part-1)*
TIRUCHIRAPALLI (REGION VII)	
Dr. Gopinath Ganapathy, Dr. K Meena and Dr. R K Subramaniam, Mr. Leo Anand and Miss. Bhavya Siddappa 	**26 September 2012:** National Seminar on **"Cloud Computing"** The main objective was to sensitize the audience about concepts of cloud computing, the service models and delivery structures. Dr. R.K.Subramaniam inaugurated the seminar and released the "e-resources" for Cloud Computing. Mr. Leo Anand and Miss. Bhavya Siddappa delivered the special invited talks. ← *Chairman addressing*

From Student Branches »

http://www.csi-india.org/web/csi/chapternews-December2012

SPEAKER(S)	TOPIC AND GIST
ACADEMY OF BUSINESS AND ENGINEERING SCIENCES (ABES) ENGINEERING COLLEGE, GHAZIABAD, UP (REGION-I)	
Mr. R K Vyas, Prof. M N Hoda, Dr. Ajay Kumar Agarwal, Ms. Renu Garg, and Ms. Pragya Tewari 	**3-5 October 2012:** Three days event **"Fest with Zest 12"** In this Fest various activities were concluded to explore and enhance technical skill, creativity, leadership and team spirit skill amongst students. The activities included Code Weaver, JAM, AD-MAD Show, Online gaming, Flash Gracer, On the Spot Programming, Web Designing, IT-Vocab, Poster Design and Brain Teaser. First three winners of every activity were presented glittering trophies. ← *Distribution of Trophies and Certificates to students*
BHARATI VIDYAPEETH, NEW DELHI (REGION-I)	
Prof. M N Hoda, Mr. R K Vyas, Mr. V K Gupta and Mr. Manoj Sethi, Mrs. Parul Arora, and Mr. Shivendra Goel 	**10 November 2012:** Region – I Students' Convention **"RSC – 2012"** There were six events - On the Spot Programming, Debate, Quiz, Web Designing, Rangoli and LAN Gaming. Over 400 students from 38 colleges from different states like Delhi, Haryana, Punjab, UP, Uttrakhand, Himachal and Jammu and Kashmir participated in the events. ← *(Eight issue of the International Journal BIJIT is being released during the RSC - 2012: Left to right; Mr. Manoj Sethi, Prof. M N Hoda, Mr. R K Vyas, Mr. V K Gupta, and Mrs. Parul Arora)*

SPEAKER(S)	TOPIC AND GIST
AES INSTITUTE OF COMPUTER STUDIES (AESICS), AHMEDABAD (REGION-III)	
Mrs. Shefali Naik and Ms. Kunjal Gajjar 	**15 September 2012:** Workshop on **"Requirements Management using Software Engineering Tools"** Speakers explained the importance of requirements in software development. They demonstrated how to create Software Requirement Specification documentation using a software engineering tool and participants prepared documentations for a given case. ← ***Speaker and participants during workshop***
Mr. Suril Shah 	**18 September 2012:** Lecture on **"Innovation and Entrepreneurship"** Speaker explained how students can showcase their new ideas and receive funding and support from people, for converting ideas into reality quoting the example of innovative website platform called kickstarter.com. He gave several innovative project ideas on various areas of IT application like healthcare, electronic medical records, augmented reality, image processing applications, natural language processing, education, interactive and self paced learning videos, information security and cloud based applications. ← ***Mr. Suril Shah, Stanford University delivering the lecture***
ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY AND SCIENCE (ANITS), VISAKHAPATTANAM (REGION-V)	
Prof. VSRK Prasad, Prof. Suresh Chandra, and Bhargava Vadapalli 	**14 November 2012:** Guest Lecture on **"Technology Trends, Consumer Impact and Opportunities"** Prof. VSRK Prasad advised students to utilize the opportunity to interact with Industry pioneers. Bhargava Vadapalli enlightened the students with recent technological trends in the Indian market, key drivers & business/Job opportunities for the budding engineers in the next decade. ← ***Sri Bhargav Vadapalli delivering lecture to the students***
AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY (ASCET), GUDUR, AP (REGION-V)	
Mr. D Sai Satheesh, Dr. AVS Prasad, and Prof. V Muniraju Naidu 	**20 May 2012:** A two day workshop on **"Cyber Security and Malware Analysis"** The workshop witnessed a Book Release event. The authorized TEXT BOOK on subject " HACKING SECRETS" authored by Mr. D. Sai Satheesh, was released by Dr. AVS Prasad. Large number of students were present on the occasion. ← ***Speakers and guests who conducted workshop***
MVJ COLLEGE OF ENGINEERING (MVJCE), BANGALORE (REGION-V)	
	**21 September 2012: "Come C"** Coding contest The event had three rounds. In "Knock yourselves out with C" round students had to tackle tricky MCQ's. In "Code or Collapse" round participants had to write code and debug segments of programs. The final round, "Can you crack it?!" was held on the concluding day of the competition. The purpose of the event was to provide a platform for students to test their technical skills and also to instill the spirit of active participation. ← ***Encl : With the 15 finalists and the winners of the "Come C" Coding contest with Prof. K Avayambal, Dr. Badarinarayan, Prof. Preethi Sheba, & Prof. Gayathri***

