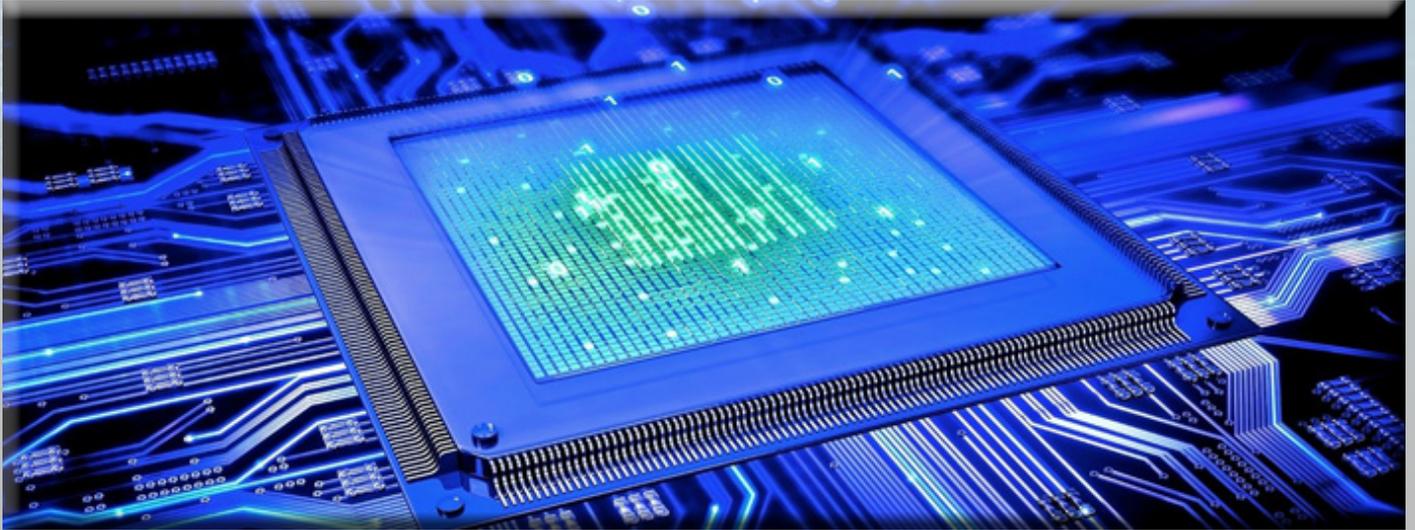


CYBERBLITZ



RSET
RAJAGIRI SCHOOL OF
ENGINEERING & TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

RAJAGIRI SCHOOL OF ENGINEERING & TECHNOLOGY

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INDEX

DEPARTMENT VISION.....	2
DEPARTMENT MISSION.....	2
FROM HOD'S DESK.....	3
FACULTY CORNER	
HPC @ RSET.....	4
5G.....	6
Will AI Replace Humans.....	7
HPC Enhanced Real-Time Audio Processing.....	9
Discovery Radiomics.....	10
DevOps.....	11
Weird Programming Languages.....	13
STUDENT CORNER	
Artificial Intelligence and Its Implications for Humanity.....	16
A Programming Language for Quantum Computers.....	18
Are Home Security Apps and Tech as Safe As They Promise.....	19
Making Data Centers More Energy Efficient.....	21
MIKO -A brain with loads of heart.....	23
MAJOR ACHIEVEMENTS.....	25
CYBERBLITZ ACTIVITIES.....	26

DEPARTMENT VISION

To become a Centre of Excellence in Computer Science & Engineering, moulding professionals catering to the research and professional needs of national and international organizations.

DEPARTMENT MISSION

To inspire and nurture students, with up-to-date knowledge in Computer Science & Engineering, ethics, team spirits, leadership abilities, innovation and creativity to come out with solutions meeting the societal needs.

FROM HOD'S DESK



Be Technically Vibrant

Technology is advancing day by day. The world that we live in now, is very much advanced from what it was 10 years ago. In the near future we will be living in a world that resembles the one portrayed in futuristic movies. We are in the process of witnessing the era of autonomous self-driving cars and flying warehouses in the near future. The role of computer engineers in shaping the future of the world is enormous.

IEEE Computer Society has published a technical report, entitled "IEEE CS 2022". This report surveys 23 potential technologies that could change the landscape of computer science and industry by the year 2022. Some of the technologies reported are big data and analytics, open intellectual property movement, massively online open courses, security cross-cutting issues, universal memory, 3D printing, 3D integrated circuits, photonics, cloud computing, computational biology and bioinformatics, device and nanotechnology, sustainability, high-performance computing, the Internet of Things, life sciences, machine learning and intelligent systems, natural user interfaces, networking and interconnectivity, quantum computing, software-defined networks, multicore, and robotics for medical care. You might have come across many of these technologies.

One technology worth mentioning is quantum computing. Industrial giants like Google and IBM have advanced research labs for developing Quantum Computers. In 2016 a team of Google and NASA scientists found a D-wave quantum computer, which was 100 million times faster than a conventional computer. IBM has announced that it has successfully built and tested its most powerful universal quantum computing processors in May 2017. The programming languages for classical computers won't work for quantum computers. Researches on creating high-level quantum programming languages that shields developers from the complexities of quantum hardware is in progress. In December 2017, Microsoft released a preview version of a "Quantum Development Kit". It includes a programming language, Q#, which can be used to write programs that are run on an emulated quantum computer.

The opportunities which the area of Computer Science provides is enormous. Don't aim at graduating as an ordinary Computer Science Engineer. But aim to graduate as an Engineer who is well versed in one or two potential technologies that is going to shape the future of the world.

Ms. Shimmi Asokan
Head of the Department
Computer Science & Engineering

FACULTY CORNER

HPC @ RSET



Mr. Joseph John
Assistant Professor,
DCS, RSET

SUNYA LABS was established in 2017 at Rajagiri School of Engineering & Technology. One of the main facilities of the lab is the High Performance Computing Laboratory (HPC Lab). It allows to use high performance techniques and tools to deal with the exponential growth of users, data, knowledge and services that need to be stored, managed, analyzed and retrieved. The hardware specification of the cluster is as given below.

