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 the HOD'S Pen

Dear Readers,

Greetings from Department of Computer Science & Engineering!

As a department of Computer Science & Engineering, We have always strived to provide a well rounded curriculum and training to our students and prepare them to meet the challenges they face ahead in their professional life after they graduate from here. Various student driven initiatives, apart from regular academic curriculum, ensures that student at GIFT get an overall development of their overall personality. DIGIT-ALL is one such initiative.

As a half yearly magazine of GIFT, it helps the students to interact and share their ideas with the industry leaders and their peers studying in the college.

It brings me immense pleasure to bring the first issue of the DIGIT-ALL to you.

I thank everyone for their valuable contributions to the magazine and hope to receive similar enthusiasm through your precious insight in the fourth coming issues of DIGIT-ALL.

Thanks & Regards,

Prof. Pratyush Ranjan Mohapatra

H.O.D, CSE

Gandhi Institute For Technology, Bhubaneswar

From the Editor's Pen

Dear Readers,

Greetings from Department of Computer Science & Engineering!

It brings me immense pleasure to bring the second issue of the DIGIT-ALL to you. DIGIT-ALL has only just begun to explore the potential of the new digital media. I look forward to some awesome output from our students in the coming years. And I wait with bated breath for Best of this year's to have a laugh, turn a thought, and to try and form a mental picture of what we really are like.

Campus magazine is important not just for capturing the currents and moods of the time, but also because they are an archive we can visit later to view ourselves from the distance that the years will bring. I am glad DIGIT-ALL is putting together literary pieces and reviews of the major contributions of GIFT.

DIGIT-ALL is by the students, of the students and for the students to bring out their creative skills.

I can just thank and congratulate everyone involved in making this effort a grand success by contributing their articles to spread knowledge and to all of those who have put their heart into this.

Thanks & Regards,

Prof. Sujit Panda,

Assoc. Prof., Dept. of CSE

Editor, Digit-All

Articles

Device allows a personal computer to process huge graphs

(Ms. Ravina Kumari, 2nd year CSE)

In data-science parlance, graphs are structures of nodes and connecting lines that are used to map scores of complex data relationships. Analyzing graphs is useful for a broad range of applications, such as ranking webpages, analyzing social networks for political insights, or plotting neuron structures in the brain. Consisting of billions of nodes and lines, however, large graphs can reach terabytes in size. The graph data are typically processed in expensive dynamic random access memory (DRAM) across multiple power-hungry servers. Researchers from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) have now designed a device that uses cheap flash storage — the type used in smartphones — to process massive graphs using only a single personal computer. Flash storage is typically far slower than DRAM at processing graph data. But the researchers developed a device consisting of a flash chip array and computation "accelerator," that helps flash achieve DRAM-like performance. Powering the device is a novel algorithm that sorts all access requests for graph data into a sequential order that flash can access quickly and easily. It also merges some requests to reduce the overhead — the combined computation time, memory, bandwidth, and other computing resources — of sorting.

In graph analytics, a system will basically search for and update a node's value based on its connections with other nodes, among other metrics. In webpage ranking, for instance, each node represents a webpage. If node A has a high value and connects to node B, then node B's value will also increase. Traditional systems store all graph data in DRAM, which makes them fast at processing the data but also expensive and power-hungry. Some systems offload some data storage to flash, which is cheaper but slower and less efficient, so they still require substantial amounts of DRAM.

Because the host can be so low-powered, Jun says, a long-term goal is to create a general-purpose platform and software library for consumers to develop their own

algorithms for applications beyond graph analytics. "You could plug this platform into a laptop, download [the software], and write simple programs to get server-class performance on your laptop," he says.

Teaching chores to an artificial agent

(Ms. Larisa Priya, 3rd year CSE)

For many people, household chores are a dreaded, inescapable part of life that we often put off or do with little care. But what if a robot assistant could help lighten the load? Recently, computer scientists have been working on teaching machines to do a wider range of tasks around the house. In a new paper spearheaded by MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) and the University of Toronto, researchers demonstrate "Virtual Home," a system that can simulate detailed household tasks and then have artificial "agents" execute them, opening up the possibility of one day teaching robots to do such tasks. The team trained the system using nearly 3,000 programs of various activities, which are further broken down into subtasks for the computer to understand. A simple task like "making coffee," for example, would also include the step "grabbing a cup." The researchers demonstrated VirtualHome in a 3-D world inspired by the Sims video game.

The team's artificial agent can execute 1,000 of these interactions in the Sims-style world, with eight different scenes including a living room, kitchen, dining room, bedroom, and home office.

