K.S.Rangasamy College of Arts & Science
(Autonomous)
Ksr Kalvi Nagar,Tiruchengode-637215.Namakkal Dist.
Tamil Nadu,INDIA.

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Ishare

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Editorial

We would like to wholeheartedly thank our honorable Chairman, Secretary, Executive Director and Principal for their continuous encouragement and constant support for bringing out the magazine. We profoundly thank our Head of the Department for encouraging and motivating us to lead the magazine a successful one right from the beginning. Ishare serves as a platform for updating and enhancing upcoming technologies in Information and Communication. We are grateful to all the contributors to this magazine so far. The magazine has been sent to almost 60 Institutions in and around Tamilnadu. So far we have received feedbacks and appreciations from various Institutions.

We would be very pleased to receive your feedbacks. Please send your feedbacks to ishare@ksrcas.edu

By,

Editorial Board

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SPECIALITIES OF SOME NUMBERS IN MULTIPLICATION

Ms. G. MANGAIYARKARASI

ASST. PROFESSOR IN COMPUTER APPLICATIONS

Specialty of 9:

Multiplying a number should be a 9- series number and the multiplied number should have the same digits.

E.g :1

4348 x 9999 = 43475652

❖ **Explanation:**

4348 x (10000 - 1)

= 43480000 – 4348 = 43475652

E.g :2

329 x 999 = 328671

❖ **Explanation:**

329 x (1000 -1)

= 329000 - 329 = 328671

Specialty of 1:

- **Model I**

Multiplier and Multiplicand are 1-series with equal number of digits.

E.g:

11111 x 11111 = 123454321

❖ **Explanation:**

If the answer the first 5 digits are in the increasing order from 1 and next 4 digits are in decreasing order after 5.

1111 x 1111 = 1234321

❖ **Explanation:**

If the answer the first 4 digits are in the increasing order from 1 and next 3 digits are in decreasing order after 4.

- **Model II**

If the number of digits in the multiplying number is less than the number of digits in the multiplied number and both are 1- series.

E.g:

11111 x 111 = 1233321

❖ **Explanation:**

Step 1: Number of ones in multiplier is 3. So write 123.

Step 2: Difference in number of digits in Multiplicand and Multiplier is 2. So repeat 3 two times.

Step 3: Next two digits are in decreasing order after 3.

111111 x 111 = 12333321

❖ **Explanation:**

Step 1: Number of ones in multiplier is 3. So write 123.

Step 2: Difference in number of digits in Multiplicand and Multiplier is 3. So repeat 3 three times.

Step 3: Next two digits are in decreasing order after 3.

NEW TRENDING ANDROID APPS FOR KIDS

Mr. J.SATHISH

ASST. PROFESSOR IN COMPUTER APPLICATIONS

- ***APPLICATION NAME : LULLABY***

Speed up the process of putting your baby to sleep with **Lullaby for Babies.** This lullaby app offers relaxing bedtime tunes with good sound quality that is guaranteed to let a baby sleep like an angel. It comes with a pre-set timer (10 minutes, 20 minutes and so on) for baby's convenience.

- ***APPLICATION NAME : BABY SNOOZE***

When it comes to helping baby fall asleep, nothing compares to the relaxing sounds she heard and experienced while still in womb. This app helps babies feel as if they're still in the safety and comfort of an enclosed space by replicating the calming noises of a steady heartbeat and low-frequency whooshing and rumbling.

- ***APPLICATION NAME :BABY SHUSHER***

It provides the rhythmic, soothing shushing sound. The timing feature allows keeping the noise going, and the sound equalizer automatically adjusts the volume if the baby starts crying over it.

- ***APPLICATION NAME :BABY SLEEP CARE PRO***

The Baby Sleep Care Pro app is so much more than just a sleep device for babies. Not only we can record 5, 10, or 20

seconds of the noise that best helps the baby fall asleep , but it also detects any noise coming from the sleeping baby. Once it detects a noise, the app has the ability to call a phone number that we have provided ahead of time, so we can listen to what's happening. The log option also records information related to when our baby wakes.

- ***APPLICATION NAME: GOODNIGHT SAFARI***

Slightly different from traditional sleep-time apps, Goodnight Safari is a beautiful, gentle bedtime-story app that puts children (ages 2 to 4) at the center of the action. Kids help prepare some African savanna animals (lions, giraffes, and elephants) for their sleep with simple bedtime routines. The interactive app has a calming narration that will help kids wind down, increase their comfort with nighttime routines, and fall asleep faster.

EVOLUTION OF MOBILE TECHNOLOGY

Ms. J.RATHI

ASST. PROFESSOR IN COMPUTER SCIENCE

- **INTRODUCTION**

Mobile phone technology is continuously evolving, seemingly at an accelerating rate of innovation and adoption. Examining the strides taken from 1G to 4G, the technology has both created new usage patterns and learned from unexpected use cases. Here's a brief history of mobile telephony.

EARLY HISTORY OF MOBILE TECHNOLOGY

- In 1857, Clark Maxwell derived a theory of electromagnetic radiation, which Guglielmo Marconi used as a basis for the invention of radio transmission in 1901.
- This was a great achievement, however, it was unable to achieve reasonable data transmission rates for over a half-century.
- The first precursors to modern mobile telephony were introduced in the late 1940s in the United States and in the 1950s in Europe.
- These early "mobile" phones were heavily constrained by limited mobility and poor service.
- The devices were heavy and also extremely expensive.

1G: First Generation Cellular Phones

- In the 1970s, the First Generation, or 1G, mobile networks were introduced. These systems were referred to as cellular, which was later shortened to "cell", due to the method by which the signals were handed off between towers.
- Cell phone signals were based on analog system transmissions, and 1G device were comparatively less heavy and expensive than prior devices.
- Some of the most popular standards deployed for 1G system were Advanced Mobile Phone System (AMPS), Total Access Communication Systems (TACS) and Nordic Mobile Telephone (NMT).

- The global mobile phone market grew from 30 to 50 percent annually with the appearance of the 1G network, and the number of subscribers worldwide reached approximately 20 million by 1990.

