Panipat Institute of Engineering & Technology
Approved by AICTE, New Delhi
Affiliated to Kurukshetra University,
Kurukshetra

COMPUTECHIE

Half Yearly Technical Magazine

Aug – Dec 2018

Department of
Computer Science and Engineering

Volume 3 Issue-1

Department Vision

Department of Computer Science and Engineering aspires to become a center of excellence for quality technical education by keeping pace with new technologies to create competent professionals.

Department Mission

M1: To develop professionals with analytical and technical competency for productive career in industry, academia and as entrepreneurs.

M2: To build theoretical and applied skills of faculty and student in computer science and engineering through need based training, research and development on industrially and socially relevant issues.

M3: Continuously improve and provide state-of-the-art laboratories to keep up with the new developments in the area of computer science and engineering.

M4: Create nurturing environment through competitive events, industry interactions, global collaborations and creating concern for lifelong learning.

About Department

PIET-CSE aims to encourage research and innovation in Computer Science and allied area. The objective of the B. Tech program in Computer Science and Engineering (CSE) is to prepare students to undertake careers involving innovation & problem solving using computation techniques and technologies, or to undertake advanced studies for research careers or to take up Entrepreneurship.

While these courses are indeed foundational for many engineering disciplines, they can be treated as application domains. Hence, the B.Tech (CSE) program at PIET starts with computing oriented courses first, and allows the possibility of doing science courses later. Beside being better suited for a CSE program, it also enables the possibility of students seeing newer applications and possibilities of using computing in these subjects.

PROGRAM EDUCATIONAL OUTCOMES (PEOS)

PEO1
- To impart an in-depth knowledge of science, mathematics, and computer science and engineering to create a foundation for building capacity and competence in using the fundamental and core knowledge.

PEO2
- To facilitate and foster technical and analytical skills in students to develop innovative solutions to complex real life problems using existing and novel technologies.

PEO3
- To train students with the relevant soft skills and also with a concern for lifelong learning.

PEO4
- To expose them to various contemporary and social issues which will enable them become ethical and responsible citizens of the society.

MESSAGE

DIRECTOR's MESSAGE

Professor (Dr) Shakti Kumar
(Director)

Educating the youth for this kind of initiative, to be good citizen of there nobel countries is an excellent form of contributing towards the peace and well being of our CSE Department.

I Sincerely, Appreciate, acknowledge and honour the entire department who are the part of this magazine.

With my sincere wishes ,It is a reverent prayer that all students and the respective faculty may be blessed and more enthusiastic in performing and initiating such activities at departmental level.

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MESSAGE

DIRECTOR's MESSAGE

Dr. S. C. Gupta
Professor and HOD, Department of
Computer Science and Engineering

I am proud to assert that our department has met this standard of success with utmost humility. I gratefully Recall the contributions of our teachers and all those who followed in line down initiating of magazine .May the gleam of our department ever illumine the years Ahead..

EDITORIAL
TEAM

Dr. Anju Gandhi
Professor, CSE

Ms. Shally Chawla
Assistant Professor, CSE

Pratham Kataria
B. Tech, 3rd Year

Harshit Duhan
B. Tech, 3rd Year

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FACULTY ARTICLE

Query Optimization

Query optimization is the overall process of choosing the most efficient means of executing a SQL statement. SQL is a nonprocedural language, so the optimizer is free to merge, reorganize, and process in any order..The database optimizes each SQL statement based on statistics collected about the accessed data. The optimizer determines the optimal plan for a SQL statement by examining multiple access methods, such as full table scan or index scans, different join methods such as nested loops and hash joins, different join orders, and possible transformations. For a given query and environment. the optimizer assigns a relative numerical cost to each step of a possible plan, and then factors these values together to generate an overall cost estimate for the plan.

The optimizer choose the plan with the lowest cost among all considered candidate plans. The optimizer uses available statistics to calculate cost. For a specific query in a given environment, the cost computation accounts for factors of query execution such as I/O, CPU, and communication. For example, a query might request information about employees who are managers. If the optimizer statistics indicate that 80% of employees are managers, then the optimizer may decide that a full table scan is most efficient. However, if statistics indicate that very few employees are managers, then reading an index followed by a table access by row id may be more efficient than a full table scan.

Deepak Wadhwa
(Assistant professor

FACULTY ARTICLE

Big Data Analytics

The volume of data that one has to deal has exploded to unimaginable levels in the past decade, and at the same time, the price of data storage has systematically reduced. Private companies and research institutions capture terabytes of data about their users' interactions, business, social media, and also sensors from devices such as mobile phones and automobiles. The challenge of this era is to make sense of this sea of data. This is where big data analytics comes into picture. The process of converting large amounts of unstructured raw data, retrieved from different sources to a data product useful for organizations forms the core of Big Data Analytics. One of the most important tasks in big data analytics is statistical modeling, meaning supervised and unsupervised classification or regression problems. Once the data is cleaned and preprocessed, available for modeling, care should be taken in evaluating different models with reasonable loss metrics and then once the model is implemented, further evaluation and results should be reported. Data products that result from developing a big data product are in most of the cases some of the following: **Machine learning implementation**, **Recommender system**, **Netflix**, **Dashboard**, **Ad-Hoc analysis** Big data analyst is an **individual that reviews, analyzes and reports on big data stored and maintained by an organization**. Big data analysts have a similar job description and skill set as that of data analysts, but they specialize in the analysis of big data or big data analytics.