SPEAKER(S)	TOPIC AND GIST
MVJ COLLEGE OF ENGINEERING (MVJCE), BANGALORE (REGION-V)	
Mr. Amit Surana 	**22 September 2012:** Lecture on **"Emerging Trends in Mobile Technologies"** Mr. Amit opened the session by telling the importance of application development. He said that the power of apps. is so revolutionary that it finds its use in many industries like medicine, airlines and other enterprises. He spoke about the influence of individual app. developers on the iPhone and Android environments. ← *From left: Prof. K Avayambal, Dr. K S Badarinarayan, and Mr. Amit Surana*
Mr. Arvind Kumar Shukla and Mr. Prashant K S, Mr. Chandar P Mannar, Ms. Bhanumathi, Dr. K S Badarinarayan and Ms. Avayambal 	**4-5 October 2012:** A two day National Conference on the **"Frontiers in Virtualization and Computing Technology FVCT-2012"** The Chief guest for the event was Mr. Chandar P Mannar. Mr. Arvind Kumar Shukla and Mr. Prashant K S delivered a technical talk on Virtualization and Cloud Computing. Paper presentations on a wide variety of topics followed the talk. ← *(Release of conference Proceedings) From Left: Prof. K Avayambal, Mr. Chandar P Mannar, Dr. K S Bardarinarayan, and Mr. Arvind Kumar Shukla*
R.V. COLLEGE OF ENGINEERING (RVCE), BANGALORE (REGION-V)	
Mr. Pradeep Reddy and Srinidhi S 	**28 September 2012:** Technical Talk **"Cyber Forensics – Ethical Hacking"** Speakers emphasized that Information security is the major concern in the current days IT scenario quoting various security incidents such as lottery mails, spam, email bombing, malwares, viruses that cause disturbance, data theft, Piracy, violation of copyright and so on. All these have led to enforce appropriate laws. National security is the need of the hour for which enough number of security auditors are needed. Lot of career opportunity openings are created and they are available to the professionals as security auditors. ← *The participants & Speaker during talk on Cyber Forensics*
SHRI VISHNU ENGINEERING COLLEGE FOR WOMEN (SVECW), AP (REGION-V)	
Md. Shabber 	**3-8 September 2012:** Workshop on **"Web Project Development Using Dot Net Technologies"** Training Modules included modules based on topics such as - DOT NET Technology Framework, C# Programming, ASP.NET, ADO.NET and Project work using DOT NET Technology. ← *Sri. K Durga Naveen, addressing the gathering*
SIDDAGANGA INSTITUTE OF TECHNOLOGY (SIT), TUMKUR, BANGALORE (REGION-V)	
Srinidhi, Amar, Mr. Bindu Madhava, Dr. L Suresh, Chander Mannar, Prof. Prakash, Vishwas Bondade, Dr. Poornima B and Bhanumathi K S, Seetaramu T N, Sabapathy T. 	**12-13 October 2012:** 26th CSI Karnataka Students Convention on theme **"Green Computing – Challenges & Change"** There were sessions such as "Information security" by Srinidhi, "Windows 8" by Amar, and "Kannada & Green computing" by Srinidhi. The Panel discussion on the theme was conducted by Mr. Bindu Madhava. There was Technical Paper presentation by the students. Other competition events conducted were - OSP in C++, Mobile application development, Innovative application software proposal and Technical Quiz. Prizes were distributed to winners. ← *Release of Convention Proceedings*