Once the programs were created, the team fed them to the VirtualHome 3-D simulator to be turned into videos. Then, a virtual agent would execute the tasks defined by the programs, whether it was watching television, placing a pot on the stove, or turning a toaster on and off. The end result is not just a system for training robots to do chores, but also a large database of household tasks described using natural language. Companies like Amazon that are working to develop Alexa-like robotic systems at home could eventually use data like these to train their models to do more complex tasks.

Gearing up for the internet of things

(Mr. Ayush Singh, 4th year CSE)

Telecommunications is gearing up for explosive growth of the internet of things (IoT), the massive collection of devices — smart watches, smart thermostats, traffic and energy monitors, etc. — that will be given network connectivity so that they can communicate and exchange data. The big question raised by the IoT is capacity: How can a telecommunications network with limited spectrum serve thousands or millions of devices at once? Existing networks cannot support the addition of exponentially more devices, nor the near-instantaneous connection speed necessary for machine-to-machine communication. The next-generation network, 5G, must be designed to meet these requirements. How to prepare global wireless networks for the IoT was the topic of discussion at the National Science Foundation Workshop on Low-Latency Wireless Random-Access, hosted by MIT's Laboratory for Information and Decision Systems (LIDS)

and sponsored by theNational Science Foundation (NSF) and the Center for the Science of Information (CSoI). The two-day event took place on the MIT campus in early November, and more than 20 speakers from MIT, other universities, and companies including Qualcomm, SigFox, and Huawei presented their work on how to solve the network challenges created by the IoT.

Another big challenge for the IoT is that it requires extremely low latency, or lag. As anyone who has used the internet knows, data don't always transmit at the speed you want them to. And although a half-loaded video or delayed text may be a pain for humans, for machines even a few milliseconds of lag can have serious consequences. A smart car interpreting traffic data, for instance, cannot afford any lag. This is why the goal for 5G is an ambitious one millisecond latency between devices.

These issues were discussed at length during the workshop. Two sessions were dedicated to information theory, with academic speakers sharing their models for better massive machine-type communications. Sessions also covered topics including reliability and security. "We don't have one thing to solve, we have many things to solve," said the first speaker of the event, Christophe Fourtet, co-founder and chief science officer of telecommunications company SigFox.

Presenter Swarun Kumar, assistant professor at Carnegie Mellon University and an MIT alumnus, echoed Polyanskiy's sentiments. "The time from academic research to industry in this field is too slow," Kumar said. He made an appeal to the members of industry present at the workshop to reach out to him and other academics, noting that they could solve problems more efficiently together. Kumar presented a local network that he and colleagues at Carnegie Mellon had implemented around the campus as a proof-of-concept for their innovations to network infrastructure.

After each set of presentations, speakers returned to the front of the room for a panel Q&A, and in between sessions, speakers and attendees had a chance to mingle and talk over refreshments. The event organizers affirmed that these moments were some of the

most valuable of the workshop: a chance for everyone present to open up dialogue and, perhaps, plant the seeds of collaborations that will build a better network.

Faster big-data analysis

(Mr. Bipasa Mohapatra, 3rd year CSE)

We live in the age of big data, but most of that data is "sparse." Imagine, for instance, a massive table that mapped all of Amazon's customers against all of its products, with a "1" for each product a given customer bought and a "0" otherwise. The table would be mostly zeroes. With sparse data, analytic algorithms end up doing a lot of addition and multiplication by zero, which is wasted computation. Programmers get around this by writing custom code to avoid zero entries, but that code is complex, and it generally applies only to a narrow range of problems.

The system is called Taco, for tensor algebra compiler. In computer-science parlance, a data structure like the Amazon table is called a "matrix," and a tensor is just a higher-dimensional analogue of a matrix. If that Amazon table also mapped customers and products against the customers' product ratings on the Amazon site and the words used in their product reviews, the result would be a four-dimensional tensor. Taco also uses an efficient indexing scheme to store only the nonzero values of sparse tensors. With zero entries included, a publicly released tensor from Amazon, which maps customer ID numbers against purchases and descriptive terms culled from reviews, takes up 107 exabytes of data, or roughly 10 times the estimated storage capacity of all of Google's servers. But using the Taco compression scheme, it takes up only 13 gigabytes — small enough to fit on a smartphone.

"Their compiler now enables application developers to specify very complex sparse matrix or tensor computations in a very easy and convenient high-level notation, from which the compiler automatically generates very efficient code," he continues. "For several sparse computations, the generated code from the compiler has been shown to be comparable or better than painstakingly developed manual implementations. This has

the potential to be a real game-changer. It is one of the most exciting advances in recent times in the area of compiler optimization."

Can artificial intelligence learn to scare us?