2G: GSM and GPRS Networks

- In the early 1990s, 2G phones deploying GSM technology were introduced.
- Global System for Mobile communications or GSM uses digital modulation to improve voice quality but the network offers limited data service.
- As demand drove uptake of cell phones, 2G carriers continued to improve transmission quality and coverage.
- The 2G carriers also began to offer additional services, such as paging, faxes, text messages and voicemail.
- The limited data services under 2G included WAP, HSCSD and MLS.
- An intermediary phase, 2.5G was introduced in the late 1990s.
- It uses the GPRS standard, which delivers packet-switched data capabilities to existing GSM networks.
- It allows users to send graphics-rich data as packets.
- The importance for packet-switching increased with the rise of the Internet and the Internet Protocol, or IP.
- The EDGE network is an example of 2.5G mobile technology.

- ***Recent 3G Networks***

- The 3G revolution allowed mobile telephone customers to use audio, graphics and video applications.
- Over 3G it is possible to watch streaming video and engage in video telephony, although such activities are severely constrained by network bottlenecks and over-usage.
- One of the main objectives behind 3G was to standardize on a single global network protocol instead of the different standards adopted previously in Europe, the U.S. and other regions.
- 3G phone speeds deliver up to 2 Mpbs, but only under the best conditions and in stationary mode.
- Moving at a high speed can drop 3G bandwidth to a mere 145 Kbps.
- 3G cellular services, also known as UMTS (Universal Mobile Telecommunications Systems), sustain higher data rates and open the way to Internet style applications.
- 3G technology supports both packet and circuit switched data transmission, and a single set of standards can be used worldwide with compatibility over a variety of mobile devices.
- UMTS delivers the first possibility of global roaming, with potential access to the Internet from any location.

High-Speed 4G Mobile Networks

- The current generation of mobile telephony, 4G has been developed with the aim of providing transmission rates up to 20 Mbps while simultaneously accommodating Quality of Service (QoS) features.

- QoS will allow you and your telephone carrier to prioritize traffic according to the type of application using your bandwidth and adjust between your different telephones needs at a moment's notice.

- Only now we are beginning to see the potential of 4G applications. They are expected to include high-performance streaming of multimedia content.

- The deployment of 4G networks will also improve video conferencing functionality.

- It is also anticipated that 4G networks will deliver wider bandwidth to vehicles and devices moving at high speeds within the network area.

EXTENSIBLE MARKUP LANGUAGE

Ms. C.SASIKALA

ASST. PROFESSOR IN COMPUTER SCIENCE

- XML stands for EXtensible Markup Language.
- XML is a markup language much like HTML.
- XML was designed to describe data, not to display data.
- XML tags are not predefined. You must define your own tags.
- XML is designed to be self-descriptive.
- XML is a W3C Recommendation.

The Difference Between XML and HTML

- XML is not a replacement for HTML.
- XML and HTML were designed with different goals:
  - XML was designed to describe data, with focus on what data is.
  - HTML was designed to display data, with focus on how data looks
  - HTML is about displaying information, while XML is about carrying information.

With XML You Invent Your Own Tags

- The tags like <to> and <from> are not defined in any XML standard. These tags are "invented" by the author of the XML document.
- That is because the XML language has no predefined tags.
- The tags used in HTML are predefined. HTML documents can only use tags defined in the HTML standard (like <p>, <h1>, etc.).

- XML allows the author to define his/her own tags and his/her own document structure.

ROBOTICS

Ms. K. MEENAMBIGAI

ASST. PROFESSOR IN COMPUTER SCIENCE

Robotics is the branch of Mechanical Engineering, Electrical Engineering and Computer Science that deals with the design, construction, operation, and application of Robots, as well as computer systems for their control, sensory feedback, and information processing.

These technologies deal with automated machines that can take the place of humans in dangerous environments or manufacturing processes, or resemble humans in appearance, behavior, and/or cognition. Many of today's robots are inspired by nature contributing to the field of Bio-inspired Robotics.

The concept of creating machines that can operate autonomously dates back to classical times, but research into the functionality and potential uses of robots did not grow substantially until the 20th century. Throughout history, robotics has been often seen to mimic human behavior, and often manage tasks in a similar fashion.

Today, robotics is a rapidly growing field, as technological advances continue; researching, designing, and building new robots serve various

practical purposes, whether domestically, commercially, or militarily. Many robots do jobs that are hazardous to people such as defusing bombs, mines and exploring shipwrecks.

Evolutionary robotics (ER) is a methodology that uses evolutionary computation to develop controllers for autonomous robots. Algorithms in ER frequently operate on populations of candidate controllers, initially selected from some distribution. This population is then repeatedly modified according to a fitness function.

In the case of genetic algorithms (or "GAs"), a common method in evolutionary computation, the population of candidate controllers is repeatedly grown according to crossover, mutation and other GA operators and then culled according to the fitness function. The candidate controllers used in ER applications may be drawn from some subset of the set of artificial neural networks, although some applications (including SAMUEL, developed at the Naval Center for Applied Research in Artificial Intelligence) use collections of "IF THEN ELSE" rules as the constituent parts of an individual controller.

It is theoretically possible to use any set of symbolic formulations of a control law (sometimes called a policy in the machine learning community) as the space of possible candidate controllers. Artificial neural networks can also be used for robot learning outside of the context of evolutionary robotics. In particular, other forms of reinforcement learning can be used for learning robot controllers.

Applications

- Caterpillar plans to develop remote controlled machines and expects to develop fully autonomous heavy robots by 2021. Some cranes already are remote controlled.
- It was demonstrated that a robot can perform a herding task.
- Robots are increasingly used in manufacturing (since the 1960s). In the auto industry they can amount for more than half of the "labor". There are even "lights off" factories such as an IBM keyboard manufacturing factory in Texas that is 100% automated.
- Robots such as HOSPI are used as couriers in hospitals (hospital robot). Other hospital tasks performed by robots are receptionists, guides and porters helpers, (not to mention surgical robot helpers such as Da Vinci)
- Robots can serve as waiters and cooks. Also at home. Boris is a robot that can load a dishwasher.