SPEAKER(S)	TOPIC AND GIST
VASAVI COLLEGE OF ENGINEERING (VCE), HYDERABAD, AP (REGION-V)	
J Nagababu 	**21 September 2012:** Guest lecture on **"Human Machine Interaction using Microsoft Speech API"** J Nagababu gave a lecture on Human Machine Interaction using Microsoft Speech API. He gave practical demonstration of text speech conversion using java and java Scripts. He is the first Indian blind (visually challenged) to receive diploma and then B-Tech degree. He inspired both faculty and students with his lecture and his sound technical knowledge. Students were spell-bound with the way he interacted with computer and with his programming skills. ← ***Dignitaries on dias***
VIGNAN'S LARA INSTITUTE OF TECHNOLOGY AND SCIENCE, VADLAMUDI, GUNTUR, AP (REGION-V)	
Mr. I L Narasimha Rao 	**29 September 2012:** One-day Guest Lecture on **"Awareness on Information Security"** Mr. Rao enthusiastically spoke about information security in current society scenario. He emphasized that future technocrats have to do more analysis on security threats like jombies, window surfing, trimming, skimming, shoulder surfing and other security problems. He also added that mastering in security domain could enable students to help prevent plastic cash frauds and help online public users. ← ***Guest speaker during the lecture***
K.J. SOMAIYA COLLEGE OF ENGINEERING, MUMBAI (REGION-VI)	
Mr. Fahim Siddiquei and Mr. Shardul Mahadik 	**29-30 August 2012:** Workshop on **"Website designing using WORDPRESS"** The motto of the event was to explain the topic to participants with minimal pre-requisites. Generally website designing includes coding using numerous technologies, but using WordPress speakers introduced participants to a much simpler and effective way of web designing. Topics covered were - Posts, Pages, Plug-ins, Comments, Users, Settings. Using LAN SCHOOL the participants were explained in detail the step wise procedures. ← ***Participants during the workshop***
	**14-15 September 2012:** CSI v/s CSI Battlefield 2012 This event was the 2nd year of the CSI v/s CSI battlefield organized under the technical festival of KJSIEIT, Sion – Renaissance 2012. The event was distributed into 6 rounds: Day-1 Publicity, Technical, Creative and Day-2 Resource, Marketing, Management. ← ***Participants during event***
Mr. Ravi Eppaturi and Mr. Rajiv Gerela 	**21 September 2012:** Seminar on **"Cloud Computing"** Using an attractive PowerPoint presentation each topic was explained precisely. Topics covered were - Introduction to cloud, Types of cloud, Day-to-day applications of cloud computing, Efficient examples of Banking and Mailing systems and Security issues. Sessions were interactive sessions. ← ***Speakers conducting seminar***