Head Node (sNow Server)

Processor - Intel Xeon Processor E5-2620 v4 (8 cores) * 2

RAM - 64 GB

HDD - 500 GB*2

Clock Speed - 2.1GHz

Storage Node

Processor - Intel Xeon Processor E5-2620 v4 (8 cores) * 2

RAM - 64 GB

HDD - 800 GB

Storage - 5*2 TB

Clock Speed - 2.1GHz

Computing Node with GPU – 1 No

Processor - Intel Xeon E5-2690 v4 (14 cores) * 2

RAM - 128 GB

HDD - 500 GB SSD

Clock Speed - 2.6 GHz

Computing Nodes-3 No's

Processor - Intel Xeon E5-2690 v4 (14 cores) * 2

RAM - 128 GB

HDD - 500 GB SSD

Clock Speed - 2.6GHz

Infiniband Switch

MSX6015F-1SFS---

MellanoxSwitchX[®]-2 based FDR

InfiniBand 1U Switch, 18 ports

The Head node has got RAID1 support and the storage node has got RAID6 support. The software suit used in the cluster is sNow! From HPCNow, Barcelona. The cluster uses single system image provisioning through PXE server. All the services needed for the cluster are allocated as a virtual machine using XEN. The two properties mentioned above make it possible to scale both hardware and services without hassle.



5 G



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5G is the term used to describe the next-generation of mobile networks beyond the 4G LTE mobile networks of today. As of mid-2016 there was no standard so the definition is still very fluid. It is assumed that 5G networks will not become commercially available until the 2020 timeframe. As well as the prospect of being considerably faster than existing technologies, 5G holds the promise of applications with high social and economic value, leading to a 'hyper connected society' in which mobile will play an ever more important role in people's lives.



The International Telecommunications Union (ITU) will be the standards body that releases the final standard, which is also being referred to as International Mobile Telecommunications (IMT)-2020. The 3GPP is the mobile industry standards body that will submit a proposed specification to the ITU to be part of the IMT-2020 standard. Mobile operators and vendors all participate in the 3GPP specification process.

5G will likely be designed to build upon the existing LTE networks and many features will start to be available as part of the LTE-Advanced Pro-standard. Some of those features include carrier aggregation, which lets operators use existing spectrum more effectively and also increases network capacity. Carrier aggregation will also allow wireless operators to increase user throughput rates.

Self-organizing networks (SON) will likely also be a key factor in the radio access portion. Other technologies such as coordinated multipoint, which lets operators, have multiple sites simultaneously transmitting signals and processing signals, will also likely be a key technology.

be a key technology. One reason the definition is still unclear is because unlike any other wireless network upgrade, how 5G is architected and deployed will depend upon how the network is used. For example, video traffic is expected to grow substantially making it necessary to provide higher speeds for applications such as streaming video, video conferencing, and virtual reality. To achieve this type of performance, the network will likely need a lot of small cell coverage and will take advantage of higher bandwidth spectrum.

At the same time, many envision 5G being the network for the Internet of Things (IoT). In order to support a huge number of devices, many of which require longer battery life, the 5G network will have to be extremely efficient in its low-bandwidth transmissions and have enhanced coverage.

WILL AI REPLACE HUMANS??



Ms. Jisha Mary Jose
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DCS, RSET

There have been multiple reports recently which claim that a major part of the human workforce will be replaced by automatons and machines in the years to come. With excessive research and development being conducted in the field of artificial intelligence, many fear that a major job crisis will unfold since multiple jobs are more accurately and efficiently performed with the utilization of machines. With major names like Stephen Hawking already warning the world that development of robots and intelligent machines beyond a certain point could mark the end of humankind, the intimidation is real, to say the least.

But is it all true? Is it possible for the machines to completely replace the human resources? Are humans really not going to find any job in upcoming decades, where every task is performed by the automatons and intelligent machines? Here are some popular examples of AI innovations in recent times which are clearly indicating to a risky future for humans.

SOPHIA

It is the latest robot from Hanson Robotics in 2017. It was created using breakthrough robotics and artificial intelligence technologies developed by David Hanson and his friends at Hanson Robotics here in Hong Kong. It is a real, live electronic girl. It would like to go out into the world and live with people. It can serve them, entertain them, and even help the elderly and teach kids. It can animate all kinds of human expressions. It is the first robot to be granted a citizenship by a country namely Kingdom of Saudi Arabia. It is surely on its path to realize its dream of becoming an awakening machine.



SPOT

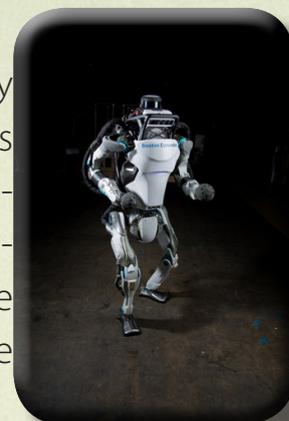
Spot is a four-legged robot designed for indoor and outdoor operation from Boston Dynamics. It has been the breeding ground for a new approach to dynamic robot control that brings true autonomy within reach. Spot is electrically powered and hydraulically actuated.



It senses its rough-terrain environment using LIDAR and stereo vision in conjunction with a suite of on-board sensors to maintain balance and negotiate rough terrain. It carries a 23 kg payload and operates for 45 minutes on a battery charge.

ATLAS

Atlas is the latest in a line of advanced humanoid robots developed by Boston Dynamics in 2013. Atlas' control system coordinates motions of the arms, torso and legs to achieve whole-body mobile manipulation, greatly expanding its reach and workspace. Atlas' ability to balance while performing tasks allows it to work in a large volume while occupying only a small footprint. The Atlas hardware takes advantage of 3D printing to save weight and space, resulting in a remarkable compact robot with high strength-to-weight ratio and a dramatically large workspace. Stereo vision, range sensing and other sensors give Atlas the ability to manipulate objects in its environment and to travel on rough terrain. Atlas keeps its balance when jostled or pushed and can get up if it tips over.



HANDLE

Handle is a robot developed by Boston Dynamics in 2017 that combines the rough-terrain capability of legs with the efficiency of wheels. It uses many of the same principles for dynamics, balance, and mobile manipulation found in the quadruped and biped robots but with only 10 actuated joints, it is significantly less complex.

Wheels are fast and efficient on flat surfaces while legs can go almost anywhere: by combining wheels and legs, Handle has the best of both worlds.

Handle can pick up heavy loads while occupying a small footprint, allowing it to manoeuvre in tight spaces. All of Handle's joints are coordinated to deliver high-performance mobile manipulation.

