Vision of the Department:

To produce the professionals of highest grade, bearing the ability to face the challenges posed by latest computing paradigms, founded by intuitive quality of education and driven by culture of critical thinking and creativity, towards the betterment of humankind.

Mission of the Department:

- To Advance knowledge of computing and educate students in major paradigms of computer science
- To create a distinctive culture of research and innovation among the budding engineers with collaboration of faculties, technocrats, funding agencies and experts from other premier institutes
- Generating a pool of professionals and eco-pruners with the ability to address the Industry and social Problems.

PEO's of the Department

PEO 1: To provide graduating students with core competencies by strengthening their mathematical, scientific and basic engineering fundamentals.

PEO 2: To train graduates in diversified and applied areas with analysis, design and synthesis of data to create novel products and solutions to meet current industrial and societal needs.

PEO 3: To inculcate high professionalism among the students by providing technical and soft skills with ethical standards.

PEO 4: To promote collaborative learning and spirit of team work through multidisciplinary projects and diverse professional activities.

PEO 5: To encourage students for higher studies, research activities and entrepreneurial skills by imparting interactive quality teaching and organizing symposiums, conferences, seminars, workshops and technical discussions.

From Guest's desk:

Dear Readers,

Greetings to Department of Computer Science & Engineering!

As a faculty in ITER, and being a computer professional, I regularly follow the different magazines published by different institutions. I first came in touch with DIGIT-ALL in 2013 in the college's website and it impressed me a lot in all the spheres in which facts and articles are published. I as the presenter of an article during this session feel privileged to have been asked to write a message.

It was pleasing to learn that the students of GIFT, CSE department have taken forward such an initiative and are eager and enthusiastic to collect facts and make themselves felt around the world through different articles and other contents. I would like them to continue this effort and try to bring laurels for their institution.

DIGIT-ALL has taken a lot of air even around GIFT and is continuing to spread its wing. I as a computer professional want this effort to multiply itself even more and spread the knowledge all around

Thanks & Regards,

Prof. Kaveri Das

Dept. of CA,

Institute of Technical Education and Research

From the Editor's Pen

Dear Readers,

Greetings from department of computer science and engineering!

We the members of the department of computer science and engineering have always labored for the betterment of the students and the students have repaid back with rich dividends in academics as well as other curricular fields. DIGIT all is one of the many initiatives taken forward with the help of the students for their self betterment and experience in different fields to prosper in life.

DIGIT ALL has so far helped students take long strides in the field of their interest and in coming years will continue to do so.

I am extremely elated and obliged to present before you the fourth volume of DIGIT ALL.

As an editor, I am overjoyed and thankful to one and all who were involved in this effort and am obliged for the support everyone has rendered to help me finish yet another success story.

Thanks & Regards,

Prof. Madhusree Kuanr,

Asst. Prof., Dept. of CSE

Editor, Digit-All

1) Articles

a) Phone-based laser rangefinder works outdoors

b) System loads Web pages 34 percent faster by fetching files more effectively

c) Enabling human-robot rescue teams

d) Cutting down runway queues

e) Machines that learn like people

2) Some Interesting Facts

3) Technical Quiz

4) Cartoons

5) Great Quotes

Articles

➢ Phone-based laser rangefinder works outdoors

(MS. LOPAMUDRA TRIPATHY, 4TH YEAR CSE)

The Microsoft Kinect was a boon to robotics researchers. The cheap, off-the-shelf depth sensor allowed them to quickly and cost-effectively prototype innovative systems that enable robots to map, interpret, and navigate their environments. But sensors like the Kinect, which use infrared light to gauge depth, are easily confused by ambient infrared light. Even indoors, they tend to require low-light conditions, and outdoors, they're hopeless. At the International Conference on Robotics and Automation in May, researchers from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) will present a new infrared depth-sensing system, built from a smartphone with a $10 laser attached to it, that works outdoors as well as in.