SPEAKER(S)	TOPIC AND GIST
RAJARAMBAPU INSTITUTE OF TECHNOLOGY RAJARAMNAGAR, SAKHARALE (REGION-VI)	
Mr. T Anand, Knewron, Pune 	**8-9 September 2012:** Technical event **"Technosphere 2k12"** Mr. Anand delivered a workshop on "Effective use of Open Source Web Tools". The technical/nontechnical events like Treasure hunt @ C, D-War (Debate competition), Web Nirman (Deb Designing contest) and LAN Gaming were conducted on the next day. ← *From Left: Prof. Mrs. Ashwini Patil, Prof. S S Pati, Mr. T Anand, Prof. D G Thombare, Prof. M T Telsang, Prof. S A Thorat, and Mr. R J Mandale during Inaugural function of "Technosphere 2k12"*
A.V.C COLLEGE OF ENGINEERING (AVCCE), MANNAMPANDAL, TN (REGION-VII)	
Dr. M Arun Kumar 	**1 October 2012:** One day Guest lecture on **"Machine Learning"** Dr. M Arun Kumar spoke about Machine learning and Data Mining and demonstrated the Machine Learning tasks by considering a real time Chess game. He narrated the basic functionalities required for solving a given problem. He also gave wider perspective on the current research areas like Information Retrieval and Optimization techniques. ← *Guests on stage*
D.J. ACADEMY FOR MANAGERIAL EXCELLENCE, COIMBATORE (REGION-VII)	
Mr. J Balachandar and Mr. T Nallaperumal 	**24-25 August 2012:** Two day Workshop on **"Android"** Workshop on Android helped students to sharpen skills in designing and developing apps for the Android platform. The workshop focused on aspects that students should understand, on how to write practically and understand Android Apps. The sessions gave hands-on training in Android Application Development. ← *Shree M A Chandrasekara Rajha is delivering the inaugural address. From left: Mr. T Nallaperumal, Shree. C L Mohan Naarayan, Mr. J Balachandra, and Dr. N Prem Anand*
JEPPIAAR ENGINEERING COLLEGE, CHENNAI, TN (REGION-VII)	
Mr. Y Kathiresan, Dr. Sushil Lal Das, Dr. V L Jyothi, Dr. R Sabitha, and Mrs. BabymolKurian 	**25 September 2012:** A National Level CSI Technical Symposium **"SAVVY'12"** The Symposium was inaugurated by Mr. Y Kathiresan and Dr. Sushil Lal Das. The events such as Epigram, Splash, Bugs Retreat, Acumen-Check, Nerd-Talk, and online events were conducted by student coordinators. All the winners were awarded with cash prizes and certificates. ← *Honoring the guest*
MAHENDRA ENGINEERING COLLEGE (MEC), NAMAKKAL (REGION-VII)	
Mr. M Manikandan and Mr. M Sudhakar 	**8-9 September 2012:** Two Days National Workshop on **"Enterprise Private Network and Network Security"** Topics discussed were Campus Networking, Enterprise Networking, Configuration of Router, Configuration of Switch, Concept of Gateway and its application and challenges in wired networks. Resource persons also covered topics such as - Designing of Firewalls, Configuring the Servers like DHCP, DNS etc. and real time scenario of Email communication. A video lecture was also shown about basic networking which explained packet delivering, routing and switching. ← *From Top Left to Right: 1) Mr. M Mahadevan 2) Prof. S Raju 3) Mr. M Sudhakar 4) Dr. R Samson Ravindran 5) Mr. M Manikandan 6) Dr. S Andrews*

SPEAKER(S)	TOPIC AND GIST
NARASU'S SARATHY INSTITUTE OF TECHNOLOGY (NSIT), POOSARIPATTY, SALEM (REGION-VII)	
Mr. Abdul Kareem, Mr. Raja Arjun, Mr. K Senthil, and Mr. Pradeep Samuel 	**22 September 2012:** One day workshop on **"PC troubleshooting & Hardware Assembly"** The Project manager Mr. Abdul Kareem highlighted the basic components of a PC and the process of assembling them. He also delivered his ideas on over locking and secrets of improving performance. In a query session, he actively gave answers for various questions put forth by the students. ← *Resource personalities during workshop*
NATIONAL COLLEGE OF ENGINEERING (NCE), MARUTHAKULAM (REGION-VII)	
Mr. Ganesan Gajendrapandian and Prof. Dr. M Mohamed Sitheeq 	**22 September 2012:** One day National-level Seminar on **"Android Mobile Applications"** The resource person covered various topics such as history of Android, Android OS software stack, Mobile Applications Development and its economy, Android SDK installation, Android Activity, Android service etc. ← *Speakers on the dais (From Left: Prof. Dr. S Kother Mohideen, Mr. Ganesan Gajendrapandian, Prof. A Mohamed Anwar, and Prof. Dr. M Mohamed Sitheeq)*
PERUMAL MANIMEKALAI COLLEGE OF ENGINEERING, HOSUR, TN (REGION-VII)	
Prof. V Keerthika, Dr. S Chitra, and Ms. Harmeet Kaur 	**13-14 August 2012:** A two day workshop on **"Personal Effectiveness Traits and Skills"** The workshop was organized and conducted by Prof. Keerthika. Dr. Chitra while inaugurating explained the need of personality development and importance of learning soft skills for becoming an outstanding Engineer and improving the opportunities of placement in the current competitive era. ← *Honoring guests*
Mr. Siji Kuruvilla Geroge, and Mr. Dattatherya Sathyamurthy 	**28 August 2012:** A One day workshop on **"Cloud Computing"** Speakers explained about the cloud computing technology tools such as VMware QE & Dev, testing of ESX etc. Students were encouraged to keep themselves updated apart from regular curriculum, as this would help them to hone their skills and get placed in top notch companies. ← *Honoring the guest lecturer*
SHRI ANGALAMMAN COLLEGE OF ENGINEERING & TECHNOLOGY, TRICHY (REGION-VII)	
Prof. Zahir Hussain, Prof. Madhusudhanan, Dr. W Christ Raj, and Dr. N Saivaraju 	**25 September 2012:** Workshop on **"Open Source Software"** Prof. Hussain stressed the significance and importance of open source software. Prof. Madhusudhanan deliberated on applications of open source software in everyday life, its importance in both industry and institutions and various aspects which are critical in research and development. Dr. Christ Raj underlined importance of multitasking, learning innovative ideas to keep abreast of new technologies. Dr. Saivaraju provided tips to keep pace with developments in science and engineering. ← *Principal, Chief guest and Dean on stage*