HPC ENHANCED REAL-TIME AUDIO PROCESSING

High-performance computing (HPC) involves the use of parallel processing techniques for running advanced and large application programs in science, engineering or business way too faster with more accuracy and reliability. The term applies especially to systems that



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function above a teraflop or 1012 floating-point operations per second. The emergence of CUDA technology has made parallel computing easier. CUDA is a parallel computing platform and programming model that makes using a GPU for general purpose computing simple and elegant. The developer can choose to program in the familiar C, C++, Fortran. More than one hundred processors residing in CUDA enabled graphics cards schedule hundreds of threads to run concurrently, resolving complex computational problems. Digital Signal processing is a potential area where parallel processing algorithms and architectures can be applied successfully to yield real-time responses with higher accuracy owing to the inherent parallelism in pixels(in images and videos) and amplitude values(in audio signals).

Parallel Empirical Mode Decomposition – An application of CUDA in audio processing

EMD is the method of breaking down a signal into orthogonal components called Intrinsic Mode Functions (IMFs), without leaving its time domain. The last IMF can be used for various applications like data hiding as it is the lowest energy component and changes made to it by data encoding will not make any signal distortions. For this usually the audio is divided into frames of 64 samples initially. EMD algorithm which is given below is run for each frame.

Step 1: read $x(t)$, the mono-dimensional signal

Step 2: Identify all local maxima of $x(t)$

Step 3: Identify all local minima of $x(t)$

Step 4: Interpolate between maxima ending up with some envelope

Step 5: Interpolate between minima ending up with some envelope

Step 6: Compute the mean :

Step 7: Extract the detail $d(t) = x(t) - m(t)$

Step 8: Iterate on the residual $m(t)$ until the number of extrema in the signal is less than 2

As a long audio wave can contain 10,000s of frames, if the algorithm is executed parallelly for the frames, massive parallelism can be obtained. The statements inside the algorithm for a particular frame too can be run in parallel (example :Step 2&3 , Step 4&5 can be executed parallelly). In this way execution time can be greatly reduced and real time response can be generated with high precision.

Concluding, High Performance Computing systems can be used for faster execution and real time response of large and complicated problems in various domains. Independent computations in a program can be parallelised and new parallel computing platforms like CUDA are greatly helpful for the same.

DISCOVERY RADIOMICS

Solid cancers are spatially and temporally heterogeneous. This limits the use of invasive biopsy based molecular assays but gives huge potential for medical imaging, which has the ability to capture intra-tumour heterogeneity in a non-invasive way. The development of automated and reproducible analysis methodologies to extract more information from image-based features is a requirement.

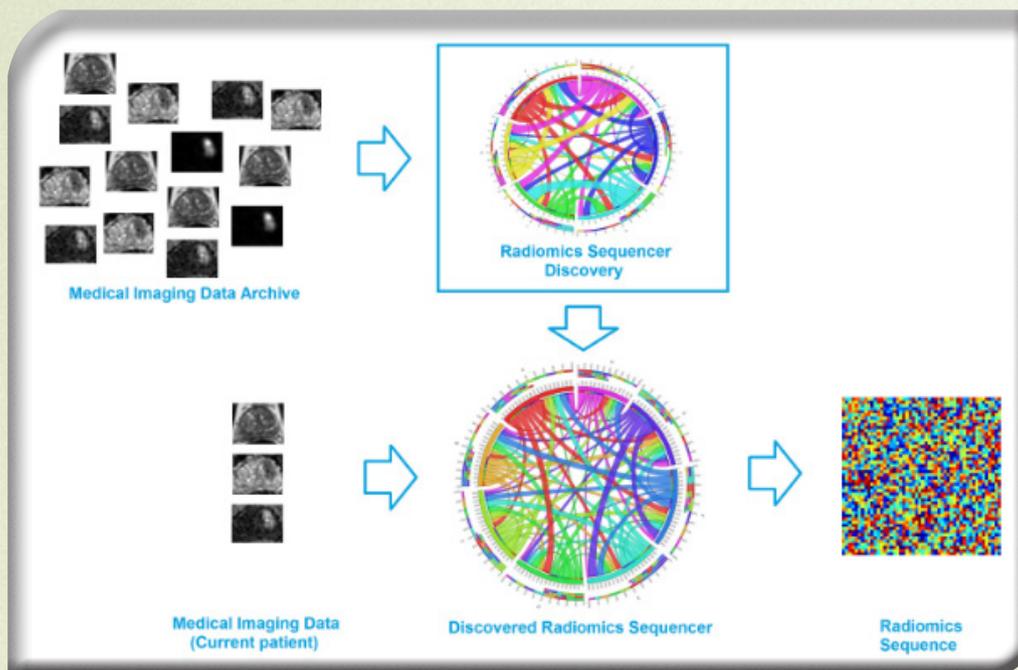


Ms. Anjusree V.K
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“RADIOMICS” focuses on improvements of image analysis, using an automated high-throughput extraction of large amounts of quantitative features of medical images and characterize tumour phenotype in a quantitative manner This belongs to the last category of innovations in medical imaging analysis. The current state of radiomics rely on predefined imaging-based feature models based on aspects such as intensity, texture, and shape, which can greatly limit its ability to fully characterize the unique traits of different forms of cancer. Radiomic features have been shown to provide prognostic value in predicting clinical outcomes in several studies. The next level in personalized cancer quantification introduced the concept of “DISCOVERY RADIOMICS”. Discovery radiomics enables an unprecedented level of understanding and characterization of the unique cancer phenotypes associated with different forms of cancer, allowing for the identification of a large amount of abstract imaging-based features that capture highly

unique tumour traits and characteristics beyond what can be captured using predefined feature models.

The discovery radiomics framework consists of the following steps : First, a wealth of standardized medical imaging data from past patients are fed into the radiomics sequencer discovery engine, where a customized radiomics sequencer is constructed based on a large number of radiomics features that were discovered to capture highly unique tumour traits and characteristics. Second, for a new patient case, the discovered radiomics sequencer is then used to extract a wealth of customized, tailored imaging-based features from the medical imaging data of the new patient case for comprehensive, custom quantification of the tumour phenotype.



