## 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. Madhusree Kuanr,

Asst. Prof., Dept. of CSE

Editor, Digit-All

1) Articles

a) Testing new networking protocols
b) Making better decisions when outcomes are uncertain
c) Wearable AI system can detect a conversation's tone
d) SMART automation
e) Split-second data mapping

2) Some Interesting Facts

3) Technical Quiz

4) Cartoons

5) Great Quotes

Articles

## Testing new networking protocols

(MR. ARMAN SINGH, 4TH YEAR CSE)

The transmission control protocol, or TCP, which manages traffic on the internet, was first proposed in 1974. Some version of TCP still regulates data transfer in most major data centers, the huge warehouses of servers maintained by popular websites. That's not because TCP is perfect or because computer scientists have had trouble coming up with possible alternatives; it's because those alternatives are too hard to test. The routers in data center networks have their traffic management protocols hardwired into them. Testing a new protocol means replacing the existing network hardware with either reconfigurable chips, which are labor-intensive to program, or software-controlled routers, which are so slow that they render large-scale testing impractical. At the Usenix Symposium on Networked Systems Design and Implementation later this month, researchers from MIT's Computer Science and Artificial Intelligence Laboratory will present a system for testing new traffic management protocols that requires no alteration to network hardware but still works at realistic speeds — 20 times as fast as networks of software-controlled routers. The system maintains a compact, efficient computational model of a network running the new protocol, with virtual data packets that bounce around among virtual routers. On the basis of the model, it schedules transmissions on the real network to produce the same traffic patterns. Researchers could thus run real web applications on the network servers and get an accurate sense of how the new protocol would affect their performance.

"The way it works is, when an endpoint wants to send a [data] packet, it first sends a request to this centralized emulator," says Amy Ousterhout, a graduate student in electrical engineering and computer science (EECS) and first author on the new paper. "The emulator emulates in software the scheme that you want to experiment with in your network. Then it tells the endpoint when to send the packet so that it will arrive at its destination as though it had traversed a network running the programmed scheme."

Ousterhout is joined on the paper by her advisor, Hari Balakrishnan, the Fujitsu Professor in Electrical Engineering and Computer Science; Jonathan Perry, a graduate student in EECS; and Petr Lapukhov of Facebook.

"Being able to try real workloads is critical for testing the practical impact of a network design and to diagnose problems for these designs," says Minlan Yu, an associate professor of computer science at Yale University. "This is because many problems happen at the interactions between applications and the network stack" — the set of networking protocols loaded on each server — "which are hard to understand by simply simulating the traffic." "Flexplane takes an interesting approach of sending abstract packets through the emulated data-plane resource management solutions and then feeding back the modified real packets to the real network," Yu adds. "This is a smart idea that achieves both high link speed and programmability.

## Making better decisions when outcomes are uncertain

(MR. AMRIT MOHAPATRA, 4TH YEAR CSE)

Markov decision processes are mathematical models used to determine the best courses of action when both current circumstances and future consequences are uncertain. They've had a huge range of applications — in natural-resource management, manufacturing, operations management, robot control, finance, epidemiology, scientific-experiment design, and tennis strategy, just to name a few. But analyses involving Markov decision processes (MDPs) usually make some simplifying assumptions. In an MDP, a given decision doesn't always yield a predictable result; it could yield a range of possible results. And each of those results has a different "value," meaning the chance that it will lead, ultimately, to a desirable outcome. Characterizing the value of given decision requires collection of empirical data, which can be prohibitively time consuming, so analysts usually just make educated guesses. That means, however, that the MDP analysis doesn't guarantee the best decision in all cases.

In the Proceedings of the Conference on Neural Information Processing Systems, published last month, researchers from MIT and Duke University took a step toward putting MDP analysis on more secure footing. They show that, by adopting a simple trick long known in statistics but little applied in machine learning, it's possible to accurately characterize the value of a given decision while collecting much less empirical data than had previously seemed necessary. In their paper, the researchers described a simple example in which the standard approach to characterizing probabilities would require the same decision to be performed almost 4 million times in order to yield a reliable value estimate. With the researchers' approach, it would need to be run 167,000 times. That's still a big number — except, perhaps, in the context of a server farm processing millions of web clicks per second, where MDP analysis could help allocate computational resources. In other contexts, the work at least represents a big step in the right direction.