SPEAKER(S)	TOPIC AND GIST
VELLORE INSTITUTE OF TECHNOLOGY (VIT UNIVERSITY), CHENNAI (REGION-VII)	
	**1 September 2012:** One-day workshop on **"Android 4.0 – Mobile Application Development"** Initially speakers provided introduction to Android and its evolution, architecture, tools etc. Later students had hands-on training in developing a simple Android application. The speaker explained the tool and procedure and students tried them on the system provided in the lab. All the systems were loaded with Eclipse, Android SDK and other necessary plug-ins. ← *Speaker conducting workshop in VIT*
VINAYAKA MISSIONS KIRUPANANDA VARIYAR ENGINEERING COLLEGE (VMKV), SALEM (REGION-VII)	
Mr. Manikandan Parameswaran, Mr. Naga Subramaniya Chokkanathan, Dr. A Nagappan, and Dr. P Selvam 	**6 October 2012:** A National-level student technical symposium **"BUDSITUP'12"** Events such as Paper Presentation, Debugging Contest, Program Fest, Grand Master, Just a Minute, Short Film, Gaming and Fun Buz were conducted. Mr. Parameswaran spoke about software products and services. Mr. Chokkanathan said that everyone has to go through different phases of career no matter whether a technologist or a developer. He said that in software product development, success of the product developed is not certain and so one has to be patient since the product will sell automatically once it gets recognized. ← *Resource person during the technical symposium*

Inauguration

Following new student branches were opened as detailed below -

REGION III

Prof. Dr. K R Pardasani (professor MANIT, Bhopal)

- **Sagar Institute of Science & Technology (SIST), Bhopal -** The CSI-SISTec Student Branch inauguration was held on 25th September, 2012 at the hands of Col. N P Dixit. Guests of honor were Shri. Vivek Dhavan, Chairman, CSI Bhopal Chapter and Dr. K R Pardasani. The ceremony was followed by a Technical Seminar on "Data Mining" by Prof. Pardasani.

REGION V

- **Amrita Vishwa Vidyapeetham, Mysore -** CSI student branch was formally inaugurated on 10th October, 2012. Mr. Sreekumar Vobugari was the Chief Guest and Ms. H S Nagalakshmi, Prof. Vidya Pai, and Mr. Sunil Dharmapal graced the occasion. Mr. Sreekumar delivered a seminar on BIG DATA during the technical session. He emphasized the need for new technologies to manage and productively utilize the exponentially growing database in organizations. Mr. Sreekumar elaborated on HADOOP, a technology solution to process huge volumes of unstructured data.

- **Godavari Institute of Engineering and Technology, (GIET) Rajahmundry, AP -** Inauguration of CSI Student Branch was held on Engineers Day, i.e. 15th September, 2012. The office was inaugurated by Vice Chancellor of JNTUK through video conference organized by CSI Student Branch of GIET. The function was followed by technical paper presentation, Quiz, poster presentation, and project exhibition. Around 150 projects were exhibited on this event and more than 200 papers were presented.

REGION VII

- **Latha Madhavan Engineering College (LMEC), Madurai -** CSI Student Branch was inaugurated by Dr. M Sundaresan - Tamilnadu State Student Coordinator, Professor and HOD/CS, Bharathiar University, Coimbatore on 27th August, 2012 with 100 active participants. The function was presided over by the Principal Dr. Marimuthu. Special address was given by Vice Principal, Dr. P V Rajendra Sethupathy.