GOOGLE ENVISIONS ROBOT REMOTE CONTROLS THAT KNOW YOUR FACE

Ms. S.GOWRI

ASST. PROFESSOR IN COMPUTER SCIENCE

A Google patent filing envisions a teddy robot toy acting as a smart remote control. Cuddly robot toys such as Furby or AIBO the robot dog have won many human

hearts and minds over the past decade. That may be why Google researchers envision the possibility of turning such robot toys into intelligent remote controls for home entertainment systems. But the idea of a teddy bear or doll constantly watching or listening in a home has already stirred some controversy about home privacy.

A Google patent application spotted by SmartUp, a legal technology firm, describes how an "anthropomorphic device" with hidden cameras for eyes and microphones for ears could automatically translate simple voice commands into actions that activate smart TVs, DVRs, DVD players and other devices. Instead of manually pushing buttons on remote controls or even a large universal remote control, people could simply tell their robot remote control to stream the latest episode of a favorite TV show through their Blu-ray player or Apple TV.

The Google patent — filed in 2012 but published on the U.S. Patent and Trademark Office website on May 21, 2015 — suggests that the anthropomorphic device could simplify the process of accessing TV shows and movies through the growing swarm of home devices and online services. The patent also includes drawing concepts for the lovable robot toy as a teddy bear and a stuffed rabbit.

"There are at least some advantages to an anthropomorphic device taking on a familiar, toy-like, or "cute" form…" according to the Google patent application. "Some users, especially young children, might find these forms to be attractive user interfaces. However, individuals of all

ages may find interacting with these anthropomorphic devices to be more natural than interacting with traditional types of user interfaces."

The device — let's just call it "Teddy" — would work something like this. If Teddy detects a person in the room, it would look at that person so that its camera and microphones are pointed in his or her direction. The Teddy might simply recognize the person visually through its camera. Or it might turn its head in the direction of the person based on the sound of his or her voice.

A person could also directly address Teddy by name or by using certain keywords, which would be Teddy's cue to look in his or her direction. Teddy might even use video captured by its camera to read the lips of someone speaking, in case the audio coming in through the microphone is too soft or distorted.

The Teddy may not necessarily take the form of a physical toy; Google's patent application also allows for the possibility of a hologram or a virtual avatar that only appears on a screen. But the main function of being able to translate voice commands into actions for coordinating home media devices would remain the same in any case. Google's patent specifically describes the possibility of the Teddy device communicating with a "cloud-based" online server that could handle much of the computer processing. Alternately, the Teddy device might be a more capable robot with its own self-contained computer processing power and data storage.

They See You When They're Sleeping

It's worth keeping in mind that companies file patents all the time which never translate into commercial products. Still, Google's patent idea for a smart Teddy has already led to some alarm. Representatives for watchdog groups expressed worries about a cuddly device capable of constantly monitoring people with cameras and microphones.

"The privacy concerns are clear when devices have the capacity to record conversations and log activity," said Emma Carr, Director of Big Brother Watch, in a *BBC News* interview. "When those devices are aimed specifically at children, then for many this will step over the creepy line."

Google's patent idea includes a description of how Teddy might still be listening or detecting movement even when it appears to be "asleep." This makes sense if you want to save battery power for Teddy by having a "sleep mode" that still allows it to respond when needed, but it does admittedly come off sounding a bit eerie.

It should be noted that while the anthropomorphic devices described herein may have eyes that can "close," or may be able to simulate "sleeping," the anthropomorphic devices may maintain their camera and microphones in an operational state. Thus, the anthropomorphic devices may be able to detect movement and sounds even when appearing to be asleep. Nonetheless, when in such a "sleep mode" an anthropomorphic device may deactivate or limit at least some of its functionality in order to use less power.

Other possibilities for Teddy include having a "profile" of each resident in a home. That would allow Teddy to tailor its actions and responses to individual residents, but it would need to store representative voice samples or possibly a facial picture so that it could recognize people by their voice or face. A separate Google patent application on robots with multiple personalities tailored to the preferences of individual people — even personalities based on dead celebrities or family members — could also theoretically come into play and allow a Teddy to change its behavior based on the person it's interacting with.

How Robot Remote Controls Can Respect Privacy

The early concerns swirling around Google's patent idea are similar to those that have arisen around existing smart devices designed for home entertainment. For example, Samsung's Smart TVs have a voice recognition system that allows people to change the channel or volume level with voice commands. Such smart TVs already caused some controversy over fears that they were recording people's living room conversations, which prompted Samsung to post a clarification about the data being stored. Similarly, Microsoft had to assuage privacy concerns over its Xbox One and Kinect accessory that can capture videos, photos, facial expressions and even read heart rates.

For the most part, Google's patent idea for Teddy seems to mainly put a personable face on existing home entertainment devices; it's the difference between interacting with a cuddly robot toy and a faceless

remote control or device. It also hints at a possible future of homes filled with social robots designed to interact well with humans. Such social robots would likely have many, if not most, of the capabilities found in Google's patent filing.

Certain design choices may lead people to see a Teddy device or social robots as behaving in a creepy manner, but they don't necessarily compromise home privacy any more than the Microsoft Kinect or any existing devices that can silently monitor people's behaviors. It's up to companies to have transparent privacy policies that explain what a Teddy or any smart device can or can't do. If companies also clearly allow customers to set privacy levels on devices, that may go a long way toward reassuring fears over the future Teddy sitting on the couch.

"WHEN ROBOT PERSONALITIES MIMIC THE DEAD!?!"

Ms. A. NIRMALADEVI

ASST. PROFESSOR IN COMPUTER SCIENCE

Albert Hubo is a battery-powered, untethered walking robot based on the Hubo robot developed by the Korea Advanced Institute of Science and Technology. The robot's face, built by Hanson Robotics, is modeled on famed physicist Albert Einstein.

Hollywood actress Audrey Hepburn and martial arts legend Bruce Lee represent just a few of the dead celebrities whom have been

resurrected as digital avatars in TV commercials to sell products such as chocolate or whiskey. A Google patent raises a new possibility by describing robot personalities based upon the voices and behaviors of dead celebrities or loved ones. Such a vision may not necessarily come true, but it raises the question of whether people would feel comfortable dealing with a robot that actively mimics deceased people.