"The results in the paper, as with most results of this type, still reflect a large degree of pessimism because they deal with a worst-case analysis, where we give a proof of correctness for the hardest possible environment," says Marc Bellemare, a research scientist at the Google-owned artificial-intelligence company Google DeepMind. "But that kind of analysis doesn't need to carry over to applications. I think Jason's approach, where we allow ourselves to be a little optimistic and say, 'Let's hope the world out there isn't all terrible,' is almost certainly the right way to think about this problem. I'm expecting this kind of approach to be highly useful in practice."

The work was supported by the Boeing Company, the U.S. Office of Naval Research, and the National Science Foundation.

## Wearable AI system can detect a conversation's tone

(MR. ABHISHEK MISHRA, 3RD YEAR CSE)

It's a fact of nature that a single conversation can be interpreted in very different ways. For people with anxiety or conditions such as Asperger's, this can make social situations extremely stressful. But what if there was a more objective way to measure and understand our interactions? Researchers from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) and Institute of Medical Engineering and Science (IMES) say that they've gotten closer to a potential solution: an artificially intelligent, wearable system that can predict if a conversation is happy, sad, or neutral based on a person's speech patterns and vitals.

Alhanai notes that, in traditional neural networks, all features about the data are provided to the algorithm at the base of the network. In contrast, her team found that they could improve performance by organizing different features at the various layers of the network. "The system picks up on how, for example, the sentiment in the text transcription was more abstract than the raw accelerometer data," says Alhanai. "It's quite remarkable that a machine could approximate how we humans perceive these interactions, without significant input from us as researchers."

## SMART automation

(MS. SRADHANJALI PATTNAIL, 3RD YEAR CSE)

Daniela Rus loves Singapore. As the MIT professor sits down in her Frank Gehry-designed office in Cambridge, Massachusetts, to talk about her research conducted in Singapore, her face starts to relax in a big smile. Her story with Singapore started in the summer of 2010, when she made her first visit to one of the most futuristic and forward-looking cities in the world. "It was love at first sight," says the Andrew (1956) and Erna Viterbi Professor of Electrical Engineering and Computer Science and the director of MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL). That summer, she came to Singapore to join the Singapore-MIT Alliance for Research and Technology (SMART)

as the first principal investigator in residence for the Future of Urban Mobility Research Program.

"In 2010, nobody was talking about autonomous driving. We were pioneers in developing and deploying the first mobility on demand for people with self-driving golf buggies," says Rus. "And look where we stand today! Every single car maker is investing millions of dollars to advance autonomous driving. Singapore did not hesitate to provide us, at an early stage, with all the financial, logistical, and transportation resources to facilitate our work." Since her first visit, Rus has returned each year to follow up on the research, and has been involved in leading revolutionary projects for the future of urban mobility. "Our team worked tremendously hard on self-driving technologies, and we are now presenting a wide range of different devices that allow autonomous and secure mobility," she says. "Our objective today is to make taking a driverless car for a spin as easy as programming a smartphone. A simple interaction between the human and machine will provide a transportation butler."

Daniela Rus, a Class of 2002 MacArthur Fellow and member of the USA National Academy of Engineering, knows that each successful step into urban mobility will bring a positive contribution of artificial intelligence to the public. According to the World Health Organization, 3,400 people die each day in the world from traffic-related accidents. "It is a new space race," she says, convinced that autonomy is part of the solution to safe transportation.

Daniela Rus will continue visiting her beloved Singapore, where she particularly enjoys the food, the beautiful flowers, the kindness of its people, and the smartness of its youth. "Singapore is definitely a model in many fields," she concludes.

## Split-second data mapping

(MS. SOUBHAGYABATI DAS, 2ND YEAR CSE)

People generally associate graphic processing units (GPUs) with imaging processing. Developed for video games in the 1990s, modern GPUs are specialized circuits with thousands of small, efficient processing units, or "cores," that work simultaneously to rapidly render graphics on screen. But for the better part of a decade, GPUs have also found general computing applications. Because of their incredible parallel-computing speeds and high-performance memory, GPUs are today used for advanced lab simulations and deep-learning programming, among other things.