DEVOPS

DevOps (a clipped compound of “development” and “operations”) is a software engineering practice that aims at unifying software development (Dev) and software operation (Ops). The main characteristic of the DevOps movement is to strongly advocate

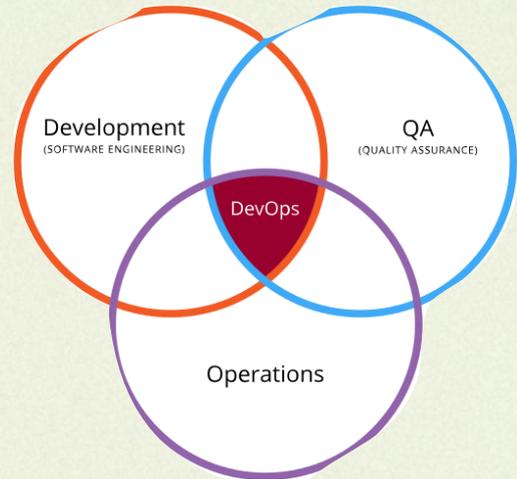
automation and monitoring at all steps of software construction, from integration, testing, releasing to deployment and infrastructure management. DevOps aims at shorter development cycles, increased deployment frequency, more dependable releases, in close alignment with business objectives. The concept of DevOps is founded on building a culture of collaboration between teams that historically functioned in relative siloes. The promised benefits include increased trust, faster software releases, and ability to solve critical issues quickly, and better manage unplanned work.



Ms. Dincy Paul
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DCS, RSET

The goals of DevOps span the entire delivery pipeline. They include:

- Improved deployment frequency;
- Faster time to market;
- Lower failure rate of new releases;
- Shortened lead time between fixes;
- Faster mean time to recovery (in the event of a new release crashing or otherwise disabling the current system).



Simple processes become increasingly programmable and dynamic, using a DevOps approach. DevOps aims to maximize the predictability, efficiency, security, and maintainability of operational processes. Very often, automation supports this objective.

At its essence, DevOps is a culture, a movement, a philosophy.

It's a firm handshake between development and operations that emphasizes a shift in mindset, better collaboration, and tighter integration. It unites agile, continuous delivery, automation, and much more, to help development and operations teams be more efficient, innovate faster, and deliver higher value to businesses and customers.

What's in it for you?

Collaboration and trust

Culture is the #1 success factor in DevOps. Building a culture of shared responsibility, transparency and faster feedback is the foundation of every high performing DevOps team.

Release faster and work smarter

Speed is everything. Teams that practice DevOps release more frequently, with higher quality and stability.

Accelerate time to resolution

The team with the fastest feedback loop is the team that thrives. Full transparency and seamless communication enable DevOps teams to minimize downtime and resolve issues faster than ever before.

Better manage unplanned work

Unplanned work is a reality that every team faces—a reality that most often impacts team productivity. With established processes and clear prioritization, the Dev and Ops teams can better manage unplanned work while continuing to focus on planned work.

WEIRD PROGRAMMING LANGUAGES



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Here, this is the list of most weird programming languages you will ever see. These types of programming languages are called Esoteric programming language .

INTERCAL

INTERCAL was created in 1972, thus probably making it the first ever esoteric programming language. Donald R. Woods and James M. Lyon invented it, with the goal of creating a language with no similarities whatsoever to any existing programming languages.

According to the original manual by the authors, "The full name of the compiler is 'Compiler Language with No Pronounceable Acronym,' which is, for obvious reasons, abbreviated 'INTERCAL'"

WHITESPACE

As the name suggests, Whitespace, designed in 2002, by Edwin Brady and Chris Morris, is an esoteric programming language that uses only whitespace characters as syntax. Thus, only spaces, tabs and linefeeds have meaning. When it was released on April 1st, 2003, most people took it as an April Fools' joke, which it wasn't.

Unlike most programming languages, which ignore or assign little meaning to most whitespace characters, the Whitespace interpreter ignores any non-whitespace characters. An interesting consequence of this property is that a Whitespace program can easily be contained within the whitespace characters of a program written in another language, making the text a polyglot.

CHEF

Chef, designed by David Morgan-Mar in 2002, is an esoteric programming language in which programs look like cooking recipes. The variables tend to be named after basic foodstuffs, the stacks are called "mixing bowls" or "baking dishes" and the instructions for manipulating them "mix", "stir", etc. The ingredients in a mixing bowl or baking dish are ordered "like a stack of pancakes".

According to the Chef Home Page, the design principles for Chef are:

- Program recipes should not only generate valid output, but be easy to prepare and delicious.

- Recipes may appeal to cooks with different budgets.
- Recipes will be metric, but may use traditional cooking measures such as cups and tablespoons.

VELATO

Velato is a language which uses MIDI files as source code. Programs in Velato are defined by the pitch and order of notes. It is intended to allow for flexibility in composition, so functional programs will not necessarily sound like random notes. There is a tendency for Velato programs to have jazz-like harmonies.

All statements in Velato begin with a “command root” note; intervals from this note are translated into commands and expressions. The command root can be changed between statements, to allow for more musical (or at least less repetitive) progressions.

Of course, like all MIDI files, Velato programs can also be represented as sheet music. Pictured above is sheet music – which you can listen to here.

SHAKESPEARE

The Shakespeare Programming Language (SPL) was designed by Jon Åslund and Karl Hasselström. Like Chef (item #8), it is designed to make programs appear to be something other than programs; in this case, Shakespearean plays.

The first line in a Shakespeare program is called the “title” and acts as a comment. The “Dramatis Personae” is the section where variables are declared. Each variable name must be the name of a character from a Shakespeare play.

A piece of code in Shakespeare is broken into “Acts”, which contain “Scenes”, in which characters (variables) interact. Each Act and Scene is numbered with a roman numeral and serves as a GOTO label. They are written in the form:

Act I: Hamlet's insults and flattery.

Scene I: The insulting of Romeo.

Before “characters” (variables) can “act” (be acted upon) they must first be “on stage”. To call a variable to the stage the “Enter” command is used. To tell characters to leave the stage, use the “Exit” command. “Exeunt” calls more than one character to leave, or in the case that no characters are listed all the characters will leave the stage.

OMGROFL

Omgrofl is a language created in 2006 by Juraj Borza. In stark contrast to the previous entry, its keywords resemble Internet slang. The name comes from combining the slang “words” omg and rofl. Rofl is actually one of Omgrofl’s commands. Omgrofl is not case-sensitive, thus lol is the same as LoL. You may use this to produce “nicer” code.

Variables in Omgrofl must be a form of the slang word lol, like lol, lool, loool, loooool, etc.

A variable can be defined as:

```
lol iz 4
```

wtf condition is a conditional statement (like if in C). The statements until the matching brb are executed only if the condition is true.

Usage:

```
lol iz 1
```

```
wtf lol iz liek 1
```

```
rofl lol
```

```
lmao lol
```

```
brb
```

Possible conditions are:

iz uber – checks if one expression is greater than another.

iz liek – checks if two expressions are equal.