Please send your event news to csic@csi-india.org . Low resolution photos and news without gist will not be published. Please send only 1 photo per event, not more. Kindly note that news received on or before 20th of a month will only be considered for publishing in the CSIC of the following month.

Call for proposals from CSI Student Branches for conducting

ELECTRONIC SYSTEM DESIGN AND MANUFACTURING (ESDM) WORKSHOPS

Under Government of India funding scheme

Department of Electronics & Information Technology, Govt. of India has granted approval to CSI to conduct Electronic Systems Design & manufacturing (ESDM) workshops at 50 academic institutions nationally (max. 4 per state) as part of its communications and brand building campaign 2011-13. The objective of these workshops is to make academia and students aware of this sunrise sector, its importance for economic growth of our country, and to attract talent to the sector for meeting its intellectual and human resource requirements.

The Workshop would comprise of invited lectures by experts from the local electronics manufacturing industry in the forenoon followed by a field visit to an electronics production facility/design house in the afternoon for members of the CSI student branch. These workshops are to be conducted at all states across India. Institutions conducting this program will be provided suitable budgetary grant towards meeting the costs of resource persons/ field visit etc.

CSI student branches willing to conduct the workshop at their institution may log on to www.csi-india.org or write to Mr. Yogendra Gahulat, Asst Manager, CSI Education Directorate at yogendra.gahlaut@csi-india.org for further details before 25th December 2012.

