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 Principal's desk:

Dear Readers,

Greetings from Gandhi Institute For Technology!

We at the Gandhi Institute for Technology have always been focused on our goal of achieving the heights of the sky taking along with us the rest of the world. All the co-curricular activities taken forward by the students and the teachers is aimed at just one target of overall development of the students, DIGIT ALL being one of them.

DIGIT ALL being a half yearly magazine of GIFT from the school of computer science and engineering has and will continue to help the students to relate themselves as well as share their ideas with their teachers and with the environment in which they are studying in the college.

With utmost pleasure in my heart, I bring before you the third volume of DIGIT ALL.

Thanking everyone involved in this journey so far is just a humble approach from my side towards expressing my gratitude for giving me this moment and making me feel proud to be a GIFTIAN.

Thanks & Regards,

Prof.(Dr) S. Krishna Mohan Rao

Principal,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

Vol. 6
Iss.2

➢ Making computers explain themselves

(Mr. Ravi Kumar Mali, 2nd year CSE)

In recent years, the best-performing systems in artificial-intelligence research have come courtesy of neural networks, which look for patterns in training data that yield useful predictions or classifications. A neural net might, for instance, be trained to recognize certain objects in digital images or to infer the topics of texts. But neural nets are black boxes. After training, a network may be very good at classifying data, but even its creators will have no idea why. With visual data, it's sometimes possible to automate experiments that determine which visual features a neural net is responding to. But text-processing systems tend to be more opaque. At the Association for Computational Linguistics' Conference on Empirical Methods in Natural Language Processing, researchers from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) will present a new way to train neural networks so that they provide not only predictions and classifications but rationales for their decisions.

Neural networks are so called because they mimic — approximately — the structure of the brain. They are composed of a large number of processing nodes that, like individual neurons, are capable of only very simple computations but are connected to each other in dense networks. In a process referred to as "deep learning," training data is fed to a network's input nodes, which modify it and feed it to other nodes, which modify it and feed it to still other nodes, and so on. The values stored in the network's output nodes are then correlated with the classification category that the network is trying to learn — such as the objects in an image, or the topic of an essay.

Over the course of the network's training, the operations performed by the individual nodes are continuously modified to yield consistently good results across the whole set of training examples. By the end of the process, the computer scientists who programmed the network often have no idea what the nodes' settings are. Even if they do, it can be very hard to translate that low-level information back into an intelligible description of the system's decision-making process.

As such, the data set provides an excellent test of the CSAIL researchers' system. If the first module has extracted those three phrases, and the second module has correlated them with the correct ratings, then the system has identified the same basis for judgment that the human annotator did. In experiments, the system's agreement with the human annotations was 96 percent and 95 percent, respectively, for ratings of appearance and aroma, and 80 percent for the more nebulous concept of palate.

"There's a lot of hype now — and rightly so — around deep learning, and specifically deep learning for natural-language processing," says Byron Wallace, an assistant professor of computer and information science at Northeastern University. "But a big drawback for these models is that they're often black boxes. Having a model that not only makes very accurate predictions but can also tell you why it's making those predictions is a really important aim."
"As it happens, we have a paper that's similar in spirit being presented at the same conference," Wallace adds. "I didn't know at the time that Regina was working on this, and I actually think hers is better. In our approach, during the training process, while someone is telling us, for example, that a movie review is very positive, we assume that they'll mark a sentence that gives you the rationale. In this way we train the deep-learning model to extract these rationales. But they don't make this assumption, so their model works without using direct annotations with rationales, which is a very nice property."

➢ Automating big-data analysis

(Ms. Dristi Sharma, 4th year CSE)

Last year, MIT researchers presented a system that automated a crucial step in big-data analysis: the selection of a "feature set," or aspects of the data that are useful for making predictions. The researchers entered the system in several data science contests, where it outperformed most of the human competitors and took only hours instead of months to perform its analyses. This week, in a pair of papers at the IEEE International Conference on Data Science and Advanced Analytics, the team described an approach to automating most of the rest of the process of big-data analysis — the preparation of the data for analysis and even the specification of problems that the analysis might be able to solve.
The researchers believe that, again, their systems could perform in days tasks that used to take data scientists months.