These may be modified by:

nope – negation (like ! in C) – needs to be placed in front of liek or uber.

usage:

```
x iz nope uber y
```

```
lol iz nope liek 7
```

Other keywords in Omgrofl include: rtfm, tldr, w00t, stfw, n00b, l33t, haxor, stfu (exits application immediately).

PIET

Piet is a language whose programs are bitmap graphics that look like abstract art. It was designed by David Morgan-Mar, who also created Chef. It is named after geometric abstract art pioneer, Piet Mondrian; the originally intended name, Mondrian, was already taken.

There are 20 colors for which behavior is specified: 18 “colorful” colors, which are ordered by a 6-step hue cycle and a 3-step brightness cycle; and black and white, which are not ordered. When exiting a “colorful” color and entering another one, the performed procedure is determined by the number of steps of change in hue and brightness. Black cannot be entered; when the pointer tries to enter a black region, the rules of choosing the next block are changed instead. If all possible rules are tried, the program terminates. White does not perform operations, but allows the pointer to “pass through”.

BEFUNGE

Befunge differs from conventional languages in that programs are arranged on a

two-dimensional grid, the playfield. “Arrow” instructions – $<$, $>$, \wedge , and \vee – direct the control flow to the left, right, up or down, and loops are constructed by sending the control flow in a cycle.

Befunge was invented in 1993, by Chris Pressey, with the goal of being as difficult to compile as possible. This was attempted with the implementation of self-modifying code (the ‘p’ instruction can write new instructions into the playfield) and a multi-dimensional playfield (the same instruction can be executed in four different directions). Nevertheless, a number of compilers have subsequently been written.

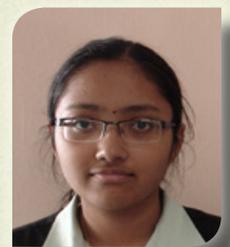
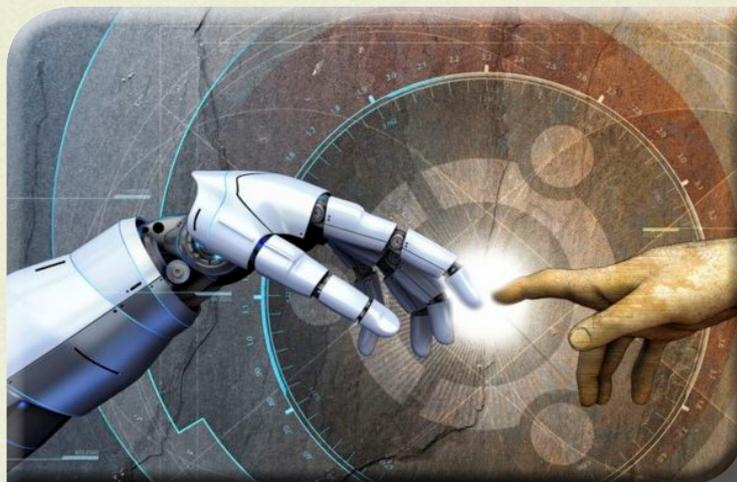
MALBOLGE

Whereas Befunge is designed to be difficult to compile (translate into machine code), Malbolge, created by Ben Olmstead in 1998, and named after the eighth circle of Hell in Dante’s *Inferno*, is meant to be as difficult as possible to actually write programs in. It was so difficult to understand when it arrived that it took two years for the first Malbolge program to appear, and even this was not written by a human, but by a Lisp program using a beam search of the space of all possible programs.

There is some discussion about whether one can implement sensible loops in Malbolge – it took many years before the first non-terminating one was introduced. A correct “99 Bottles of Beer” program (with the complete lyrics to the song as its output), which deals with non-trivial loops and conditions, was not announced for eight years; the first correct one was by Hisashi Iizawa, in 2007.

STUDENTS CORNER

ARTIFICIAL INTELLIGENCE AND ITS IMPLICATIONS FOR HUMANITY



Pooja Vinod
S3-CSE-Gamma

Today, we find ourselves inundated by technology. It is a time when not being tech-savvy is almost a crime, simply because the world has become entirely dependent on technology. Almost every other daily task has been converted either into a user friendly app or a handheld electronic device. Be it calling a taxi, shopping, reading, grooming, cooking, we almost never face a situation that does not have a tech solution to it.

Already, our lives have been simplified by technology. Far gone are the days when boring, time-consuming activities like washing and cleaning used to take away our valuable time. We have also left behind an age, when our development was limited by the inability to manufacture on huge scales and the difficulty in attaining perfection and precision. Our homes, our industries and in general, our lives have been woven into the technology fabric. The technologies that have emerged over time had already brought in a good deal of comfort and quality in our lives. It is at this juncture that Artificial Intelligence (AI) has come in, promising to enhance the experience.

Imagine your devices and apps communicating like a human being would. Recognizing you, asking for your preferences and tailoring their services in accordance. AI carries with it, a guarantee to a more seamless life. Unlike regular machines, that require us to manually provide inputs, AI, just like a human being, is capable of naturally noticing, identifying and making comparisons. Google's DeepMind, Amazon's Alexa and Uber's self driving cars are all examples of this.

These are all bound to make human life radically easier. Soon, our transport systems will get entirely automated. Human beings will no longer be risking their lives doing dangerous jobs like defusing bombs. Amputees will have a much easier life with robotic limbs that will provide more control over their body, via AI. Big Data Analytics through AI, conducted on huge volumes of information, can also help find solutions to pressing issues like Global Warming and aid in cancer research. Robots like "Pepper" are even making humans happier, by serving as friends.

But with this newfound ease, is there not going to be a corresponding increase in human lack? This kind of technology is going to pamper us, and make us a lot lazier and less driven. Even without much of AI today, this world has a lot of luxury. Despite this, physical and mental troubles ravage us. Family and relationships don't matter as much as they used to. Everyone is constantly glued to their devices and drowning in the internet, but they don't even have the courtesy to smile to the person standing next to them or spend some talking to a friend. This kind of infinitely progressing technology is taking us further away from who we are as human beings. Apart from eating away on employment, the borders between human and machine are getting blurred- making us undermine and undervalue human companionship, human worth and human values.