The idea for MapD came to Mostak when he was at Harvard University in 2012, writing his political-science master's thesis on the Arab Spring, and analyzing hundreds of millions of Egyptian tweets sent out during the uprisings. Using CPU-based database-management systems to analyze the data was a time-waster. Often he would run queries overnight and wake up to find an error, meaning the long process would need to be repeated. "It was a frustrating experience," Mostak says.

At the time, Mostak was also taking a CSAIL database course taught by the co-directors of the MIT Database Group: Michael Stonebraker, an adjunct professor in computer science who founded the pioneering database-management company Vertica; and Sam Madden, a professor of electrical engineering and computer science who serves as a MapD advisor.

In January 2014, Mostak officially launched MapD. Joining ILP's Startup Exchange, an online community for MIT-affiliated startups to connect with each other and with other companies, "put [MapD] on the map with commercial entities," Mostak says.

Today, MapD is expanding in its new San Francisco headquarters. It's also looking to capitalize on an increased user base, as more companies start launching .

# SOME INTERESTING FACTS

By: Mr. Soumya Siddhanta Lenka, 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. Debipriya Das, 4th 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

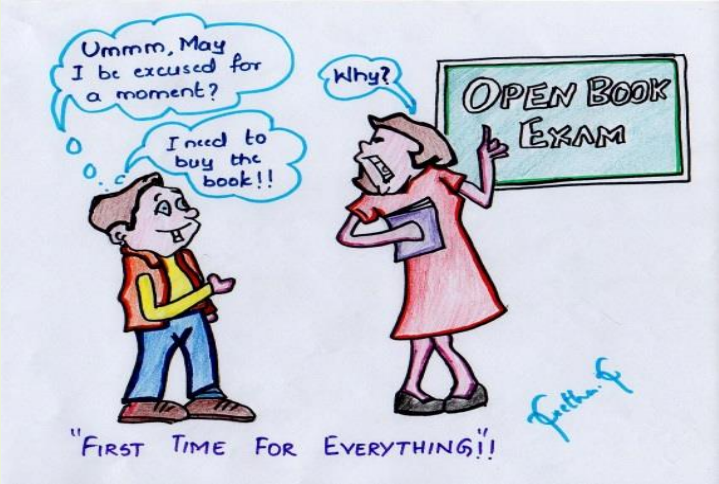
**Answers**

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: Mr. Soumya Siddhanta Lenka, 4th Year CSE

First time for Everything .. !!



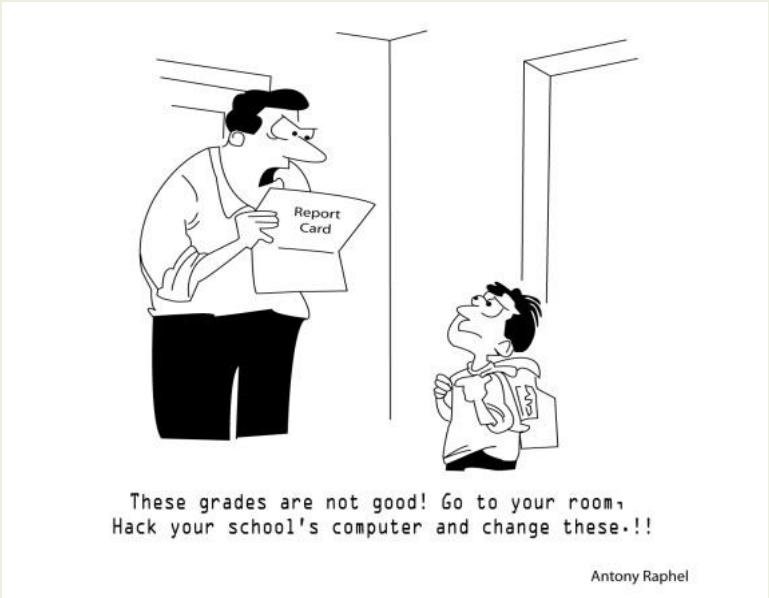

*Computers are useless. They can only give you answers.*

**Pablo Picasso**

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

**Joseph Campbell**

Network security at threat….!!



## Great Quotes:

By: Ms. Rosalin Behera, 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**