

CYBERBLITZ



RSET
RAJAGIRI SCHOOL OF
ENGINEERING & TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
RAJAGIRI SCHOOL OF ENGINEERING & TECHNOLOGY
RAJAGIRI VALLEY, KAKKANAD, KOCHI, 682039, KERALA, INDIA

CONTENTS

FROM HOD'S DESK.....	3
FACULTY CORNER.	
GENES, GENETICS AND GENIUS.....	4
SIMPLE PYTHON SCRIPT FOR EXTRACTING EMAIL ADDRESSES FROM A WEBPAGE.....	5
RASBERRY.PI-3.....	7
IMAGE QUALITY ASSESSMENT.....	8
STUDENT CORNER.	
IS TECHNOLOGY BOON OR BANE?.....	9
IOT IN HEALTH CARE.....	10
SOLID WASTE DISPOSAL IN URBAN SCENARIOS.....	11
GCA:GLOBAL CONGESTION AWARENESS FOR LOAD BALANCE IN NETWORKS-ON-CHIP.....	12
AUGMENTED REALITY (AR).....	13
SNAPDRAGON 820 PROCESSOR.....	14

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

Engineers are the people who give creative and practical solutions for problems faced by the world. They are the people who change the world. As an engineering student your objective should be to become successful in your career. There is no single algorithm that you can follow to achieve success. But there are certain factors that will definitely lead you to success. The first and foremost among them is to identify your goals. You can't expect to be somewhere if you don't know where you want to reach. Imagine how you would like to see yourself after 20 years. Let that imagination fill your dreams. Once your goal is set, next step is to strengthen your commitment towards the goal. Change your behaviors and attitudes. Be enthusiastic and develop positive attitude and confidence and finally success will be yours.

To succeed in the career as a computer engineer you should have a love for technology. Technology is growing at an explosive rate. Always be updated with the latest technological developments. Books, online tutorials, magazines and journals will help you to get updated with the developments in technology. Apart from these, peer group discussions are the strongest means for sharing and sharpening your technological skills. This year the department has launched a couple of clubs to stimulate the technological interests of students. We have launched a Talent club and a Micro project cell. Talent club is a venue for the students to exhibit their excellent technical profiles. Micro project cell gives the students the opportunity to take up and execute challenging projects. Come forward, take up these opportunities and nurture the technically strong and vibrant engineer in you.

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



Ajith.S
Asst. Professor
DCS, RSET

GENES, GENETICS AND GENIUS

Genius, as they say is lot of perspiration and a bit of inspiration. Now, the question is, the inspiration part, is it wholly acquired through the life time of a person or has it something to do with the genes and genetics of the person?

Be the answer, affirmative or not, the proofs are difficult to come by. But, supporting, corroborating and collective correlating facts are not so difficult to find.

Certain information should have been encoded in our memory, even before we are born. Say for example, the baby knows that it has to suckle its mother for its existence, by instinct. All mammals do. 'Arctic Tern', the bird that has the longest flight path for its migratory track, lays its eggs on tropics and flies back before the young ones start flying, and yet the little ones, when they mature, flies to Polar regions, without fail, when the season is ripe for that. Is that just instinct?

Sir Bertrand Russel, a renowned Mathematician and Philosopher, had six generations of ancestors in line, who were exceptionally bright in Mathematics. We really have a Nobel Prize family, that of Madam Curies'. Lala Amarnath and his son Mohinder Amarnath were legendary cricketers of Indian Team. Both played similar strokes. Are they all just some random cases, or just strange coincidence? I wonder whether there is something more than that.

But, studies reveal that, not all genetic traits are active in one's life time. Around fifty thousand genomes are identified as human, of which, around twenty five thousand are believed to be of charecterics of intelligence and acquired skills. But whether a particular one in your life time is active or not is not very clear, neither is predictable. That is, we are not sure, what or which factor, do fire that genome to make it active or would make it remain dormant. That discovery might make a phenomenal change in science and in our life and might revolutionize the future world.

The man can acquire intelligence through his life time of experience, can use it and perfect it. Artificial Neural systems can learn though experience, though at a considerably slow pace. If we ever discover to fire away a particular set of genomes for certain acquired intelligence through generations and is able to facilitate the same in the cyber space, at least nominally, it could be a big break through.

This could be a wild dream. But some of the wild dreams have come true through time. Flying was once just a dream, but we know it is now a reality. Who knows, this could also.....