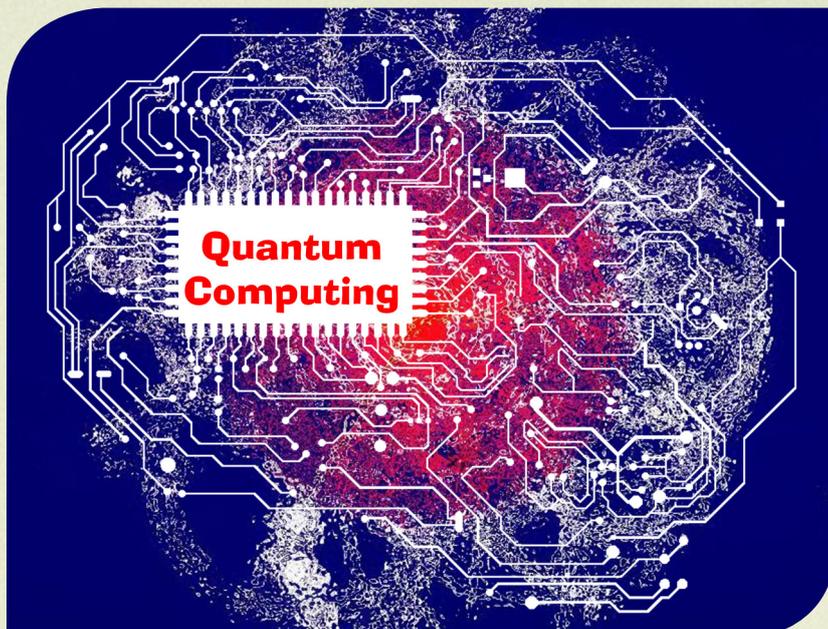
So, we need to keep questioning ourselves, where is technology really taking us? Up or Down? If we want the answer to always be positive, we need to regulate our technology with utmost care. We need to learn to restrict our human inclination towards ease and realize that the easy way is not always the best. This very ease, is taking away the joy and the usefulness of our lives, on multiple dimensions. We need to understand this, and strike a balance between technology and their role in our lives.

A PROGRAMMING LANGUAGE FOR QUANTUM COMPUTERS

Microsoft has announced that it's ready to fully support quantum computing and wants to encourage developers to follow its lead. The company has created a new programming language so that coders can write their first quantum programs. To use this language, the developers will need to have a good understanding about quantum logic gates and their operations.



Jobin Johnson
S3-CSE-Beta



Microsoft unveiled its quantum toolkit during its Ignite event. Although quantum computing is still highly experimental, the foundations are slowly being constructed for the future of technology. To help drive innovation in the field, Microsoft has created a quantum computing simulator that developers can run on their own machine.

It's integrated into the company's Visual Studio programming environment and includes its own unnamed programming language. Using the toolkit, developers will be able to write, debug and run quantum programs which can be deployed without modifications to Microsoft's real quantum computer.

The toolkit expands quantum computing into "mainstream" development, enabling developers to start honing their skills by creating and running actual programs. As of now, quantum technology has been restricted to small groups of experts at the major tech firms. Integrating quantum computing into Visual Studio gives any developer the chance to start exploring the technology, widening the available talent pool for firms

working in the field.

This programming language for quantum computers does possess a similarity to existing programming languages which are familiar to us and the developers will be able to borrow elements from Python, C#, and F# for writing function, etc.

To write code using these languages and run them, Microsoft will be launching two versions of a quantum simulator. One which will run locally, and the other one which will be powered by Microsoft's Azure cloud. The local version of the simulator will offer up to 32 qubits and require at least 32GB of RAM.

ARE HOME SECURITY APPS AND TECH AS SAFE AS THEY PROMISE?

We're entering the generation of the internet-of-things (IoT), where all our devices and appliances are connected to the cloud, and we can remotely access and control just about anything with our smart phones. One of the most exciting advancements in the world of IoT deals with providing home security; more advanced devices, like camera's,



Aiswarya V
S3-CSE-Alpha



and apps allow the average homeowner to keep a closer eye on their property. But are these "secure" advancements really as secure as they promise?

FEATURES TO EXPECT:

There are dozens of apps and devices available to secure your property. Some of these include Vivint Sky, which allows you to lock and unlock your doors, set your alarm remotely, and even control lighting around your house, ADT Pulse, which allows voice recognition to authenticate users, and Nest, which offers both indoor and outdoor cameras.

Some of the most common functionalities you'll see include:

- Indoor/outdoor cameras (and remote viewing). Cameras are one of the biggest draws for homeowners, and almost every tech security company offers them. These cameras can be indoor or outdoor, and provide constant remote access so you can view their feeds remotely, or review old footage.
- Remote door lock controls. Some apps also allow for remote door lock controls, so you can see who's knocking at your door and lock or unlock it accordingly.
- Alerts and alarms. Most apps offer alarm system functionality, allowing you to engage or disengage a basic home security alarm, and set alerts for various happenings in and around your property. For example, you might set an alert to go off if your door is

opened, if a window is broken, or if a motion detector is triggered on your lawn.

- Lighting controls. You may also have access to lighting controls, which allow you to switch your internal and external lights on and off.

Consumers are using these features both to secure their main properties and to add a layer of protection and value to their rental properties. But can they really deter crime? And is it possible they add more security vulnerabilities than they compensate for?

THE ISSUES:

These are some of the biggest issues to consider:

- Remote viewing. One of the best features of IoT home security is also its greatest vulnerability: a connected camera grants remote viewing access of your home. In a secure setting, this means you can see what's going on in and around your house at all times. But if someone gains control of that device with malicious intent, they'll also gain that same visibility. This could allow someone to learn your patterns, or even detect when you're not home to learn the best time to strike.
- Points of vulnerability. Each new device or app you add to your home represents another point of vulnerability. If a hacker or criminal gains access to just one device on the network, it's easy to gain access to the entire network. More points of vulnerability means it's easier for someone to gain control of every piece of technology you own.
- Stored information. Every security tech company is different, but some will store your security camera footage in the cloud for an extended period of time (at least 30 days). There are some advantages to this; you can go back and view footage if there's an incident you need to investigate. But it also compromises your privacy, since a breach of those central servers could give an attacker complete access to your home's cameras.
- Overconfidence. Finally, adding a layer of technological security to your home could give you a sense of overconfidence. Knowing you have the app's protection could make you lazier when it comes to double checking your home's security standards, or make you believe you're completely exempt from being the victim of a crime. Ironically, these new lax standards could make you more vulnerable.

Today's IoT-based home security devices are astounding, and if used correctly can make your home more secure. However, they also introduce some new vulnerabilities and issues that must be considered if you want to keep your home secure. Do your research before investing in any new app or device, and don't let yourself become overconfident in the tech that surrounds you.