The patent awarded to Google on March 31, 2015, focuses on the idea of creating robot personalities that could be downloaded as software and transferred between different robots through an online service. It also describes the idea of creating customizable robot personalities tailored to the preferences of human users. That lays the groundwork for a future where robotic hardware could update and switch their software personalities based on the specific human customers they're serving. The patent also covers the idea of a base personality that act out different moods such as happiness, fear, surprise, and thoughtfulness. Google's patent even uses well-known celebrities — such as a perplexed "Woody Allen robot" or a derisive "Rodney Dangerfield robot" — to describe a range of possible robot moods.

"The personality could be multifarious, in the sense of multiple personalities, which may be selected by the robot according to cues or circumstances, or a personality could be selected by a user (a human)," according to the Google patent. "The robot may be programmed to take on the personality of real-world people (e.g., behave based on the user, a

deceased loved one, a celebrity and so on) so as to take on character traits of people to be emulated by a robot."

To be fair, companies frequently patent ideas that never become commercial products for one reason or another. On the other hand, Google has gone on a notable robot buying spree by snapping up at least eight robotics companies in six months just last year. The technology giant clearly sees a big future in robotics one way or the other. And as the patent suggests, the company has put some thought into how future robots might socially interact with humans on a more regular basis.

Bring Out Your Dead

Customizable robot personalities represent a logical extension of smartphone assistants such as Apple's Siri. But the "deceased love one" and "celebrity" personality examples described by the Google patent almost certainly won't meet with universal joy and acceptance if they ever become a reality. We only need to look at past commercials that resurrected deceased celebrities as computer-generated avatars to get some idea about the people's possible reactions, said Karl MacDorman, a robotics researcher at Indiana University. MacDorman has spent much of his research career studying the "uncanny valley," an idea that describes how certain human-like figures in animated films or robotics can come off as appearing eerie or creepy.

The idea of using dead celebrities in commercials was alive and well even before the arrival of modern computer-generated imagery (CGI)

techniques; older commercials simply combined old footage of the celebrities with new footage through computer compositing techniques. Remember John Wayne in all those Coors Light commercials? How about Fred Astaire dancing with a Dirt Devil vacuum cleaner? Or Audrey Hepburn being repurposed for selling Gap jeans?

More recently, the advancement of CGI technology has allowed advertising executives to direct the digital avatars of deceased celebrities in ways that they never acted before while still living. That has given rise to controversial cases such as a digital avatar of Orville Redenbacher cracking awkward jokes about mp3 players in a 2007 popcorn commercial. YouTube comments ranged from some people being impressed to others describing the digital avatar's look as "creepy" or like a "zombie."

MacDorman personally thought that the digital recreation of Redenbacher lacked authenticity, in part because the voice in the commercial failed to capture the real-life Redenbacher's distinctive Indiana accent. But the robotics researcher also conducted an informal poll of about 20 people to gauge their reactions to the Orville Redenbacher commercial.

"Some people thought it was Orville Redenbacher, and it didn't bother them at all," MacDorman said. "Others could tell it was computer generated. Others thought the idea of resurrecting Orville Redenbacher was really sick. There was quite a diversity of opinion."

In 2013, martial artist Bruce Lee was digitally resurrected for a Johnnie Walker whiskey ad. That commercial drew less controversy about the appearance of the digital avatar — perhaps because of the better CGI —

but still drew disapproving comments about the use of Lee's likeness to sell whiskey. Some people suggested that the whiskey commercial was disrespectful because Lee was a "health nut" who was never big on alcohol, according to *Time*.

Last year, actress Audrey Hepburn was given the digital avatar treatment in a Galaxy (Dove) chocolate commercial. That commercial was generally successful in winning over audiences, judging by the YouTube comments. Rather than having Hepburn hawk the product directly to customers, the commercial featured the digital Hepburn in a romantic scene vaguely reminiscent of some of her more famous Hollywood roles. It even plucked at heart strings with the inclusion of the famous song "Moon River" sung by Hepburn in the 1961 film "Breakfast at Tiffany's." Altogether, the commercial wisely allowed Hepburn to stay in character, MacDorman said.

Maybe some future robot owners might find it amusing or even comforting to have their robot speak and behave like their favorite celebrity, dead or alive. Whether or not such a future might happen depends in large part upon how celebrities and their descendants — or whatever entity owns the right to their likeness — choose to participate in such projects. For example, fans of deceased comedian Robin Williams might be either relieved or disappointed to find out that he chose to restrict exploitation of his likeness for at least 25 years after his death, according to the *Hollywood Reporter*.

We Have the Technology

But individuals could still choose whether or not they would want robot personalities based on a "deceased loved one." The technology may already exist for enabling a robot personality that can partially simulate a real-life person's personality. A real-life person's interactions with other people could provide behavioral data for developing a robot personality based on the person, MacDorman said. Ideally, the real-life person might even directly control the robot's behavioral actions for a while so that the robot could build up a database of behavior. Existing software can already create a synthesized version of someone's voice based on vocal samples.

The Google patent describes an example of how a personality program could vacuum up information from a person's smartphone or laptop to create a new personality based on a living or dead person:

Adoption of a personality, or some personification attributes, could be more direct, such as a simple user command to adopt a character by name: "Be mom"; "Become Gwynneth"; "Adopt persona Beta." The character (personality) may be a program already stored, or it could be something in the cloud. If the later, the robot would interact with the cloud to pull sufficient information regarding the "new" persona to thereby recreate a simulacrum for the robot. The information for the persona could also come from a user device. Such as, in response to a "Be mom" command, "mom" may not be known to the robot. The robot processor can then search user devices for information about "mom"… For example, the robot may be

able to determine "mom's" voice from recordings, and further how the user interacts with "mom" from text messages and recordings.

Google may or may not choose to ever provide future robot owners with such robot personality options. But whatever the legal situation, such options will almost inevitably spark broader discussions among individual families and within society as a whole about resurrecting the dead in robotic form.

"While an individual may find comfort in having a robot or digital double impersonate a deceased loved one, others may well find this creepy, and the practice could be stigmatized," MacDorman said.