M D AGRAWAL	**S RAMANATHAN**	**RANGA RAJAGOPAL**
CHAIRMAN - ACADEMIC COMMITTEE	SECRETARY	NATIONAL STUDENT COORDINATOR

CSI Calendar 2012

Prof. S V Raghavan
Vice President & Chair, Conference Committee, CSI

Date	Event Details & Organizers	Contact Information
December 2012 Events		
19-21 Dec. 2012	**International Conference on Software Engineering & Mobile Application Modeling & Development (ICSEMA-2012)** CSI DIV IV (Communications) B S Abdur Rahman University, Chennai & Deakin University, Australia http://icsema.bsuniv.ac.in/	Dr. K M Meheta, kmmeheta@bsuniv.ac.in icsema2012@bsuniv.ac.in Mr. Sanjay Mohapatra, div4@csi-india.org smohapatra70@yahoo.co.in
20-22 Dec. 2012	**Futuristic Computing - ICFC 2012** RVCE, Bangalore	Prof. Sumitra Devi, sumithraka@gmail.com
21 Dec. 2012	**Workshop on Documenting Requirement Use Cases** CSI Mumbai Chapter at Mumbai http://www.csimumbai.org/Files/Event_Brochure/P-021605eHkL67.pdf	Harshvardhan Mane harsh@csimumbai.org / info@csimumbai.org
21-22 Dec. 2012	**A Seminar on Recent Advances in IT Security and Governance** Computer Society of India, Visakhapatnam Chapter	Suman Das sumandas@vizagsteel.com
21-22 Dec. 2012	**Hands-on Workshop on SharePoint Server Smart User** CSI Mumbai Chapter at Mumbai	Harshvardhan Mane harsh@csimumbai.org / info@csimumbai.org
21-22 Dec. 2012	**Hands-on Workshop on Wireless Security** CSI Mumbai Chapter at Mumbai http://www.csimumbai.org/Files/Event_Brochure/P-024531veJH2a.pdf	Harshvardhan Mane harsh@csimumbai.org / info@csimumbai.org
January 2013 Events		
3 Jan. 2013	**Regional Round Contest of Yong IT Professional (YITP) Awards - Region-7** CSI Chennai Chapter	Dr. R M Suresh rmsuresh@hotmail.com
11 Jan. 2013	**Workshop on Leadership Skill Training** CSI Mumbai Chapter at Mumbai	Harshvardhan Mane harsh@csimumbai.org / info@csimumbai.org
18 Jan. 2013	**Workshop on Personality Development** CSI Mumbai Chapter at Mumbai	Harshvardhan Mane harsh@csimumbai.org / info@csimumbai.org
19 Jan. 2013	**Regional Round Contest of Yong IT Professional (YITP) Awards- Region-2** CSI Kolkata Chapter	Mr. Deva Prasanna Sinha devaprasannasinha@rediffmail.com
19-20 Jan. 2013	**3rd National Conference on Indian Language Computing** Cochin University of Sc & Tech and CSI Div III, http://dca.cusat.ac.in/ncilc13/	Keerthy A S/Hrishikesh T T cusatncilc@gmail.com
20 Jan. 2013	**Regional Round Contest of Yong IT Professional (YITP) Awards- Region-4** CSI Bhilai Chapter	Mrs. Ranjana Muley rmuley@sail-bhilaisteel.com
21 Jan. 2013	**Hands-on Workshop on Advanced Excel** CSI Mumbai Chapter at Mumbai	Harshvardhan Mane, harsh@csimumbai.org / info@csimumbai.org
23-24 Jan. 2013	**Eighth National Conference of IT for Defense on "Role of Information Technology for Defense Modernization"** NIMHANS Convention Center, Bangalore	Dr. C R Chakravarthy, chakra32@gmal.com Mr. H C Sridhar, ncitd2013@gmail.com
24-27 Jan. 2013	**Workshop on Project Management (PMBOK Guide Version 4.0)** CSI Mumbai Chapter at Mumbai	Harshvardhan Mane harsh@csimumbai.org / info@csimumbai.org
29-31 Jan. 2013	**International Conference on Reliability Infocom Technologies and Optimization (Trends and Future Directions)** Amity Institute of Information Technology Amity University CSI and IEEE	Prof. Sunil Kumar Khatri icrito2013@gmail.com
February 2013 Events		
1 Feb. 2013	**IT2020 - Making Emerging Technologies a Board Room Agenda** The Lalit Hotel	Harshvardhan Mane harsh@csimumbai.org / info@csimumbai.org
1-2 Feb. 2013	**A Southern Regional Conference on Innovation in Information Technology Vizag 2012-13** Computer Society of India, Visakhapatnam Chapter	Suman Das sumandas@vizagsteel.com
7 Feb. 2013	**Regional Round Contest of Yong IT Professional (YITP) Awards- Region-6** CSI Nashik Chapter	Mr. Prashant Patil principal@sandippolytechnic.org
8-9 Feb. 2013	**Regional Conference of Region 6 on "NexGen Computing"** CSI Nashik Chapter	Mr C B Dahale info@csi-nashik.org.in
9 Feb. 2013	**Regional Round Contest of Yong IT Professional (YITP) Awards- Region-3** CSI Ahmedabad Chapter	Mr. Sanjay Parikh Sanjay.Parikh@relianceada.com
16 Feb. 2013	**Regional Round Contest of Yong IT Professional (YITP) Awards- Region-1** Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM) New Delhi and CSI	Prof. M N Hoda mca@bvicam.ac.in
19-20 Feb. 2013	**International Conference on Advance Computing and Creating Entrepreneurs (ACCE2013)** SIG-WNs DivIV and Udaipur Chapter CSI and GITS Udaipur http://www.acce2013.gits.ac.in/	Dr. Dharm Singh, dharm@mpuat.ac.in SanjayMohapatra, smohapatra70@yahoo.co.in Ms. Ridhima Khamesra, ridhima_l@hotmail.com
22 Feb. 2013	**Regional Round Contest of Yong IT Professional (YITP) Awards- Region-5** CSI Bangalore Chapter	Mr. Bindhumadhava bindhu@cdac.in
March 2013 Events		
6 Mar. 2013	**National Round Contest of Yong IT Professional (YITP) Awards** CSI Coimbatore Chapter at PSG College of Technology, Coimbatore, Tamil Nadu	Mr. N Valliappan valliappan@ezvidya.com
6-7 Mar. 2013	**INDIACom - 2013; Seventh National Conference on "Computing for Nation Development"** Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM) New Delhi CSI IEEE ISTE IETE IE (I)	Prof. M N Hoda conference@bvicam.ac.in
8 Mar. 2013	**NSC - 2013; Sixth National Students' Convention on "Computing for Nation Development"** Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM) New Delhi CSIISTE IETE IE (I)	Mrs. Parul Arora nsc@bvicam.ac.in
9-10 Mar. 2013	**International Conference on Information Systems and Computer Networks (ISCON-2013)** CSI Mathura Chapter Division IV & Region-1 at GLA University Mathura www.gla.ac.in/iscon2013	Dr. Dilip Kumar Sharma dilip.sharma@gla.ac.in
9-10 Mar. 2013	**IEEE ISCON 2013; First IEEE International Conference on Information Systems and Computer Networks,** IEEE UP Section India, Division IV, Region-1 & CSI Mathura Chapter at GLA University Mathura, India www.gla.ac.in/ISCON2013	Dr. Dilip Kumar Sharma, dilip.sharma@gla.ac.in Sanjay Mohapatra, div4@csi-india.org Prof. R K Vyas, rkvyas_99@yahoo.com
21-22 Mar. 2013	**National Conference on Communication and Networking for Inclusive Growth** CSI DIV IV (Communications) & CSI Trivandrum Chapter Sarabhai Institute of Science and Technology, Trivandrum http://www.csitvm.org	Dr. C G Sukumaran Nair, cg.sukumarannair@gmail.com Mr. Biju Varghese, bijubv@gmail.com Sanjay Mohapatra, div4@csi-india.org