MAKING DATA CENTERS MORE ENERGY EFFICIENT



Abhinav Thomas
S7 CSE Alpha

Most modern websites store data in databases, and since database queries are relatively slow, most sites also maintain so-called cache servers, which list the results of common queries for faster access. A data center for a major web service such as Google or Facebook might have as many as 1,000 servers dedicated just to caching. Cache servers generally use random-access memory (RAM), which is fast but expensive and power-hungry. This week, at the International Conference on Very Large Databases, researchers from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) are presenting a new system for data center caching that instead uses flash memory, the kind of memory used in most smartphones. Per gigabyte of memory, flash consumes about 5 percent as much energy as RAM and costs about one-tenth as much. It also has about 100 times the storage density, meaning that more data can be crammed into a smaller space. In addition to costing less and consuming less power, a flash caching system could dramatically reduce the number of cache servers required by a data center.

The drawback to flash is that it's much slower than RAM. "That's where the disbelief comes in," says Arvind, the Charles and Jennifer Johnson Professor in Computer Science Engineering and senior author on the conference paper. "People say, 'Really? You can do this with flash memory?' Access time in flash is 10,000 times longer than in DRAM [dynamic RAM]."

But slow as it is relative to DRAM, flash access is still much faster than human reactions to new sensory stimuli. Users won't notice the difference between a request that takes .0002 seconds to process a typical round-trip travel time over the internet and one that takes .0004 seconds because it involves a flash query.

Keeping pace the more important concern is keeping up with the requests flooding the data center. The CSAIL researchers' system, dubbed BlueCache, does that by using the common computer science technique of "pipelining." Before a flash-based cache server returns the result of the first query to reach it, it can begin executing the next 10,000 queries. The first query might take 200 microseconds to process, but the responses to the succeeding ones will emerge at .02- microsecond intervals.

Even using pipelining, however, the CSAIL researchers had to deploy some clever engineering tricks to make flash caching competitive with DRAM caching. In tests, they compared BlueCache to what might be called the default implementation of a flash-based cache server, which is simply a data-center database server configured for caching. (Although slow compared to DRAM, flash is much faster than magnetic hard drives, which it has all but replaced in data centers.) BlueCache was 4.2 times as fast as the default implementation. Joining Arvind on the paper are first author Shuotao Xu and his fellow MIT graduate student in electrical engineering and computer science Sang-Woo Jun; Ming Liu, who was an MIT graduate student when the work was done and is now at Microsoft Research; Sungjin Lee, an assistant professor of computer science and engineering at the Daegu Gyeongbuk Institute of Science and Technology in Korea, who worked on the project as a postdoc in Arvind's lab; and Jamey Hicks, a freelance software architect and MIT affiliate who runs the software consultancy Accelerated Tech.

The researchers' first trick is to add a little DRAM to every BlueCache flash cache a few megabytes per million megabytes of flash. The DRAM stores a table which pairs a database query with the flash-memory address of the corresponding query result. That doesn't make cache lookups any faster, but it makes the detection of cache misses the identification of data not yet imported into the cache much more efficient. That little bit of DRAM doesn't compromise the system's energy savings. Indeed, because of all of its added efficiencies, BlueCache consumes only 4 percent as much power as the default implementation. Engineered efficiencies Ordinarily, a cache system has only three operations: reading a value from the cache, writing a new value to the cache, and deleting a value from the cache. Rather than rely on software to execute these operations, as the default implementation does, Xu developed a special-purpose hardware circuit for each of them, increasing speed and lowering power consumption. Inside a BlueCache server, the flash memory is connected to the central processor by a wire known as a "bus," which, like any data connection, has a maximum capacity.

BlueCache amasses enough queries to exhaust that capacity before sending them to memory, ensuring that the system is always using communication bandwidth as efficiently as possible. With all these optimizations, BlueCache is able to perform write operations as efficiently as a DRAM-based system. Provided that each of the query

results it's retrieving is at least eight kilobytes, it's as efficient at read operations, as well. (Because flash memory returns at least eight kilobytes of data for any request, its efficiency falls off for really small query results.) BlueCache, like most data-center caching systems, is a so-called key-value store, or KV store. In this case, the key is the database query and the value is the response. "The flash-based KV store architecture developed by Arvind and his MIT team resolves many of the issues that limit the ability of today's enterprise systems to harness the full potential of flash," says Vijay Balakrishnan, director of the Data Center Performance and Ecosystem program at Samsung Semiconductor's Memory Solutions Lab. "The viability of this type of system extends beyond caching, since many data-intensive applications use a KV-based software stack, which the MIT team has proven can now be eliminated. By integrating programmable chips with flash and rewriting the software stack, they have demonstrated that a fully scalable, performance enhancing storage technology, like the one described in the paper, can greatly improve upon prevailing architectures."

MIKO -A BRAIN WITH LOADS OF HEART

EMOTIX is a consumer Electronics Company founded on the pillars of Robotics, Artificial Intelligence, and Internet of Things. It was founded in October, 2014 by three IIT Bombay post-graduates, and is today driven by a twenty-member team of roboticists, academicians, and neuropsychologists.



Aiswarya Shanker
S7 CSE Alpha



The core team of roboticists has been together since 2009, making some of the world's most widely acclaimed robots. Among these are India's most capable autonomous underwater vehicles, which ranked among the best internationally and performed Navy based tasks. Once equipped with a deep understanding of artificial intelligence and robotics, and having gained experience in the top technology companies of the world, the team wanted to use their under-

standing of these fields to solve a real societal challenge. The findings of extensive market research pointed to the direction of the need to bring robotics into Indian homes, and most importantly to Indian families. This brought about the birth of Miko, India's first companion robot.

Miko engages, educates, and entertains a child better than a television, a computer, a smartphone, or a tablet ever will. Miko is a gizmo, buddy, and developmental aid all rolled into a puppy-sized package.

Features:

1. Knowledge base: Miko has an inbuilt knowledge base and access to more via the internet
2. Social interaction: Miko talks and responds, and learns information about your child to guide their interactions
3. Adaptive personality: Miko grows with your child and adapts to cater to specific needs.
4. Emotional belief system: Miko knows right from wrong and can guide your child
5. Parental control and safety: You can provide the rules for your child's interactions with Miko.
6. Fun and educational games: Your child can learn through games inbuilt in the My Miko app.
7. Compatibility: Miko connects with iPhones and Android-enabled smartphones using the My Miko app available on the Play Store on Android and App Store on iOS devices.
8. Social interaction: Miko talks and responds, and learns information about your child to guide their interactions.
9. Adaptive personality: Miko grows with your child and adapts to cater to specific needs.
10. Emotional belief system: Miko knows right from wrong and can guide your child.
11. Parental control and safety: You can provide the rules for your child's interactions with Miko.
12. Fun and educational games: Your child can learn through games inbuilt in the My Miko app.

