

Advancements in Technology: What's in beholding for Human Beings?



S.S. Iyengar

IEEE Fellow, ACM Fellow, AAAS Fellow, SDPS Fellow,
Fellow of Transdisciplinary Learning
Roy Paul Daniels Professor and Chairman,
Dept. of Computer Science, Louisiana State University, USA
email: iyengar@csc.lsu.edu

Science fictions of yesteryears are a reality today. We are now living in a unbelievable tech-age. Technology has enabled human beings to fit visual sensing devices on a fly, make hybrid car capable of running on gas as well as electricity, simulate black hole and eventual evolution of Universe using Large Hadron Collider, and BloomEnergy devising Energy Server of the size of bread loaf; capable of satisfying all energy needs at Fortune 500 incorporations like Google, Staples, Bank of America, eBay, Staples, Walmart and more. The digital revolution has even electronic manufacturers competing neck to neck with each other. What's fastest and latest today, takes no time in becoming history the very next day.

Organizations are ever day collecting terabytes of data right from a newborn's heart beats to cars plying on a freeway, from electricity in power grids to patients in a hospital, and even traffic patterns. This huge amount of data warehouses are being used to detect diseases faster and accurately, to reduce energy costs, to systemize transportation system, and virtually making a smarter planet. We really are in an age on Smarter Classes, Smarter Grocery Stores, Smarter Government, Smarter Cars, Smarter Airports, Smarter Hospitals, Smarter Energy Grids, Smarter Trains and a lot more things which are SMART (Self-Monitoring, Analysis,

and Reporting Technology). One of the biggest technological breakthroughs has been nanotechnology, which revolutionized the field of wireless sensor technology. Advances in Micro-Mechanical Systems (MEMS) have allowed integration of sensors, actuators, mechanical elements and wireless communication on a common silicon substrate with the help of micro-fabrication. These sensor nodes are integrated low-cost units, and small form-factor embedded systems. Wireless sensors leading to a robust and scalable Wireless Sensor Networks (WSN) are being successfully used for energy management, battlefield management / surveillance, habitat monitoring, security systems, and so on. The need for self-effacing and remote monitoring is the main motivation for deploying a sensing and communication network consisting of a large number of these battery powered sensor nodes.

WSN have elevated humans to the post of super-humans. We can with help of sensor technology detect presence of deadly chemicals in a vast public space, or even calculate almost accurately the population of a wild species present in an area. Sensors are multiplying daily and at a faster pace than growth of swarm bees in a farm. Sensors today not only provide data for analysis to scientists, but even to primary school going kids to understand our oceans, climate and environment. The major factors which have contributed to tremendous growth in WSN are 1) Dramatic reduction in size of sensors, 2) Wireless nature of sensors, enabling them to operate virtually any place, 3) Ability of sensors to interconnect and form a well knit network, and 4) Reduced power consumption, and in certain case ability to generate required energy from environment itself.

These all developments have been possible because of extensive research work going on in every technological field. Without research human would have been nomad and still living in stone-age. Watchfully controlled and planned research enables scientists to investigate and evaluate different theories and approaches, explore different techniques and devise new ones. Research also enables us to rule out anomalies present within the system setup, or even consider extraneous factors which might affect the final outcome. In order to develop human species further and to reach new pinnacles, there should be a zest within individuals, government and private companies to join forces and promote research beyond what had been done till date.

- Iyengar

Dear Readers, Researchers, and Scholars,

It is the matter of proud privilege of to write few words about Dr. S.S. Iyengar who hardly needs any recognition. Dr. Iyengar, Scientist of International repute, a pioneer in the field of distributed sensor networks, computational aspects of robotics, and oceanographic applications and is best known for his endeavors to transform academic research to commercial applications pertaining to real life. His recent work includes Software Based Event Detection, Preventing Future Oil Spills and World's Best Technology Showcase 2007. More information about him is available at <http://www.csc.lsu.edu/~iyengar/>.

Prof. (Dr.) Dimple Juneja Gupta

Software Based Event Detection



This Complex Event Processing System detects problems in mission critical, real-time applications and generates intelligent decisions to modulate the system environment. This system makes use of a Shell; which is a complex event processing engine. It combines cloud computing with intelligent agents. This system is being used by the military and is being currently explored for licensing with Prases Corporation-Shreveport, USA. Applications of this shell include soil and water management in agriculture, smart grid, etc. More details are available at <http://cacm.acm.org/news/91343-lsu-scientists-develop-new-efficiency-software/fulltext>

World's Best Technology Showcase 2007



"Fast Web Page Allocation on a Server Using Self-Organizing Properties of LSU" This technology was in this highly competitive summit – May 15-18, 2007, Arlington, Texas. It develops a fast competitive neural network learning approach to allocate Web page requests to a cluster of Web servers. The approach performs much better as compared to current approaches to route requests among the distributed Web-server nodes. The optimality of the allocator is obtained through a learning rule where a network adapts to unpredictable changes using the framework of competitive learning.

Preventing Future Oil Spills with Software-Based Event Detection

The team has developed the Cognitive Information Management Shell (CIM Shell), a CEP system that can analyze complex events and activities and adapt rapidly to evolving situations in a wide variety of environments. It provides an analysis and solution to one of the most dangerous man-made disaster-Oil Spills, in particular.

http://www.computer.org/cms/Computer.org/ComputingNow/homepage/2010/0810/rW_CO_PreventingFutureOilSpills.pdf