LATEST TECHNOLOGIES

Ms. S. LATHA

ASST. PROFESSOR IN COMPUTER SCIENCE

Wireless charging

- Place a laptop on a table, and it'll automatically start charging. No wires needed, no need to carry a power brick. That's how Intel views wireless charging for laptops, which could become a reality next year. Intel wants to make wireless chargers as easy to find as a Wi-Fi signal, and wants to bring the technology to cafes, restaurants, airports and other public places so laptops can be recharged without power adapters. The first laptops with wireless charging could come out next year, and Intel has shown a few prototypes laptop being recharged on a table.
- Intel plans to make the wire-free future of the PC a reality as early as the first quarter of 2015.
- Intel is backing the Rezence magnetic resonance wireless charging technology, promoted by the Alliance for Wireless Power, or A4WP. The power flow will initially be limited, enough to wirelessly recharge ultraportables and hybrids. Plans call for increased power output to recharge mainstream laptops. But getting the technology to public places and entertainment spots could take some years. Some cafes and restaurants already provide wireless charging bases for tablets and smartphones, and are interested in adding laptops to the mix.
- It may also become possible to connect laptops wirelessly to displays, which could eliminate expensive HDMI or DisplayPort display cables. A wireless display will start working as soon as a laptop is within range. Intel envisions a laptop ultimately being able to connect to multiple wireless monitors, which could be useful in classrooms or meetings. One

laptop will be able to stream to monitors on multiple desks. Intel is pushing the initial idea through a "smart dock" that connects a laptop to a wireless monitor.

- Wireless displays will gain momentum with the growing adoption of WiGig, a faster version of Wi-Fi that can handle wireless 4K video streams without any lag. In addition to Intel, Qualcomm will bring WiGig to smartphones and tablets next year, so users will be able to stream Netflix directly from a smartphone or tablet to a wireless TV. Display makers will also build WiGig technologies into monitors and TVs in the coming years.

Creative desktops

- From its origin as a dull white box, the desktop has become a hub of creativity and imagination, with technologies like depth-sensing cameras and 3D printing spinning off a variety of innovations. One example is HP's Sprout, which looks like a normal all-in-one PC, but packs the latest imaging and collaboration technology. At the base of Sprout is a giant touch pad called a Touch Mat, which is a dual-purpose digital canvas on which images can be scanned and also manipulated. A 3D depth-sensing camera lodged in Sprout scans the objects placed on the Touch Mat -- for example, if a coffee mug is placed on the canvas, the 3D camera will scan it to depth and size. A projector on top of Sprout can then reflect the scanned image of a coffee mug on the Touch Mat, which artists can then manipulate by touching the digital canvas. HP says the scanning and

manipulation could be useful for creating objects that could be 3D-printed. But at $1,899, Sprout is considered an expensive experimental desktop.

Interactive computers

- Computers will become more perceptual with a combination of gesture, voice and visual recognition technologies being installed in PCs. Starting next year, 2D cameras in PCs will be replaced by Intel's RealSense 3D cameras, which will be able to recognize objects and even measure distances between items. The camera's Kinect-like gesture recognition capabilities will also make PC gaming hands free and interactive. Intel has lofty goals, aiming to combine visual, voice and sound input to recognize human moods and reading habits. While those won't happen in the coming year, the 3D camera will certainly make Skype chats more fun.

Biometric sensors

- Soon, your body could log you into an e-mail account. By the end of this year, Intel will be providing software so users can log in to websites via biometric authentication. It serves two purposes: biometric authentication is relatively reliable and secure, and users won't have to remember dozens of passwords for different sites. Apple already uses biometric authentication to authorize credit card payments through its Apple Pay service, and Intel wants to bring a similar concept to PCs. Expect the fingerprint reader to become more useful starting next year.

Thinner, faster, lighter, better

- Laptops, Tablets, Hybrids -- with so many options available, buying PCs isn't easy, and it won't get any easier next year with more innovative designs set to become available. Computers will get thinner as PC makers introduce laptops that are as thin as 15 millimeters. Computers will offer longer battery life with the new Broadwell and Skylake processors from Intel and Carrizo chips from Advanced Micro Devices. New DDR4 memory will make applications and games run faster in desktops.

MEMRISTOR

Ms. R.SANGEETHA

ASST. PROFESSOR IN COMPUTER SCIENCE

Definition

Memristor theory was formulated and named by Leon Chua in a 1971 paper. Chua strongly believed that a fourth device existed to provide conceptual symmetry with the resistor, inductor, and capacitor. This symmetry follows from the description of basic passive circuit elements as defined by a relation between two of the four fundamental circuit variables. A device linking charge and flux (themselves defined as time integrals of current and voltage), which would be the memristor, was still hypothetical at the time. However, it would not be until thirty-seven years later, on April 30, 2008, that a team at HP Labs led by the scientist R.

Stanley Williams would announce the discovery of a switching memristor. Based on a thin film of titanium dioxide, it has been presented as an approximately ideal device.

The reason that the memristor is radically different from the other fundamental circuit elements is that, unlike them, it carries a memory of its past. When you turn off the voltage to the circuit, the memristor still remembers how much was applied before and for how long. That's an effect that can't be duplicated by any circuit combination of resistors, capacitors, and inductors, which is why the memristor qualifies as a fundamental circuit element.

Need For Memristor

A memristor is one of four basic electrical circuit components, joining the resistor, capacitor, and inductor. The memristor, short for "memory resistor" was first theorized by student Leon Chua in the early 1970s. He developed mathematical equations to represent the memristor, which Chua believed would balance the functions of the other three types of circuit elements.

The known three fundamental circuit elements as resistor, capacitor and inductor relates four fundamental circuit variables as electric current, voltage, charge and magnetic flux. In that we were missing one to relate charge to magnetic flux. That is where the need for the fourth fundamental element comes in. This element has been named as memristor.

Memristance (Memory + Resistance) is a property of an Electrical Component that describes the variation in Resistance of a component with the flow of charge. Any two terminal electrical component that exhibits Memristance is known as a Memristor. Memristance is becoming more relevant and necessary as we approach smaller circuits, and at some point when we scale into nano electronics, we would have to take memristance into account in our circuit models to simulate and design electronic circuits properly. An ideal memristor is a passive two-terminal electronic device that is built to express only the property of memristance (just as a resistor expresses resistance and an inductor expresses inductance). However, in practice it may be difficult to build a 'pure memristor,' since a real device may also have a small amount of some other property, such as capacitance (just as any real inductor also has resistance).