The researchers envision that cell phones with cheap, built-in infrared lasers could be snapped into personal vehicles, such as golf carts or wheelchairs, to help render them autonomous. A version of the system could also be built into small autonomous robots, like the package-delivery drones proposed by Amazon, whose wide deployment in unpredictable environments would prohibit the use of expensive laser rangefinders. "My group has been strongly pushing for a device-centric approach to smarter cities, versus today's largely vehicle-centric or infrastructure-centric approach," says Li-Shiuan Peh, a professor of electrical engineering and computer science whose group developed the system. "This is because phones have a more rapid upgrade-and-replacement cycle than vehicles. Cars are replaced in the timeframe of a decade, while phones are replaced every one or two years. This has led to drivers just using phone GPS today, as it works well, is pervasive, and stays up-to-date. I believe the device industry will increasingly drive the future of transportation."

Joining Peh on the paper is first author Jason Gao, an MIT PhD student in electrical engineering and computer science and a member of Peh's group.

"It is exciting to see research institutions and businesses coming up with innovation and technological advances, as it would support Singapore's push for a seamless transport experience," says Lam Wee Shann, director of the Futures Division at Singapore's Ministry of Transport. "MIT's new laser depth-sensing system could help advance the development of self-driving vehicles, bringing us one step closer to their deployment in the near future."

➢ System loads Web pages 34 percent faster by fetching files more effectively

(MR. SAPTARSHI DAS, 3RD YEAR CSE)

There are few things more frustrating than a slow-loading Web page. For companies, what's even worse is what comes after: users abandoning their site in droves. Amazon, for example, estimates that every 100-millisecond delay cuts its profits by 1 percent.

To help combat this problem, researchers from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) and Harvard University have developed a system that decreases page-load times by 34 percent. Dubbed "Polaris," the framework determines how to overlap the downloading of a page's objects, such that the overall page requires less time to load. "It can take up to 100 milliseconds each time a browser has to cross a mobile network to fetch a piece of data," says PhD student Ravi Netravali, who is first author on a paper about Polaris that he will present at this week's USENIX Symposium on Networked Systems Design and Implementation. "As pages increase in complexity, they often require multiple trips that create delays that really add up. Our approach minimizes the number of round trips so that we can substantially speed up a page's load-time." The paper's co-authors include graduate student Ameesh Goyal and professor Hari Balakrishnan, as well as Harvard professor James Mickens, who started working on the project during his stint as a visiting professor at MIT in 2014. The researchers evaluated their system across a range of network conditions on 200 of the world's most popular websites, including ESPN.com, NYTimes.com (*The New York Times),* and Weather.com. Before you type in a URL, your browser doesn't actually know what the page looks like. To load the page, the browser has to reach across the network to fetch "objects" such as

HTML files, JavaScript source code, and images. Once an object is fetched, the browser evaluates it to add the object's content to the page that the user sees.

But it's not quite that simple. Evaluating one object often means having to fetch and evaluate more objects, which are described as "dependencies" of the originals. As an example, a browser might have to execute a file's JavaScript code in order to discover more images to fetch and render. The problem is that browsers can't actually see all of these dependencies because of the way that objects are represented by HTML (the standard format for expressing a webpage's structure). As a result, browsers have to be conservative about the order in which they load objects, which tends to increase the number of cross-network trips and slow down the page load.

Polaris is particularly suited for larger, more complex sites, which aligns nicely with recent trends of modern pages ballooning to thousands of (JavaScript-heavy) objects. The system is also valuable for mobile networks, since those tend to have larger delays than wired networks. "Tracking fine-grained dependencies has the potential to greatly reduce page-load times, especially for low-bandwidth or high-latency connections," says Mark Marron, a senior research software development engineer at Microsoft. "On top of that, the availability of detailed dependence information has a wide range of possible applications, such as tracking the source statement of an unexpected value that led to a crash at runtime."

➢ Enabling human-robot rescue teams

(MS. NIKITA BANARJEE, 3RD YEAR CSE)

Autonomous robots performing a joint task send each other continual updates: "I've passed through a door and am turning 90 degrees right." "After advancing 2 feet I've encountered a wall. I'm turning 90 degrees right." "After advancing 4 feet I've encountered a wall." And so on. Computers, of course, have no trouble filing this information away until they need it. But such a barrage of data would drive a human being crazy. At the annual meeting of the Association for the Advancement of Artificial Intelligence last weekend, researchers at MIT's Computer Science and Artificial

Intelligence Laboratory (CSAIL) presented a new way of modeling robot collaboration that reduces the need for communication by 60 percent. They believe that their model could make it easier to design systems that enable humans and robots to work together.