(Mr. Manoj Kumar Sahoo, 4th year CSE)

Just in time for Halloween, a research team from the MIT Media Lab's Scalable Cooperation group has introduced Shelley: the world's first artificial intelligence-human horror story collaboration. Shelley, named for English writer Mary Shelley — best known as the author of "Frankenstein: or, the Modern Prometheus" — is a deep-learning powered artificial intelligence (AI) system that was trained on over 140,000 horror stories on Reddit's infamous r/nosleep subreddit. She lives on Twitter, where every hour, @shelley_ai tweets out the beginning of a new horror story and the hashtag #yourturn to invite a human collaborator. Anyone is welcome to reply to the tweet with the next part of the story, then Shelley will reply again with the next part, and so on. The results are weird, fun, and unpredictable horror stories that represent both creativity and collaboration — traits that explore the limits of artificial intelligence and machine learning. "Shelley is a combination of a multi-layer recurrent neural network and an online learning algorithm that learns from crowd's feedback over time," explains Pinar Yanardhag, the project's lead researcher. Shelley starts stories based on the AI's own learning dataset, but she responds directly to additions to the story from human contributors — which, in turn, adds to her knowledge base. Each completed story is then collected on the Shelley project website.

"Shelley's creative mind has no boundaries," the research team says. "She writes stories about a pregnant man who woke up in a hospital, a mouth on the floor with a calm smile, an entire haunted town, a faceless man on the mirror … anything is possible!"

One final note on Shelley: The AI was trained on a subreddit filled with adult content, and the researchers have limited control over her — so parents beware.

Interesting Facts

By: Ms. Swati Kumari, 4th year CSE

- Over 6,000 new computer viruses are released every month.
- The first computer mouse, constructed in 1964, was made out of wood.(by Doug Engelbart)
- The average human being blinks 20 times a minute – but only 7 times a minute when using a computer.
- The first electro-mechanical computer was developed in 1939.
- By the end of 2012 there will be 17 billion devices connected to the internet.
- 5 out of every 6 internet pages are porn related.
- Over 1 million domain names are registered every month.
- With its 800 million interent users, Facebook would be the third largest country in the World.
- The first hard drive was created in 1979 and could hold 5MB of data.
- The nVidia GeForce 6800 Ultra video card contains 222 million transistors.
- Symbolics.com was the first ever domain name to be registered.
- 80% of the emails sent daily are spammy.
- SanDisk was earlier known as SunDisk.
- Until September 1995, domain registration was free.
- 'Electronic brains'! That's what computers were called in the 1950s.
- One can type 20 times faster using a Dvorak keyboard as compared to using a Qwerty keyboard.

proverbios

Between the devil and the sea: To choose between two equally bad alternatives and in a serious state of dilema

Technical Quiz

BY: Mr. Niranjan Patra, 2nd Year CSE

1. Which of the following is the 1's complement of 10?

A. 01 B. 110
C. 11 D. 10

2. A section of code to which control is transferred when a processor is interrupted is known as

A. M B. SVC
C. IP D. MDR

3. A hard disk is divided into tracks which are further subdivided into:

A. clusters B. sectors
C. vectors D. heads
E. None of the above

4. A wrist grounding strap contains which of the following:

A. Surge protector B. Capacitor
C. Voltmeter D. Resistor
E. None of the above

5. The strategy of allowing processes that are logically runnable to be temporarily suspended is called

A. preemptive scheduling B. non preemptive scheduling
C. shortest job first D. first come first served

6. What are the most commonly used transmission speeds in BPS used in data communication?

A. 300 B. 1200
C. 2400 D. 9600
E. None of the above

7. What is the default subnet mask for a class C network?

A. 127.0.0.1
B. 255.0.0.0
C. 255.255.0.0
D. 255.255.255.0

8. The Memory Buffer Register (MBR)

A. is a hardware memory device which denotes the location of the current instruction being executed.
B. is a group of electrical circuits (hardware), that performs the intent of instructions fetched from memory.
C. contains the address of the memory location that is to be read from or stored into.
D. contains a copy of the designated memory location specified by the MAR after a "read" or the new contents of the memory prior to a "write".

9. What is the language used by most of the DBMSs for helping their users to access data?

A. High level language
B. Query language
C. SQL
D. 4GL

10. Data item characteristics that are important in data management include

A. punctuation
B. language
C. spelling
D. width

11. What TCP/IP protocol is used for remote terminal connection service?

A. UDP
B. RARP
C. FTP
D. TELNET

12. How many networks and nodes per network, are allowed by the Class B network?

A. 127 networks and 16,777,216 nodes per network
B. 16,384 networks and 65,534 nodes per network
C. 2,097,152 networks and 254 nodes per network
D. All of the above