A common analogy for a resistor is a pipe that carries water. The water itself is analogous to electrical charge, the pressure at the input of the pipe is similar to voltage, and the rate of flow of the water through the pipe is like electrical current. Just as with an electrical resistor, the flow of water through the pipe is faster if the pipe is shorter and/or it has a larger diameter.

BRAIN MAPPING

Mr. S.VIGNESHWARAN

ASST. PROFESSOR IN COMPUTER SCIENCE

Neuroscientists have made remarkable progress in recent years toward understanding how the brain works. And in coming years, Europe's Human Brain Project will attempt to create a computational simulation of the human brain, while the U.S. BRAIN Initiative will try to create a wide-ranging picture of brain activity. These ambitious projects will greatly benefit from a new resource: detailed and comprehensive maps of the brain's structure and its different regions.

A section of the human brain map created by a team of international researchers shows details as small as 20 micrometers.

As part of the Human Brain Project, an international team of researchers led by German and Canadian scientists has produced a three-dimensional atlas of the brain that has 50 times the resolution of previous such maps. The atlas, which took a decade to complete, required slicing a brain into thousands of thin sections and digitally stitching them back together with the help of supercomputers. Able to show details as small as 20 micrometers, roughly the size of many human cells, it is a major step forward in understanding the brain's three-dimensional anatomy.

To guide the brain's digital reconstruction, researchers led by Katrin Amunts at the Jülich Research Centre in Germany initially used an MRI machine to image the postmortem brain of a 65-year-old woman. The brain was then cut into ultrathin slices. The scientists stained the sections and then imaged them one by one on a flatbed scanner. Alan Evans and his coworkers at the Montreal Neurological Institute organized the 7,404 resulting images into a data set about a terabyte in size. Slicing had bent, ripped, and torn the tissue. So Evans had to correct these defects in the images. He also aligned each one to its original position in the brain. The result is mesmerizing: a brain model that you can swim through, zooming in or out to see the arrangement of cells and tissues.

At the start of the 20th century, a German neuro-anatomist named Korbinian Brodmann parceled the human cortex into nearly 50 different areas by looking at the structure and organization of sections of brain under a microscope. "That has been pretty much the reference framework that we've used for 100 years," Evans says. Now he and his coworkers are redoing Brodmann's work as they map the borders between brain regions. The result may show something more like 100 to 200 distinct areas, providing scientists with a far more accurate road map for studying the brain's different functions.

"We would like to have in the future a reference brain that shows true cellular resolution," says Amunts—about one or two micrometers, as opposed to 20. That's a daunting goal, for several reasons. One is computational: Evans says such a map of the brain might contain several

petabytes of data, which computers today can't easily navigate in real time, though he's optimistic that they will be able to in the future. Another problem is physical: a brain can be sliced only so thin.

Advances could come from new techniques that allow scientists to see the arrangement of cells and nerve fibers inside intact brain tissue at very high resolution. Amunts is developing one such technique, which uses polarized light to reconstruct three-dimensional structures of nerve fibers in brain tissue. And a technique called Clarity, developed in the lab of Karl Deisseroth, a neuroscientist and bioengineer at Stanford University, allows scientists to directly see the structures of neurons and circuitry in an intact brain. The brain, like any other tissue, is usually opaque because the fats in its cells block light. Clarity melts the lipids away, replacing them with a gel-like substance that leaves other structures intact and visible.

Though Clarity can be used on a whole mouse brain, the human brain is too big to be studied fully intact with the existing version of the technology. But Deisseroth says the technique can already be used on blocks of human brain tissue thousands of times larger than a thin brain section, making 3-D reconstruction easier and less error prone. And Evans says that while Clarity and polarized-light imaging currently give fantastic resolution to pieces of brain, "in the future we hope that this can be expanded to include a whole human brain."

CYBER LAW

Ms. N.SHANMUGAPRIYA

ASST. PROFESSOR IN COMPUTER SCIENCE

- Cyber law is the area of law that deals with the internet's relationship to technological and electronic elements, including computers, software, hardware and Information's Systems (IS).
- Cyber laws prevent or reduce large scale damage from cybercriminal activities by protecting information access, privacy, communications, intellectual property((IP) and freedom of speech related to the use of the internet , websites, email, computers, cell phones, software and hardware, such as data storage devices.
- The increase in Internet traffic has led to a higher proportion of legal issues worldwide. Because cyber laws vary by jurisdiction and country, enforcement is challenging, and restitution ranges from fines to imprisonment.

CYBER CRIME

- Cybercrime is defined as a crime in which a computer is the object of the crime (hacking, phishing, spamming) or is used as a tool to commit an offense (child pornography, hate crimes).

- Cybercriminals may use computer technology to access personal information, business trade secrets, or use the Internet for exploitive or malicious purposes.
- Criminals can also use computers for communication and document or data storage.
- Criminals who perform these illegal activities are often referred to as hackers.
- Cybercrime may also be referred to as computer crime.
- Cybercrime encompasses a wide range of activities, but these can generally be broken into two categories:
  - Crimes that target computer networks or devices. These types of crimes include viruses and denial-of-service (DoS) attacks.
  - Crimes that use computer networks to advance other criminal activities. These types of crimes include cyber stalking, phishing and fraud or identity theft.

FUTURE OF THE CELL PHONE TECHNOLOGY

Ms. R. VIDHYA

ASST. PROFESSOR IN COMPUTER APPLICATIONS

- If the current trend continues, what will be the future of the cell phone? What new paradigms will be shattered in the coming years? What new frontiers will technology conquer? While research is going

on under covers and strict secrecy, some trends are clearly emerging. Let us look at some of the likely areas of focus.