"We haven't implemented it yet in human-robot teams," says Julie Shah, an associate professor of aeronautics and astronautics and one of the paper's two authors. "But it's very exciting, because you can imagine: You've just reduced the number of communications by 60 percent, and presumably those other communications weren't really necessary toward the person achieving their part of the task in that team." The work could have also have implications for multirobot collaborations that don't involve humans. Communication consumes some power, which is always a consideration in battery-powered devices, but in some circumstances, the cost of processing new information could be a much more severe resource drain.

In a multiagent system — the computer science term for any collaboration among autonomous agents, electronic or otherwise — each agent must maintain a model of the current state of the world, as well as a model of what each of the other agents takes to be the state of the world. These days, agents are also expected to factor in the probabilities that their models are accurate. On the basis of those probabilities, they have to decide whether or not to modify their behaviors.

In the experiments, however, all the agents were electronic. "What I'd be willing to bet, although we have to wait until we do the human-subject experiments, is that the human-robot team will fail miserably if the system is just telling the person all sorts of spurious information all the time," Shah says. "For human-robot teams, I think that this algorithm is going to make the difference between a team that can function effectively versus a team that just plain can't."

"It is well-understood that in human teams, when one team member gains new information, broadcasting this new information to all team members is generally not a good solution, especially when the cost of communication is high," says Tim Miller, an

assistant professor of computing and information systems at the University of Melbourne in Australia.

➢ Cutting down runway queues

(MR. PIYUSH UPADHAYA, 4TH YEAR CSE)

Most frequent fliers are familiar with long lines at airports: at the check-in counter, the departure gate, and in boarding a booked flight. But even after passengers are buckled in, the waiting may continue — when a plane leaves the gate, only to sit on the tarmac, joining a long queue of flights awaiting takeoff. Such runway congestion can keep a plane idling for an hour or more, burning unnecessary fuel.

Now engineers at MIT have developed a queuing model that predicts how long a plane will wait before takeoff, given weather conditions, runway traffic, and incoming and outgoing flight schedules. The model may help air traffic controllers direct departures more efficiently, minimizing runway congestion. For example, if a controller knows that a plane is unlikely to take off for half an hour, he may choose to keep the plane at the gate to avoid contributing to runway backups. Hamsa Balakrishnan, an associate professor of aeronautics and astronautics and engineering systems and an affiliate of the Institute for Data, Systems, and Society at MIT, says that in tests at various U.S. airports, the model encouraged controllers to hold flights back during certain times of day, leading to significant fuel savings.

"In our field tests, we showed that there were some periods of time when you could decrease your taxi time by 20 percent by holding aircraft back," Balakrishnan says. "Each gate-held aircraft saves 16 to 20 gallons of fuel, because it's not idling. And that adds up." Balakrishnan and former graduate student Ioannis Simaiakis have published their results in the journal *Transportation Science*. The team is working on airports across the country to further test the model.

How long until takeoff?

A number of factors can contribute to airport congestion, which can create nose-to-tail traffic jams among departing flights. In 2007, Balakrishnan analyzed departure operations

at John F. Kennedy International Airport, Newark Liberty International Airport, and Philadelphia International Airport, and showed that these hubs were congested 10 to 20 percent of the time: At Newark, passengers traveling during congested periods experienced average runway taxiing times of 52 minutes, versus 14 minutes during less busy periods. Balakrishnan says individual decisions on when planes push back from gates can contribute to the problem.

"In 2022, there's going to be system-wide congestion, and the belief is [that] most of the benefit of airport operations management is going to come from some sort of departure metering," Balakrishnan says. "What you need in order to do departure metering is a way to predict what's actually going to happen, and use that to meter. So we're building the models to help us achieve that."

➢ Machines that learn like people

(MR. NABAGHANA SASMAL, 2ND YEAR CSE)

Object-recognition systems are beginning to get pretty good — and in the case of Facebook's face-recognition algorithms, frighteningly good.

But object-recognition systems are typically trained on millions of visual examples, which is a far cry from how humans learn. Show a human two or three pictures of an object, and he or she can usually identify new instances of it.