Jayarajan J N
Asst. Professor
DCS, RSET

Simple python script for extracting email addresses from a webpage

One reason that makes python one of the 'must-learn' programming language is its usability in solving day to day problems or making those problems simple to solve. For example, suppose you need to send emails to some people. Profile of these people may be listed in a webpage which contains their email id along with lot of other details. You will have to copy the email ids from that page and send emails to them. But if the number of email id to be extracted is of the order of 100, it will be a time consuming and monotonous task. To make the task even more complicated, some websites wont allow us to manually copy the content from it.

Now let us see how we can extract the email ids from a given web page with a simple python script

Step 1: We need to extract the webpage, We do it using 'requests' library. It can be installed by following command

```
$ sudo pip install requests
```

To we open the page as follows

```
response = requests.get( the_url )
```

response represent response from the requested url. response.text contains html code for the webpage.

Setp 2: Now we need to extract the email ids from html content. We can do it by using regular expression, as follows

```
email_extractor = re.compile(r'[A-Za-z0-9._%+-]+@[A-Za-z0-9.-]+\.[a-zA-Z]{2,4}')
```

```
emails = email_extractor.findall(response.text)
```

emails is a list of email addresses extracted from the webpage.

Step 3: Write these email ids into a file and save it.

```
with open("emails.txt", 'a+') as fp:
```

```
fp.write(', '.join(emails) )
```

Thats it. We can extract hunderds of email ids from hundreds of pages like this in no time. The complete code is given bellow and feel free to use it as you wish.

```
#!/usr/bin/env python  
"""
```


Script for extracting email addresses from a given web page
to get usage details try

```
python emails.py -h
```

```
"""
__authors__ = ["Jayarajan J N"]

q
import re
import requests
import argparse
import os.path

if __name__ == '__main__':

    parser = argparse.ArgumentParser()
    parser.add_argument("url", help = 'url of page you wish to look for email ids')
    arguments = parser.parse_args()

    # Let's get the web page
    response = requests.get(arguments.url)
    if response.ok:

        # a simplified regular expression for email addresses.
        email_extractor = re.compile(r'[A-Za-z0-9._%+-]+@[A-Za-z0-9.-]+\.[a-zA-Z]{2,4}')

        # find all strings matching the regular expression from web page.
        emails = email_extractor.findall(response.text)

        filename = 'emails.txt'

        # write the email ids in to a text file.
        with open(filename, 'a+') as fp:
            fp.write(', '.join(emails) )
            print "Completed extraction!"
        else:
            print "%d : Something happened, Check your url" % (response.status_code)
```




Jisha Mary Jose
Asst. Professor
DCS, RSET

RASBERRY PI-3

The Raspberry Pi is a series of credit card-sized single-board computers developed in England, United Kingdom by the Raspberry Pi Foundation with the intent to promote the teaching of basic computer science in schools and developing countries.



On 29 February 2016, the latest version of Raspberry Pi-version 3 was released and is now on sale for US\$35 (the same price as the existing Raspberry Pi 2). Pi 3 adds the following new features to the existing ones: It has a 64 bit processor. A 1.2 GHz quad-core ARM Cortex-A53 CPU (~10× the performance of Raspberry Pi 1 and compared with Pi 2 which is ~6× performance of Raspberry Pi 1) based on ARM's latest ARMv8-A architecture (which is compatible with older). It also has integrated 802.11n wireless LAN and Bluetooth 4.1 features. The new product is completely compatible with Raspberry Pi 1 and 2.

Raspberry Pi 3 has a new BCM2837 System-on-Chip (SoC) retaining compatibility with the GPU, CPU and connectors of its predecessors BCM2835 (Pi 1) and BCM2836 (Pi 2), so all the projects and tutorials for Pi 1 and Pi 2 hardware will be supported on Pi 3. The 900 MHz 32-bit quad-core ARM Cortex-A7 CPU complex has been replaced by a 1.2 GHz 64-bit quad-core ARM Cortex-A53. Combining a 33% increase in clock speed with various architectural enhancements, this provides a 50-60% increase in performance in 32-bit mode versus Raspberry Pi 2, or roughly a factor of ten over the original Pi 1. So in all terms the new Pi-3 comes with a lot of new advanced features which opens up the scope for more detailed study in this field.