13. A ……. is a collection of data that is stored electronically as a series of records in a table.

(A) spreadsheet
(B) presentation
(C) database
(D) MS Word

14. A ……. is measure the speed of super computer.

(A) Mbps
(B) Giga hertz
(C) Flops
(D) Cache Memory

15. Which of the following memories is an optical memory?

(A) Floppy Disk
(B) Bubble Memories
(C) CD–ROM
(D) Core Memories

16. DNS refers to

(A) Data Number Sequence
(B) Digital Network Service
(C) Domain Name System
(D) Disk Numbering System

17. The unit of speed used for super computer is

(A) KELOPS
(B) GELOPS
(C) MELOPS
(D) None of these

18. Whose trademark is the operating system UNIX?

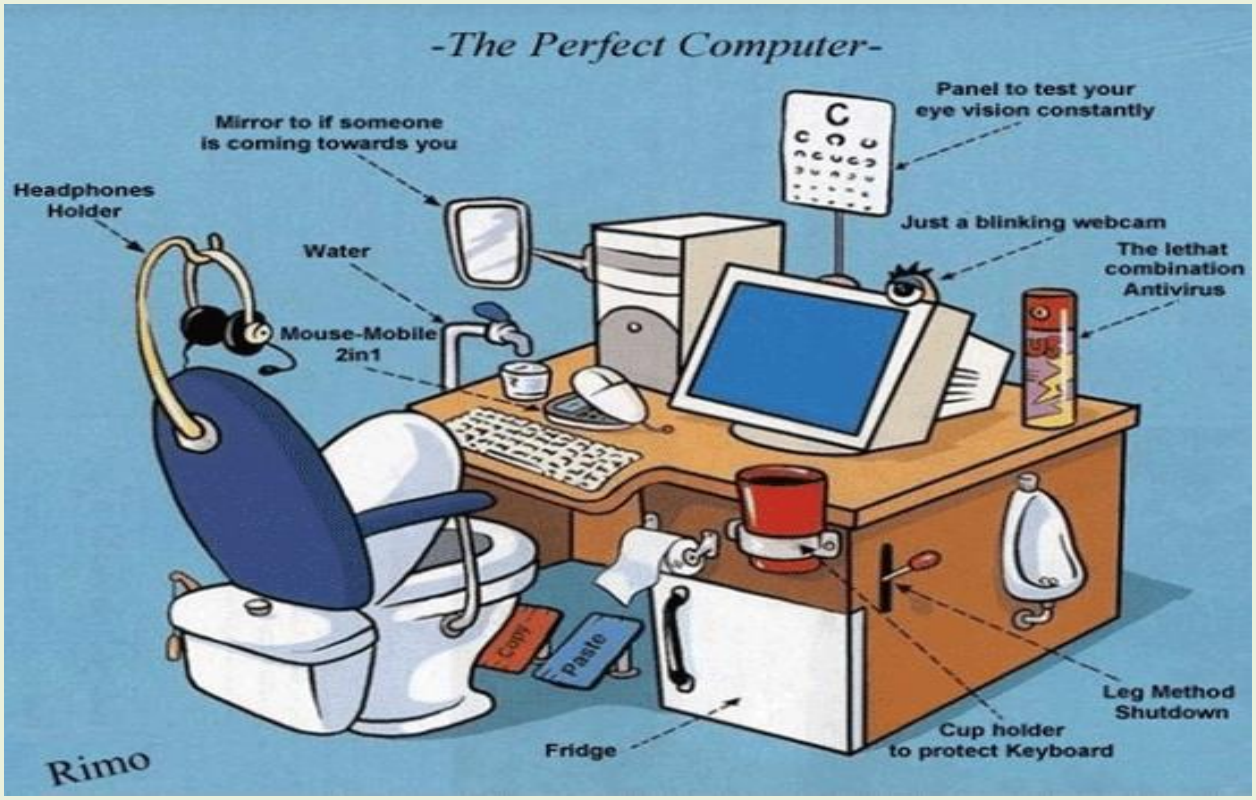
(A) Motorola
(B) Microsoft
(C) BELL Laboratories
(D) Ashton Tate

Answers

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

Computer Cartoons...

BY: Mr. Nihar Mandal, 2nd Year CSE



Quotes

BY: Ms. Ruchika Rajguru, 3rd Year CSE

Technology has forever changed the world we live in. We're online, in one way or another, all day long. Our phones and computers have become reflections of our personalities, our interests, and our identities. They hold much that is important to us.

James Comey Phones

I am thankful the most important key in history was invented. It's not the key to your house, your car, your boat, your safety deposit box, your bike lock or your private community. It's the key to order, sanity, and peace of mind. The key is 'Delete.'

Elayne Boosler

What is Apple, after all? Apple is about people who think 'outside the box,' people who want to use computers to help them change the world, to help them create things that make a difference, and not just to get a job done.

Steve Jobs