The first paper describes a general framework for analyzing time-varying data. It splits the analytic process into three stages: labeling the data, or categorizing salient data points so they can be fed to a machine-learning system; segmenting the data, or determining which time sequences of data points are relevant to which problems; and "featurizing" the data, the step performed by the system the researchers presented last year.
The second paper describes a new language for describing data-analysis problems and a set of algorithms that automatically recombine data in different ways, to determine what types of prediction problems the data might be useful for solving.
According to Kalyan Veeramachaneni, a principal research scientist at MIT's Laboratory for Information and Decision Systems and senior author on all three papers, the work grew out

of his team's experience with real data-analysis problems brought to it by industry researchers.

Developed by Schreck and Veeramachaneni, the new language, dubbed Trane, should reduce the time it takes data scientists to define good prediction problems, from months to days. Kanter, Veeramachaneni, and another Feature Labs employee, Owen Gillespie, have also devised a method that should do the same for the label-segment-featurize (LSF) process.
There, the pertinent data, for predictive purposes, may be not a customer's behavior over some time span, but information about his or her three most recent purchases, whenever they occurred. The framework is flexible enough to accommodate such different specifications. But once those specifications are made, the researchers' algorithm performs the corresponding segmentation and labeling automatically.

"Probably the biggest thing here is that it's a big step toward enabling us to represent prediction problems in a standard way so that you could share that with other analysts in an abstraction from the problem specifics," says Kiri Wagstaff, a senior researcher in artificial intelligence and machine learning at NASA's Jet Propulsion Laboratory. "What I would hope is that this could lead to improved collaboration between whatever domain experts you're working with and the data analysts. Because now the domain experts, if they could learn and would be willing to use this language, could specify their problems in a much more precise way than they're currently able to do."

➢ Designing for 3-D printing

(Ms. Sonam Kumari, 4th year CSE)

3-D printing has progressed over the last decade to include multi-material fabrication, enabling production of powerful, functional objects. While many advances have been made, it still has been difficult for non-programmers to create objects made of many materials (or mixtures of materials) without a more user-friendly interface.

"In traditional manufacturing, objects made of different materials are manufactured via separate processes and then assembled with an adhesive or another binding process," says PhD student Kiril Vidimče, who is first author on the paper. "Even existing multi-material 3-D printers have a similar workflow: parts are designed in traditional CAD [computer-aided-design] systems one at a time and then the print software allows the user to assign a single material to each part." In contrast, Foundry allows users to vary the material properties at a very fine resolution that hasn't been possible before.

"It's like Photoshop for 3-D materials, allowing you to design objects made of new composite materials that have the optimal mechanical, thermal, and conductive properties that you need for a given task," says Vidimče. "You are only constrained by your creativity and your ideas on how to combine materials in novel ways."

Users can preview their design in real-time, rather than having to wait until the final steps in the printing process to see what it will look like. To test Foundry, the team tried the system on non-designers. They were given three different objects to reproduce: a teddy bear, a bone structure, and an integrated "tweel" (tire and wheel). With just an hour's explanation, users could design the bone, tire wheel, and teddy bear in an average of 56, 48, and 26 minutes, respectively. In addition to the user study, the team also fabricated a custom wheel for a toddler tricycle. The wheel had an improved structure to maximize lateral strength, and a foam outer wheel for improved suspension.

Using Foundry to exploit the full capabilities of the 3-D printing platform enables many practical applications in medicine and more. Surgeons could create high-quality replicas of objects like bones to practice on, while doctors could also develop more comfortable dentures and other products that would benefit from having both soft and rigid components. Vidimče's ultimate dream is for Foundry to create a community of designers who can share new operators with each other to expand the possibilities of what can be produced. He also hopes to integrate Foundry into the workflow of existing CAD systems. "The user should be able to iterate on the material composition in a similar manner to how they iterate on the geometry of the part being designed," Vidimče says. "Integrating physics simulations to predict the behavior of the part will allow rapid iteration on the final design."