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ANNOUNCING IT2020

1st Feb 2013 | The Lalit, Mumbai

Making Emerging Technologies a Boardroom Agenda

After a successful event in 2011, CSI Mumbai Chapter is back with its biggest annual event – IT2020. This is the only event of its kind in the region that aims at equipping CXOs, decision makers, influencers and enablers with the relevant knowledge and context of IT. This year it will focus on enabling business through emerging technologies, so as to play a strategic role in the Board Room. We have exciting new speakers who have created a niche for themselves in the IT industry and will have a wealth of knowledge and experience to share. These industry stalwarts will discuss out the key areas of Security, Mobility, Social Media and Big Data so as to identify IT adoption barriers and opportunities as well as provide insight into the forces shaping the four emerging technologies.

TRACK SESSIONS

Security: Information security is all about protecting information and information systems from unauthorised access, use, disclosure, disruption, modification, perusal, inspection, recording or destruction. Protecting confidential information is a business requirement, and in many cases also an ethical and legal requirement. How can virtual business processes be built enabling stakeholders to do seamless business?

Mobility: Mobility is no longer at the fringe of discussions; instead, it lies at the core of strategic agendas. It presents a fresh opportunity for greater productivity, cost savings, and boosted employee morale. To sustain this, how can mobile devices be secured against threats? How can this help customer engagement and employee produc-tivity to improve?

Social Media: Social Media has major implications for the business sector, non-profits, organizations and Corporate India. There are bloggers, Facebook users, Twitter users, Google+ users and most of them post opinions about products and brands, which are often more influential than ads. In such a scenario, what value addition could Social Media made to a company? And how can this help organizations off earn business and improve performance?

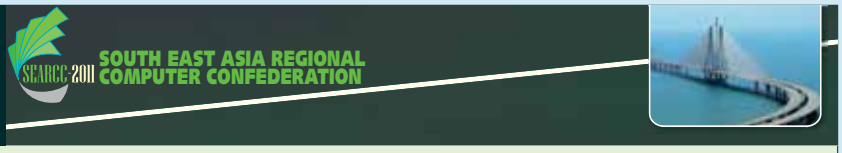
Big Data: For decades, companies have been making business decisions based on transactional data stored in databases. However the less structured data such as weblogs, social media, email, sensors, and photographs is now rendering itself significant. What is the value in Big Data that can be exploited with experimentation and exploration? How can Big Data be used as an opportunity, for insights in voluminous data forms soaring beyond historical record keeping?

REGISTRATION

The event is a must-attend for those interested in using technology to enhance the way they work and impact the boardroom in a powerful and ground-breaking way. If that describes you, you are in the right place. Whether you are a decision maker, a specialist or are simply looking at ways to work better, you will find something that will challenge your perspective and encourage you to innovate.

To register for the event or to know more details, please visit us at **www.csimumbai.org/it2020**

Photos of SEARCC 2011



Mr. M. D. Agrawal
President, CSI,
Conference Chair

Mr. Anthony Wong
President SEARCC 2011

Mr. Sachin Pilot
Hon. Minister of State in the Ministry of Communications and Information Technology(P), Govt. of India

Mr. Milind Deora
Hon. Minister of State in the Ministry of Communications and Information Technology(D), Govt. of India