Four years ago, Tomaso Poggio's group at MIT's McGovern Institute for Brain Research began developing a new computational model of visual representation, intended to reflect what the brain actually does. And in a forthcoming issue of the journal *Theoretical Computer Science*, the researchers prove that a machine-learning system based on their model could indeed make highly reliable object discriminations on the basis of just a few examples.

In both that paper and another that appeared in October in *PLOS Computational Biology*, they also show that aspects of their model accord well with empirical evidence about how the brain works.

"If I am given an image of your face from a certain distance, and then the next time I see you, I see you from a different distance, the image is quite different, and simple ways to match it don't work," says Poggio, the Eugene McDermott Professor in the Brain Sciences in MIT's Department of Brain and Cognitive Sciences. "In order solve this, you either need a lot of examples — I need to see your face not only in one position but in all possible positions — or you need an invariant representation of an object."
Computer vision researchers have proposed several techniques for invariant object representation, but Poggio's group had the further challenge of finding an invariant representation that was consistent with what we know about the brain's machinery.

The researchers' invariance hypothesis is "a powerful approach to bridge the large gap between contemporary machine learning, with its emphasis on millions of labeled examples, and the primate visual system that in many instances can learn from a single example," says Christof Koch, president and chief scientific officer of the Allen Institute for Brain Science.

The researchers' work was sponsored, in part, by MIT's Center for Brains, Minds, and Machines, which is funded by the National Science Foundation and directed by Poggio.

Shortie:
Computer Assisted Education

(MR. AMAN ARYA, 3RD YEAR CSE)

The use of computers and software to assist education and/or training, computer-assisted education brings many benefits and has many uses. For students with learning disabilities, for instance, it can provide personalized instruction and enable students to learn at their own pace, freeing the teacher to devote more time to each individual. The field is still growing but promising, with many educators praising its ability to allow students to engage in active, independent and play-based learning.

SOME INTERESTING FACTS

By: Mr. Ujjwal Kumar
4th Year CSE

- The first domain name ever registered was Symbolics.com.
- U.S. President Bill Clinton's inauguration in January 1997 was the first to be webcast.
- Doug Engelbart had made the first computer mouse in 1964, and it was made out of wood.
- Every minute, 10 hours of videos are uploaded on You tube.
- While it took the radio 38 years, and the television a short 13 years, it took the World Wide Web only 4 years to reach 50 million users.
- 'Stewardesses' is the longest word which can be typed with only the left hand.
- If you were to remove all of the empty space from the atoms that make up every human on earth, the entire world population could fit into an apple.
- Google uses an estimated 15 billion kWh of electricity per year, more than most countries. However, Google generates a lot of their own power with their solar panels.

Proverbios

If the automobile had followed the same development cycle as the computer, a Rolls-Royce would today cost $100, get a million miles per gallon, and explode once a year, killing everyone inside.

-- Robert X. Cringely

TECHNICAL QUIZ

BY: Ms. Priya Dey
3rd Year CSE

1) A technique used by codes to convert an analog signal into a digital bit stream is known as

A. Pulse code modulation
B. Pulse stretcher
C. Query processing
D. Queue management
E. None of the above

2) An optical input device that interprets pencil marks on paper media is

A. O.M.R
B. Punch card reader
C. Optical scanners
D. Magnetic tape
E. None of the above

3) Most important advantage of an IC is its

A. Easy replacement in case of circuit failure
B. Extremely high reliability
C. Reduced cost
D. Low power consumption
E. None of the above

4) Data division is the third division of a ____program.

A. COBOL
B. BASIC
C. PASCAL
D. FORTH
E. None of the above

5) Which language was devised by Dr. Seymour Cray?

A. APL
B. COBOL
C. LOGO
D. FORTRAN
E. None of the above

6) A program that converts computer data into some code system other than the normal one is known as

A. Encoder
B. Simulation
C. Emulator
D. Coding

7) A device designed to read information encoded into a small plastic card is

A. Magnetic tape
B. Badge reader
C. Tape puncher
D. Card puncher
E. None of the above

8) A hybrid computer uses a ____ to convert digital signals from a computer into analog signals.