The research was supported by the National Science Foundation.

➢ Toward visible-light-based imaging for medical devices, autonomous vehicles

(Mr. Siddharth Singh, 3rd year CSE)

MIT researchers have developed a technique for recovering visual information from light that has scattered because of interactions with the environment — such as passing through human tissue. The technique could lead to medical-imaging systems that use visible light, which carries much more information than X-rays or ultrasound waves, or to computer vision systems that work in fog or drizzle. The development of such vision systems has been a major obstacle to self-driving cars. In experiments, the researchers fired a laser beam through a "mask" — a thick sheet of plastic with slits cut through it in a certain configuration, such as the letter A — and then through a 1.5-centimeter "tissue phantom," a slab of material designed to mimic the optical properties of human tissue for purposes of calibrating imaging systems. Light scattered by the tissue phantom was then collected by a high-speed camera, which could measure the light's time of arrival. From that information, the researchers' algorithms were able to reconstruct an accurate image of the pattern cut into the mask.

An imaging algorithm from the MIT Media Lab's Camera Culture group compensates for the scattering of light. The advance could potentially be used to develop optical-wavelength medical imaging and autonomous vehicles. On the basis of that estimate, the algorithm considers each pixel of each successive frame and calculates the probability that it corresponds to any given point in the visual field. Then it goes back to the first frame of video and, using the probabilistic model it has just constructed, predicts what the next frame of video will look like. With each successive frame, it compares its prediction to the actual camera measurement and adjusts its model accordingly. Finally, using the final version of the model, it deduces the pattern of light most likely to have produced the sequence of measurements the camera made.

One limitation of the current version of the system is that the light emitter and the camera are on opposite sides of the scattering medium. That limits its applicability for medical imaging, although Satat believes that it should be possible to use fluorescent particles known as fluorophores, which can be injected into the bloodstream and are already used in medical imaging, as a light source. And fog scatters light much less than human tissue does, so reflected light from laser pulses fired into the environment could be good enough for automotive sensing.

"Looking through scattering media is a problem that's of large consequence," he adds. But he cautions that the new paper does not entirely solve it. "There's maybe one barrier that's been crossed, but there are maybe three more barriers that need to be crossed before this becomes practical," he says.

Ramesh Raskar awarded $500,000 Lemelson-MIT Prize

(Mr. Rajeev Diwary, 2ndyear CSE)

Ramesh Raskar, founder of the Camera Culture research group at the MIT Media Lab and associate professor of media arts and sciences at MIT, is the recipient of the 2016 $500,000 Lemelson-MIT Prize. Raskar is the co-inventor of radical imaging solutions including femtophotography, an ultra-fast imaging system that can see around corners; low-cost eye-care solutions for the developing world; and a camera that allows users to read pages of a book without opening the cover. Raskar seeks to catalyze change on a massive scale by launching platforms that empower inventors to create solutions to improve lives globally.

Raskar has dedicated his career to linking the best of the academic and entrepreneurial worlds with young engineers, igniting a passion for impact inventing. He is a pioneer in the fields of imaging, computer vision and machine learning and his novel imaging platforms offer an understanding of the world that far exceeds human ability. Raskar has mentored more than 100 students, visiting students, interns, and postdocs, who, with his guidance and support, have been able to kick-start their own highly successful careers.
"Raskar is a multi-faceted leader as an inventor, educator, change maker and exemplar connector," said Stephanie Couch, executive director of the Lemelson-MIT Program. "In addition to creating his own remarkable inventions, he is working to connect communities and inventors all over the world to create positive change."