- The cell phones of the future are likely to have smarter, intelligent screens. Advanced touch-screens may give way to new devices that can understand voice commands or human gestures. The phone will become a personalized device, customized to its owner. This will enable swift reaction from the device in response to the needs and urges of the user.
- In the recent years, mobile devices are available in a variety of screen sizes. Apart from the pocket-size screens, we have notebooks, tablets and bigger screens available for all occasions. The cell phone of the future may combine all these devices into one and offer a flexible screen. The user may be able to expand or contract the phone screen on-demand. Thus, the phone can be expanded into a projector during a presentation, and then shrink back into a pocket-size device. It may also get molded into other shapes such as a wrist-watch.
- The cell phone is fast growing as an essential device carried by everyone. This has attracted the attention of the fashion industry. In the coming years, it will not be surprising if the cell phones are used as fashion accessories. Bracelets, necklace pendants and many such ornaments may have cell phones embedded in them.

BOSTON DYNAMICS (ROBOT INDUSTRY)

Ms. V. MENAKA

ASST. PROFESSOR IN COMPUTER SCIENCE

Boston Dynamics is an engineering and robotics design company that is best known for the development of BigDog, a quadruped robot designed for the U.S. military with funding from Defense Advanced Research Projects Agency (DARPA) and DI-Guy, software for realistic human simulation. Early in the company's history, it worked with the American Systems Corporation under a contract from the Naval Air Warfare Center Training Systems Division (NAWCTSD) to replace naval training videos for aircraft launch operations with interactive 3D computer simulations featuring DI-Guy characters. Marc is the company's president and project manager. He spun the company off from the Massachusetts Institute of Technology in 1992.

Products:

- **BigDog**

BigDog is a quadrupedal robot created in 2005 by Boston Dynamics, in conjunction with Foster-Miller, the Jet Propulsion Laboratory, and the Harvard University Concord Field Station It is funded by the DARPA in the hopes that it will be able to serve as a robotic pack mule to accompany soldiers in terrain too rough for vehicles. Instead of wheels, BigDog uses

four legs for movement, allowing it to move across surfaces that would defeat wheels. Called "the world's most ambitious legged robot", it is designed to carry 340 pounds (150 kg) alongside a soldier at 4 miles per hour (6.4 km/h; 1.8 m/s), traversing rough terrain at inclines up to 35 degrees.

- **Cheetah**

The Cheetah is a four-footed robot that gallops at 28 miles per hour (45 km/h; 13 m/s), which as of August 2012 is a land speed record for legged robots. The previous record was 13.1 miles per hour (21.1 km/h; 5.9 m/s), set in 1989 at MIT. Cheetah development is funded by DARPA's Maximum Mobility and Manipulation program. This robot has an articulated back that flexes back and forth on each step, thereby increasing its stride and running speed, much like the animal does. The original Cheetah robot runs on a high-speed treadmill in the laboratory where it is powered by an off-board hydraulic pump and uses a boom-like device to keep it running in the center of the treadmill. A free-running Cheetah that will operate more naturally in the field, named the WildCat, was unveiled to the public on October 3, 2013

- **LittleDog**

LittleDog is a small quadruped robot developed for DARPA by Boston Dynamics for research. Unlike BigDog, which is run by Boston

Dynamics, LittleDog is intended as a test bed for other institutions. Boston Dynamics maintains the robots for DARPA as a standard platform.

LittleDog has four legs, each powered by three electric motors. The legs have a large range of motion. The robot is strong enough for climbing and dynamic locomotion gaits. The onboard PC-level computer does sensing, actuator control and communications. LittleDog's sensors measure joint angles, motor currents, body orientation and foot/ground contact. Control programs access the robot through the Boston Dynamics Robot API. Onboard lithium polymer batteries allow for 30 minutes of continuous operation without recharging. Wireless communications and data logging support remote operation and data analysis. LittleDog development is funded by the DARPA Information Processing Technology Office.

RiSE

RiSE is a robot that climbs vertical terrain such as walls, trees and fences, using feet with micro-claws to climb on textured surfaces. It changes posture to conform to the curvature of the climbing surface and its tail helps it balance on steep ascents. RiSE is 0.25 m long, weighs 2 kg, and travels 0.3 m/s. Each of RiSE's six legs is powered by a pair of electric motors. An onboard computer controls leg motion, manages communications, and services a variety of sensors, including joint position sensors, leg strain sensors and foot contact sensors.

SandFlea

SandFlea is a small robot capable of jumping 30 feet (8 m) straight up. This wheeled robot weighs 11 pounds (4.9 kg), and drives like a remote-controlled car on flat surfaces. The robot uses gyro stabilization to stay level during flight, to provide a clear view from the onboard camera, and to ensure a smooth landing. Sand Flea can jump about 25 times on one charge. Boston Dynamics is developing Sand Flea with funding from the US Army's Rapid Equipping Force (REF). Earlier versions of Sand Flea were developed by Sandia National Laboratory with funding from DARPA and JIEDDO.

PETMAN

PETMAN (Protection Ensemble Test Mannequin) is a bipedal device constructed for testing chemical protection suits. It is the first anthropomorphic robot that moves dynamically like a real person. Much of its technology is derived from BigDog. Unlike previous suit testers that had a limited repertoire of motion and had to be supported mechanically, PETMAN balances itself and moves freely; walking, bending and doing a variety of suit-stressing calisthenics during exposure to chemical warfare agents. PETMAN also simulates human physiology within the protective suit by controlling temperature, humidity and sweating, all to provide realistic test conditions. The PETMAN system was delivered to the user's test facility where it is going through validation experiments. Boston Dynamics' partners for the program are MRIGlobal, Measurement

Technologies Northwest, Smith Carter CUH2A (SCC), SRD, and HHI Corporation.

LS3

Legged Squad Support System (LS3), also known as Alpha Dog, is a militarized version of BigDog. It is ruggedized for military use, with the ability to operate in hot, cold, wet, and dirty environments.LS3 is a rough-terrain robot designed to go anywhere Marines and Soldiers go on foot, helping carry their load. Each LS3 carries up to 400 lbs of gear and enough fuel for a 20-mile mission lasting 24 hours. LS3 automatically follows its leader using computer vision, so it does not need a dedicated driver. It also travels to designated locations using terrain sensing and GPS. LS3 began a 2-year field testing phase in 2012. LS3 is funded by DARPA and the US Marine Corps. Boston Dynamics has assembled an extraordinary team to develop the LS3, including engineers and scientists from Boston Dynamics, Carnegie Mellon, the Jet Propulsion Laboratory, Bell Helicopter, AAI Corporation and Woodward HRT.