A. Modulator
B. Demodulator
C. Modem
D. Decoder
E. None of the above

9) A group of magnetic tapes, videos or terminals usually under the control of one master is

A. Cylinder
B. Cluster
C. Surface
D. Track
E. None of the above

10) Any device that performs signal conversion is

A. Modulator
B. Modem
C. Keyboard
D. Plotter

11) Codes consisting of light and dark marks which may be optically read is known as

A. Mnemonics
B. Bar code
C. Decoder
D. All of the above

12) A type of channel used to connect a central processor and peripherals which uses multiplying is known as

A. Modem
B. Network
C. Multiplexer
D. All of the above
E. None of the above

13) Which of the following computer language is used for artificial intelligence?

A. FORTRAN
B. PROLOG

C. C D. COBOL
E. None of the above

14) The tracks on a disk which can be accessed without repositioning the R/W heads is

A. Surface B. Cylinder
C. Cluster D. All of the above

15) With respect to a network interface card, the term 10/100 refers to

A. protocol speed B. a fiber speed
C. megabits per second D. minimum and maximum server speed
E. None of the above

16) Which Motherboard form factor uses one 20 pin connector?

A. ATX B. AT
C. BABY AT D. All of the above
E. None of the above

17) Process is

A. program in High level language kept on disk B. contents of main memory
C. a program in execution D. a job in secondary memory
E. None of the above

18) Which of the following condition is used to transmit two packets over a medium at the same time?

A. Contention B. Collision
C. Synchronous D. Asynchronous
E. None of the above

19) Addressing structure

A. defines the fundamental method of determining effective operand addresses
B. are variations in the use of fundamental addressing structures, or some associated actions which are related to addressing.
C. performs indicated operations on two fast registers of the machine and leave the result in one of the registers.
D. all of the above

Answers

1. A
2. A
3. B
4. A
5. C
6. A
7. B
8. C
9. B
10. A
11. B
12. C
13. B
14. B
15. C
16. A
17. C
18. B
19. A

CARTOONS

By: Ms. Satarupa Uttarkabata
4th Year CSE

First time for Everything .. !!

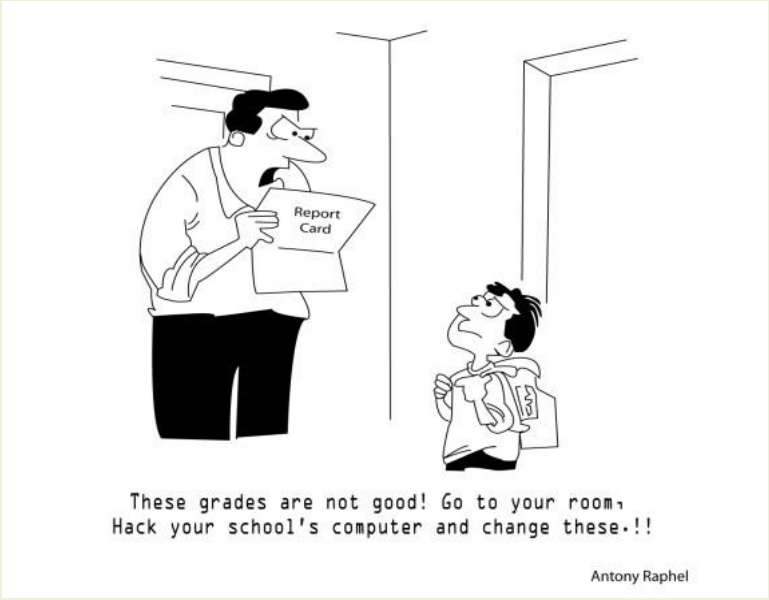
Computers are useless. They can only give you answers.

Pablo Picasso

Computers are like Old Testament gods; lots of rules and no mercy.

Joseph Campbell

Networksecurity at threat….!!



Great Quotes:

By: Ms. Sonali Nanda
2nd Year CSE

"Now, 75 years [after To Kill a Mockingbird], in an abundant society where people have laptops, cell phones, iPods, and minds like empty rooms, I still plod along with books. [Open Letter, O Magazine, July 2006]"

– Harper Lee

That the state of knowledge in any country will exert a directive influence on the general system of instruction adopted in it, is a principle too obvious to require investigation.

– Charles Babbage

"UNIX is basically a simple operating system, but you have to be a genius to understand the simplicity."

– Dennis Ritchie