"Everyone has the power to solve problems and through peer-to-peer co-invention and purposeful collaboration, we can solve problems that will impact billions of lives," Raskar says. He plans to use a portion of the Lemelson-MIT Prize money to launch a new effort using peer-to-peer invention platforms that offer new approaches for helping young people in multiple countries to co-invent in a collaborative way. Visit redx.io to learn more or to apply.
Raskar will speak at EmTech MIT, the annual conference on emerging technologies hosted by MIT Technology Review at the MIT Media Lab on Tuesday, Oct. 18.
Seeking nominees for 2017 $500,000 Lemelson-MIT Prize The Lemelson-MIT Program is now seeking nominations for the 2017 $500,000 Lemelson-MIT Prize. Please contact the Lemelson-MIT Program at awards-lemelson@mit.edu for more information or visit the prize website.

The Lemelson-MIT Program celebrates outstanding inventors and inspires young people to pursue creative lives and careers through invention. Jerome H. Lemelson, one of the most prolific inventors in U.S. history, and his wife Dorothy founded the Lemelson-MIT Program at MIT in 1994.

Based in Portland, Oregon, The Lemelson Foundation uses the power of invention to improve lives. Inspired by the belief that invention can solve many of the biggest economic and social challenges of our time, the foundation helps the next generation of inventors and invention-based businesses to flourish. The Lemelson Foundation was established in the early 1990s by prolific inventor Jerome Lemelson and his wife Dorothy. To date, the foundation has made grants totaling more than $200 million in support of its mission.

Fascinating Facts

By: Mr. Siridi Sai Behera
3rd 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 internet users, Facebook would be the third largest country in the World.

Proverbios

- "If at first you don't succeed; call it version 1.0"
- "Programmers are tools for converting caffeine into code."
- "Windows Vista: It's like upgrading from Bill Clinton to George W. Bush."
- "The more I C, the less I see."
- "Unix is user-friendly. It's just very selective about who its friends are."

Comp. Quiz

By: Mr. Rajkumar Garnaik
2nd Year CSE

1. *Which part interprets program instructions and initiate control operations?*

A. Input B. Storage unit
C. Logic unit D. Control unit
E. None of the above

2. *The binary system uses powers of*

A. 2 B. 10
C. 8 D. 16
E. None of the above

3. *Which standard govern parallel communications?*

A. RS232 B. RS-232a
C. CAT 5 D. IEEE 1284
E. None of the above

4. *In laser printer technology, what happens during the conditioning stage?*

A. The corona wire places a uniform positive charge on the paper
B. A uniform negative charge is placed on the photosensitive drum
C. A uniform negative charge is placed on the toner
D. All of the above
E. None of the above

5. *Which of the following is used for modulation and demodulation?*

A. modem B. protocols
C. gateway D. multiplexer
E. None of the above

6. *Which of the following is not a disadvantage of wireless LAN?*

A. Slower data transmission B. higher error rate
C. interference of transmissions from different computers
D. All of the above

7. The Storage-to-Storage instructions

A. have both their operands in the main store.

B. which perform an operation on a register operand and an operand which is located in the main store, generally leaving the result in the register, expect in the case of store operation when it is also written into the specified storage location.

C. which perform indicated operations on two fast registers of the machine and have the result in one of the registers

D. all of the above

8. The LRU algorithm

A. pages out pages that have been used recently

B. pages out pages that have not been used recently

C. pages out pages that have been least used recently

D. pages out the first page in a given area

E. None of the above

9. In SQL, which command is used to make permanent changes made by statements issue since the beginning of a transaction?

A. ZIP

B. PACK

C. COMMIT

D. SAVE

E. None of the above

10. Periodically adding, changing and deleting file records is called file

A. Updating

B. upgrading

C. restructuring

D. renewing

E. None of the above

11. What service is used to translate domain names to IP addresses?

A. NFS

B. SMB

C. NIS

D. DNS

E. None of the above

12. Which of the following command is used to create a Linux installation hoot floppy?

A. mkboot disk

B. bootfp disk

C. ww and rawwrite

D. dd and rawrite

E. None of the above

13. Which of the following languages is more suited to a structured program?

A. PL/1B. FORTRAN

C. BASIC D.PASCAL

E. None of the above

14. *A computer assisted method for the recording and analyzing of existing or hypothetical systems is*