-Dr. Suman Arora
Associate Professor (CSE)

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Deepak Wadhwa
(Assistant professor

FACULTY ARTICLE

Rubik's Cube solved by deep learning algorithm in fraction of a second
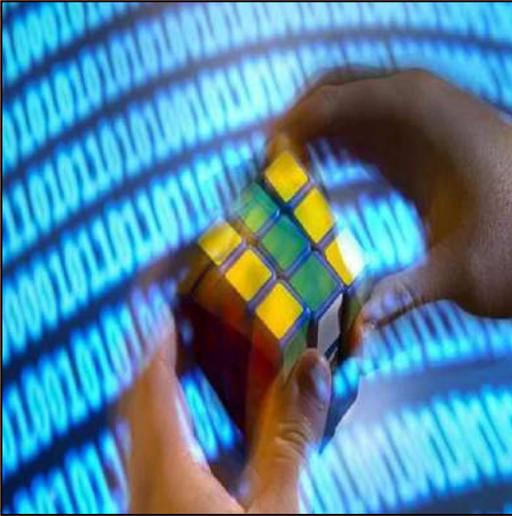
Deep CubeA, a deep reinforcement learning algorithm programmed by UCI computer scientists and mathematicians, can find the solution in a fraction of a second, without any specific domain knowledge or in-game coaching from humans. This is no simple task considering that the cube has completion paths numbering in the billions but only one goal state -- each of six sides displaying a solid color -- which apparently can't be found through random moves.

For a study published today in *Nature Machine Intelligence*, the researchers demonstrated that DeepCubeA solved 100 percent of all test configurations, finding the shortest path to the goal state about 60 percent of the time. The algorithm also works on other combinatorial games such as the sliding tile puzzle, Lights Out and Sokoban.

Shivani Gaba
(Assistant professor)

CRYPTOJACKING

Two words—"cryptography" and "currency"—combine to form "cryptocurrency," which is electronic money, based on the principles of complex mathematical encryption. All crypto currencies exist as encrypted decentralized monetary units, freely transferable between network participants. Or put more simply, cryptocurrency is electricity converted into lines of code , which have a real monetary value.

Cryptojacking is the unauthorized use of computing resources to mine cryptocurrencies. The idea is that a smart system can utilize the resources of visiting devices or end users to contribute to bitcoin mining or other similar mining efforts. The use of cryptojacking is spurring enormous controversy over the appropriate use of shared resources and interactions between digital parties.

Cryptojackers have more than one way to enslave your computer. One method works like classic malware. You click on a malicious link in an email and it loads cryptomining code directly onto your computer. Once your computer is infected, the cryptojacker starts working around the clock to mine cryptocurrency while staying hidden in the background. Because it resides on your PC, it's local—a persistent threat that has infected the computer itself.

-Rishabh

Block chain Technology

Block chain (BC), the technology behind the Bit coin crypto-currency system, is considered to be both alluring and critical for ensuring enhance d security and (in some implementations, non-traceable) privacy for diverse applications in many other domains - including in the Internet of Things (IoT) eco-system. Intensive research is currently being conducted in both academia and industry applying the Block chain technology in multifarious applications. Proof-of-Work (PoW), a cryptographic puzzle, plays a vital role in ensuring BC security by maintaining a digital led ger of transactions, which is considered to be incorruptible.

Furthermore, BC uses a changeable Public Key (PK) to record the users' identity, which provides an extra layer of privacy. Not only in crypto currency has the successful adoption of BC bee n implemented but also in multifaceted non-mon etary systems such as in: distributed storage sys tems, proof-of-location, healthcare, decentralized voting and so forth.

-Aayush

Water Droplet Computer

As anyone who has experienced the devastation of spilling a glass of water on their laptop knows, H_2O and computers don't mix. Almost equally as bad? Magnets. Both are terrible, horrible, no-good computer killing substances... which is why it was kind of a surprise to learn about a brand new computer built using water droplets and an electromagnet.

A 'computer' is a machine that can follow a program or list of instructions. This computer, announced in a paper published this week in **Nature Physics, doesn't process information, however, like electronic computers do today. Instead, it can manipulate tiny droplets of water.**

A bioengineer at Stanford who designed the computer along with his students said "Droplets are fascinating material, because they are a little bag, you can put anything you want in it.

In this case, his team put tiny amounts of magnetic nano particles into the water droplets, and placed them on a tiny metal maze about the size of a stamp. The metal bar act as pathways along which the magnetic drops can travel--a movement that is equivalent to the patterns of ones and zeros that make up computer code today.

The hope is that one day, those tiny droplets could act like test tubes, analysing chemicals or biological components more quickly and more easily than any current lab technology.

There are plans to release the design of this physical computer to the public.