Atlas

The Agile Anthropomorphic Robot "Atlas" is a 6-foot (1.8 m) bipedal humanoid robot, based on Boston Dynamics' earlier PETMAN humanoid robot, and designed for a variety of search and rescue tasks.

Atlas is a high mobility, humanoid robot designed to negotiate outdoor, rough terrain. Atlas can walk bipedally leaving the upper limbs

free to lift, carry, and manipulate the environment. In extremely challenging terrain, Atlas is strong and coordinated enough to climb using hands and feet, to pick its way through congested spaces. Articulated, sensate hands will enable Atlas to use tools designed for human use. Atlas includes 28 hydraulically-actuated degrees of freedom, two hands, arms, legs, feet and a torso. An articulated sensor head includes stereo cameras and a laser range finder. Atlas is powered from an off-board, electric power supply via a flexible tether.

- **RHex**

RHex is a six-legged robot with inherently high mobility. Powerful, independently controlled legs produce specialized gaits that devour rough terrain with minimal operator input. RHex climbs in rock fields, mud, sand, vegetation, railroad tracks, telephone poles and up slopes and stairways.

RHex has a sealed body, making it fully operational in wet weather, muddy and swampy conditions. RHex's remarkable terrain capabilities have been validated in government-run independent testing. RHex is controlled remotely from an operator control unit at distances up to 700 meters. Visible/IR cameras and illuminators provide front and rear views from the robot.

MAILING LIST – *To Whom We Send*

- **Mr.B.Murali, HOD of CS, PSG college of Arts and Science, Coimbatore- 14.**
- **Mr.P.Narendran, HOD of CS, Gobi Arts &Science College, Gobichettipalayam-53.**
- **Dr.M.Chandrasekharan, HOD of CS, Erode Arts College (Autonomous), Erode - 09.**
- **Mr.S.SureshBabu, HOD of CS, Thiruvalluvar Government Arts College, Rasipuram.**
- **Dr.K.Thangavel, HOD of CS, Periyar University, Salem-11.**
- **Prof S. Joseph Gabriel, HOD of CS, MazharulUloom College, Vellore – 02**
- **Dr.P.Venkatesan, Principal, Vysya College of Arts and Science, Salem-03,**
- **Dr.P.Swaminathan, Dean, School of Computing, SASTRA University, Kumbakonam.**
- **Dr.S.K.Jayanthi, HOD of CS, Vellalar College for Women, Erode-9**
- **Dr.S.Krishnamoorthy, Dean, Anna University, Trichy-24.**
- **Dr. K. Rama, Deputy Adviser, NAAC, Bangalore.**
- **Dr.HannahInbarani, Asst Prof, Dept of CS, Periyar University, Salem-11.**
- **Dr.R.Balasubramaniam, Prof& HOD of CS, Manonmaniam Sundaranar University, Tirunelveli.**
- **Dr.P.Jaganathan, Director, Dept of MCA, PSNA Engineering college, Dindugal-22.**
- **Dr.D.Venkatesan, SeniorAsst. Prof, Dept. of CS, School of Computing, SASTRA University, Tanjore-01.**

- **Dr.C.Muthu, Reader, Dept of Information Science and Statistics, St. Joseph College, Tiruchirapalli– 02.**
- **Dr. D.I. George Amalarethinam, Director, Department of MCA, Jamal Mohamed College, Tiruchirapalli – 20.**
- **Mr. B. Rajesh Kanna, Assistant Professor in Elect &Comm, Annamalai University, Chidambaram.**
- **Dr.H.FaheemAhmed, Asst Prof & HOD of CS, Islamiah College, Vaniyambadi – 02**
- **Dr. S. Leela, Controller of Examination, Periyar University, Salem-11.**
- **Dr. K. Angamuthu, The Registrar, Periyar University, Salem-11.**
- **Prof.Dr.C.Swaminathan, Vice Chancellor, Periyar University, Salem-11.**
- **Mr.Vaithiyanathan, Project Manager HCL Technologies, Chennai.**
- **Dr.T.Santhanam, Reader& HOD of CA, Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai –06.**
- **Dr.SheelaRamachandran, Vice Chancellor, Avinashilingam University, Coimbatore.**
- **Dr.R.Rajesh, Asst. Prof, Dept of CS & Engineering, Bharathiyar University, Coimbatore - 46**
- **Dr.R.S.Rajesh, Reader, Computer Science and Engineering, Manonmaniam Sundaranar University, Tirunelveli-12.**
- **Dr.L.Arockiam, Associate Professor, Dept of CS, St. Joseph College, Tiruchirapalli-620002**
- **Mr.V.Saravanan, Associate Professor, Dept of CA, Hindustan College of Arts and Science, Coimbatore – 28.**
- **Dr.R.Ravichandran, Secretary, Dept of CS, KGISL Institute of Technology, Coimbatore-35.**
- **Dr. N.Sairam, Associate Dean, School of Computing, Sastra University, Tanjore – 01**

- **Dr.T.Senthikumar, Asst Prof, Amrita Institute of Technology, Coimbatore - 12**
- **Mr.S.T.Rajan, Sr. Lectr, Dept of CS, St. Josephs College, Trichy-02.**
- **Dr.R.AmalRaj, Prof. Dept Of CS, SriVasavi College, Erode – 16.**

Alphabet taught to kids nowadays


A: APPLE


B: BLUETOOTH


C: CHAT:


D: DOWNLOAD

E: E MAIL


F: FACEBOOK

G: GOOGLE

H: HEWLETT PACKARD


I: Iphone


J: JAVA


K: KINGSTON


L: LAPTOP


M: MESSENGER


N: NERO

O: ORKUT


P; PICASSA


Q: QUICK HEAL


R: RAM


S: SERVER

T: TWITTER


U: USB


V: VISTA


W: WiFi

X: Xp

Y: YOU TUBE

Z: ZORPIA

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Tiruchengode-637215.

Phone:04288-274741(4),

Mail : ishare@ksrcas.edu