A. Data transmission B. Data flow
C. Data capture D. Data processing
E. None of the above

15. *From what location are the 1st computer instructions available on boot up?*

A. ROM BIOS B.CPU
C. boot.ini D.CONFIG.SYS
E. None of the above

16. *What could cause a fixed disk error?*

A. No-CD installed B. bad ram
C. slow processor D. Incorrect CMOS settings

17. *The part of machine level instruction, which tells the central processor what has to be done, is*

A. Operation code B. Address
C. Locator D. Flip-Flop

18. *Which of the following refers to the associative memory?*

A. the address of the data is generated by the CPU B. address of the data is supplied by the users
C. there is no need for an address i.e. the data is used as an address
E. None of the above

19. *How many digits of the DNIC (Data Network Identification Code) identify the country?*

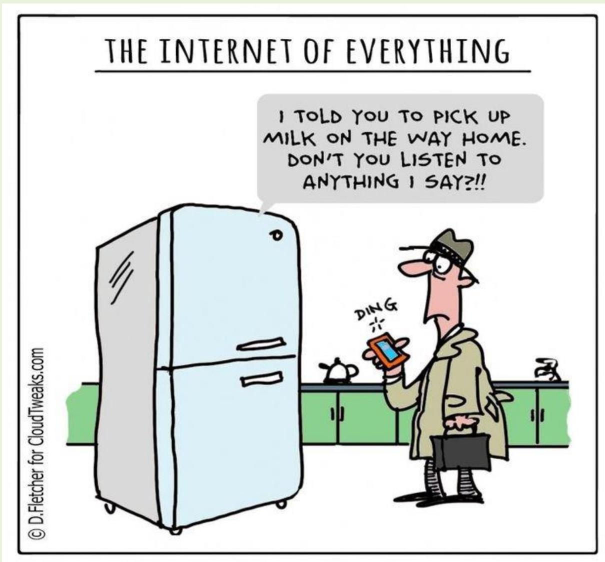
A. First three B. First four
C. First five D. First six
E. None of the above

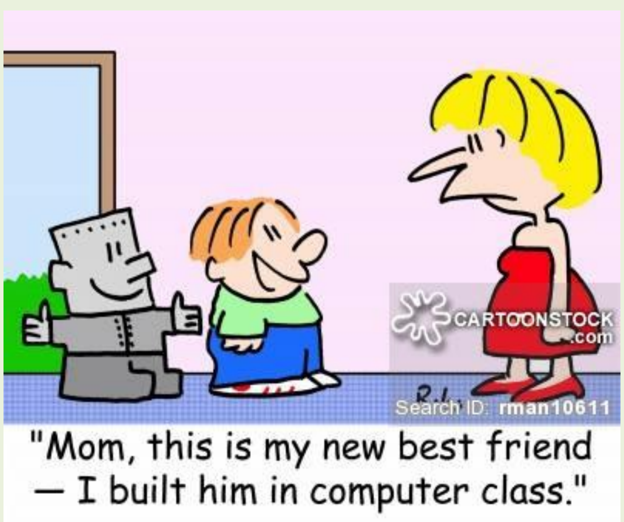
Answers

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

Cartoons

By: Ms. Nidhi Kumari
4th Year CSE





Words of Wisdom

By: Mr. Manoj Kumar Sahoo
3rd Year CSE

Treat your password like your toothbrush. Don't let anybody else use it, and get a new one every six months.

- **Clifford Stoll**

The real danger is not that computers will begin to think like men, but that men will begin to think like computers.

- **Sydney J. Harris**

I think it's fair to say that personal computers have become the most empowering tool we've ever created. They're tools of communication, they're tools of creativity, and they can be shaped by their user.

- **Bill Gates**

Instead of the cashier and ticket-ripper of the movie theater, the block chain consists of thousands of computers that can process digital tickets, money, and many other fiduciary objects in digital form. Think of thousands of robots wearing green eye shades, all checking each other's accounting.

- **Nick Szabo**