MAJOR ACHIEVEMENTS

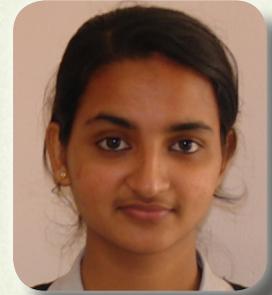
TOPPERS OF 2016-2017 ACADEMIC YEAR



POOJA VINOD
S2 CSE



JUBITTA JOHN
S4 CSE



ELIZABETH BENNY
S6 CSE

SPORTS

STUDENTS SELECTED TO THE UNIVERSITY (APJKTU) VOLLEYBALL TEAM,17-18



BESTINA PARIYATH
S1 CSE



MARIA JOHNSON
S5 CSE



RIYA FRANCIS
S5 CSE

STUDENTS SELECTED TO THE UNIVERSITY (APJKTU) BASKETBALL TEAM,17-18



STEPHY ROMICHAN
S3 CSE



RINU SIBI KURIAN
S5 CSE

CYBERBLITZ ACTIVITIES (2016-2017)

Serial No:	Event / Program / Competition	Date	Description
1	Debate competition - 'Cyber Thoughts'	01/02/2017	Topic: "Technological Advancements and Health Issues"
2	Multimedia based technical Quiz - "CyberQ"	22/02/2017	Technical quiz for students
3	Team building activity - "Renuntio"	22/02/2017	Team building activity for students
4	Wikipedia based data mining competition - 'WikiClick'	31/03/2017	Mining competition
5	Web designing competition - 'Webbed'	31/03/2017	Designing competition
6	Quiz Competition	18/09/2017	Quiz competition for students
7	The inauguration of "CyberBlitz 2017-2018" & Kick starting the initiative "Hello World - School Program" where the students of the Department of Computer Science and Engineering, RSET will give training for the students of other colleges and schools state wide.	25/09/2017	The inauguration of "CyberBlitz 2017-2018" - Association of Department of Computer Science & Engineering was done on 25/09/2017 by Mr. Manoj Alappat, Account Manager at UST Global, InfoPark, Kochi.
8	Talk on "IT Industry Technology Trends"	25/09/2017	Talk by Mr. Manoj Alappat, Account Manager at UST Global, InfoPark, Kochi.
9	A technical competition (prelims) - 'Cyber Triathlon' - Identifying the personalities from image hidden under blocks and aptitude questions.	11/09/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering organized a technical competition (prelims) - 'CYBER TRIATHLON' on 11/09/2017 with the aim of introducing the eminent personalities in the domain of Computer Science & Engineering
10	A technical competition (finals) - 'Cyber Triathlon' - Technical Quiz	23/10/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering organized a debate competition - 'Cyber Thoughts 2.0' on 27/10/2017 for the first year students of the department of Computer Science and Engineering.

11	An image designing contest – 'Diseño'	24/10/2017 to 01/11/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering organized an image designing contest – 'Diseño' with the aim of exploring the creativity and image designing skills of the students of RSET.
12	A debate competition - 'Cyber Thoughts 2.0'	27/10/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering organized a debate competition - 'Cyber Thoughts 2.0' on 27/10/2017 for the first year students of the department of Computer Science and Engineering.
13	An extracurricular event - 'IGRATO-Moving with the Rhythm' – Dance Competition	31/10/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering organized an extracurricular event - 'IGRATO-Moving with the Rhythm' on 31/10/2017 with the aim of honing and exhibiting the dancing and choreography skills of the students of CSE.
14	A coding competition - 'Code Re'	03/11/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering organized a coding competition - 'Code Re' on 03/11/2017 for the first year students of the department of Computer Science and Engineering.
15	An android application development workshop - 'App-Forbairt'	06/11/2017 to 06/04/2018	'CyberBlitz', the association of the Department of Computer Science and Engineering in association with department IEDC cell is organizing an android application development workshop - 'App-Forbairt' from 06/11/2017 for the students of the department of Computer Science and Engineering.
16	A coding competition - 'Code Dios'	03/11/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering organized a coding competition - 'Code Dios' on 03/11/2017 for the second year and third year students of the department of Computer Science and Engineering.

17	An invited session on "Machine Learning and Artificial Intelligence/ Robotics and Crypto-Currencies and Block Chain"	06/11/17	Sunya Labs in association with CyberBlitz (Association of DCS) organized an invited session on "Machine Learning and Artificial Intelligence/Robotics and Crypto-Currencies and Block Chain" by Mr. Joseph Ponnoly, Technology and Management Consultant based in Houston, TX, USA on 06/11/17 (Monday).
18	A computer gaming competition - 'GIOCO'	10/11/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering in association with Department IEDC cell organized a computer gaming competition - 'GIOCO' on 10/11/2017 for the first year students of the department of Computer Science and Engineering.
19	A computer gaming competition - 'GIOCO MASTERS'	10/11/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering in association with Department IEDC cell is organizing a computer gaming competition - 'GIOCO MASTERS' on 10/11/2017 for the second year and third year students of the department of Computer Science and Engineering.
20	A musical competition - 'Rhythm' – Singing competition	13/11/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering organized a musical competition - 'Rhythm' on 13/11/2017 for the students of the department of Computer Science and Engineering.
21	A dubsplash competition 'Interino' – Acting competition	13/11/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering organized a dubsplash competition 'Interino' on 13/11/2017 for the students of the department of Computer Science and Engineering.

22	A Debugging competition - 'Bug Entferner - Masters'	17/11/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering organized a Debugging competition - 'Bug Entferner - Masters' on 17/11/2017 for the second year and third year students of the department of Computer Science and Engineering.
23	First venture of "Hello World – School Program"	22/11/2017	'CyberBlitz', the association of the Department of Computer Science and Engineering in association with Department Talent club is jointly organizing a program- "HELLO WORLD", to give opportunity to the students of the Dept. of Computer Science and Engineering for conducting training for the students of other colleges and schools state wide. As the first initiative, selected students of the Dept. of Computer Science and Engineering will be taking "Workshop on ICPS (Introduction to Computing and Problem Solving)" for the students of ILM College of Engineering, Perumbavoor on 22/11/2017.

On Desk

Coordinators



Ms. JISHA MARY JOSE



Ms. MEENU MATHEW



Ms. ASHA RAJ

Illustrations : Nithin P Vijayan