-Aksh Rawal

ARTICLE

LiFi

- LiFi is a wireless optical networking technology that uses light - emitting diodes (LEDs) for data transmission. LiFi is designed to use LED light bulbs similar to those currently in use in many energy-conscious homes and offices.

→ Physical range : visible light spectrum, ultraviolet and infrared radiation.

→ Introduced : March 2011 (8 years ago)

→ Industry : Digital Communication

→ Connector type : visible light communication

Webinar on Artificial Intelligence

Webinar provided an introduction to the technology, applications and issues in providing electrical power for mobile devices such as wearables / medical devices and remotely installed equipment for the Internet of Things. Users will be able to understand how power can be provided for the billions of devices that will be remotely connected to the Internet in the years ahead.

EVENTS

Live Hacking Session

"LIVE HACKING SESSION" for 1st and 2nd year was conducted on 17th Oct 2017 by the CSE Department. The course includes two sessions, Ethical Hacking and Machine Learning. Cybercrime is a serious global threat. By becoming an ethical hacker, you can help organizations protect themselves from cyber criminals through penetration testing, key logger coding, and IT system security management.
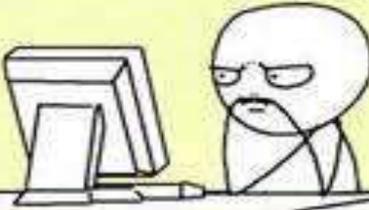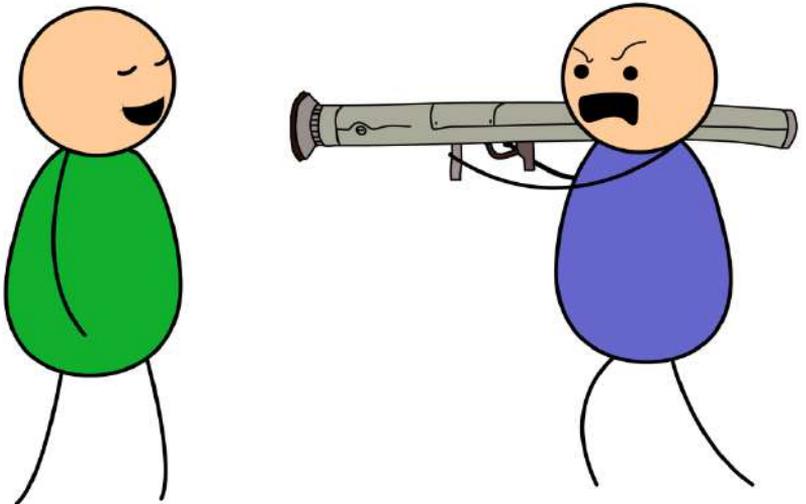
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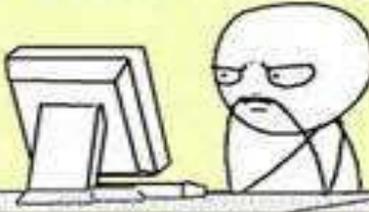
CROSS-WORD

Technology Crossword Puzzle
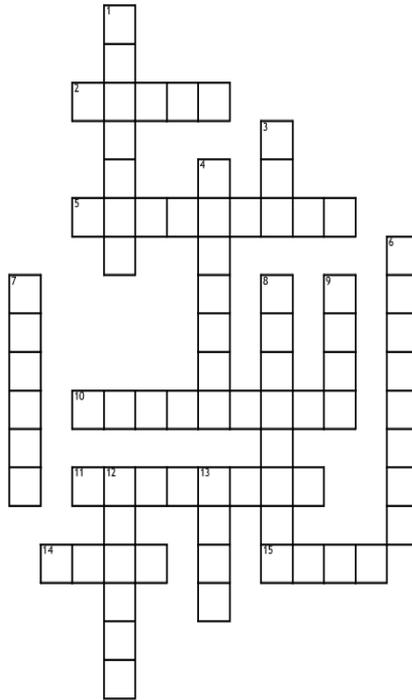
Across

2. A device that feeds data into a computer, such as a keyboard or mouse.

5. The exclusive right, as recognized separately in each country, to publish and sell literary, artistic, or musical materials.

10. A software system that links topics on the screen to related information and graphics, which are typically accessed by a point-and-click method.

11. copy (data) from one computer system to another, typically over the Internet.

14. Usually consists of eight bits.

15. A measure of the amount of computational work that a computer system performs.

Down

1. Usually comprises the display device, circuitry, casing, and power supply.

3. An error, flaw, failure, or fault in a computer program or system that causes it to produce an incorrect or unexpected result or to behave in unintended ways.

4. A client software program that runs against a Web server or other Internet server and enables a user to navigate the World Wide Web (WWW) to access and display data.

6. The collection of physical parts of a computer system.

7. Sending an email, posting photos on a social media site and using your webcam.

8. A part of a computer system or network that is designed to block unauthorized access while permitting outward communication.

9. The combination of typeface and other qualities, such as size, pitch, and spacing.

12. Any computer-generated information displayed on screen, printed on paper or in machine readable form, such as disk and tape.

13. A word or group of words that act as a way to cross reference to other documents or files on the computer.