Jincy J Fernandez
Asst. Professor
DCS, RSET

Image Quality Assessment

Digital images have become an important part in many applications and its impact has been witnessed in the early phase of 21st century. Digital images are subjected to a wide variety of distortions, during acquisition, processing, compression, storage, transmission and reconstruction, which may degrade the visual quality of the image. Image quality can be specified as any characteristic of an image that is used to measure the perceived image degradation and the main factors that could affect the quality are sharpness, noise and contrast. So accessing the quality is a major issue in image processing applications.



“Lena” image is distorted by different means. (a) Original Image; (b) Gaussian noise contaminated image; (c) Blurred Image; (d) JPEG compressed image; (e) Contrast stretched image; (f) Salt and Pepper noise contaminated image.

Image quality assessment methods or metrics can be classified into subjective and objective methods. In Subjective evaluation, a group of human experts are assigned to evaluate a set of images and determine the quality of the images in the scale of 1 to 5.

The correct method of quantifying visual image quality is through subjective evaluation as the ultimate viewers are human beings. For example, the presence of blur in an image can be easily identified by the human eye but it is difficult for the computer. But practically, the subjective method is inconvenient, slow and expensive. Objective method develops quantitative measures that can automatically predict perceived image quality. According to the availability of a reference (distortion free) image, objective image quality metrics can be classified into Full Reference (FR), No Reference (NR) and Reduced Reference (RR). In FR, the quality of an image is compared with a reference image which is assumed to be of perfect quality. In RR, the reference image is only partially available, for e.g. in the form of a set of extracted features. In NR, the reference image is not available, and machine learning techniques are used to model human perception.

Various image quality assessment metrics are available for different types of images like Natural images, Medical images and Satellite images. For e.g. MSE (Mean Squared Error), PSNR (Peak Signal to Noise Ratio), SSIM (Structural Similarity Index). The choice of metric is dependent on the area of application. No metric is found to have equal performance for all applications.

Thats all Folks!!!

STUDENT CORNER



Bhagyabhanu M P
S8 CS A

IS TECHNOLOGY BOON OR BANE?

Technology!! Technology!! Technology!!. Everywhere we see technology. The mobiles we use. The vehicles we travel. Even the food we eat uses some kind of technology. Everywhere it's overflowing with the essence of technology. But are we safe here? It's a matter to think about. In Cyberspace, a number of negative incidents are arising that are even hard to believe. It's hard to admit the fact that we are living in this unreal world.

Even though technology is beneficial in many aspects to all of us, negativity of it also increases at an equal pace. So it's high time we safeguard ourselves from this. Smart phones help us with wonderful apps that give us an opportunity to entertain ourselves and boost up with high energy from the hectic mundane life. 'WhatsApp' and 'FaceBook' keeps friends closer but diminishes the communication bond within the family.

There are a lot of people who strive to move the wheels of life. Some of them are even born handicapped. It is nearly impossible to bring those people back to being normal beings. But it is possible to help them lead a better life by taking all the benefits of technologies available today. So technology can indeed be a boon as well as a bane.



It's high time to move out of the adverse effects of the 'tech world' and instead use it for the well being of human race.

Let us be a little more conscious about the things that are happening around the world. Let us not fall in the deep pits of technology.



Jane Thomson
S8 CS A

IoT IN HEALTH-CARE

In the current technology enabled world, changes are rapid and the development of new technologies takes place at a very fast rate. Internet of Things (IoT) is one such development happening right now, which has the potential to change the way healthcare is delivered. Internet of Things (IoT) is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment. The IoT allows people and things to be connected anytime, anyplace, with anything and anyone, ideally using any path/network and any service. The main contributor for the IoT can be attributed to the growth of smart phones and tablets. Medical care and health care represent one of the most attractive application areas for the IoT.

The IoT has the potential to give rise to many medical applications such as remote health monitoring, fitness programs, chronic diseases, and elderly care. Health is the fundamental capability humans require to perceive, feel, and act effectively, and as such, it represents a primary element in the development of the individual, but also of the environment humans belongs to. That is why it is necessary to provide adequate ways and means to ensure the appropriate healthcare delivery based on parameters monitoring and direct providing of the medical assistance. With the appearance of the Internet of Things, elements such as sensors and sensor networks are becoming available and applicable in all fields of human activity, thus providing conditions for the creation of expert systems that can operate anytime and anywhere.



The following are some of the services and applications offered by IoT.

- AMBIENT ASSISTED LIVING (AAL): An IoT platform powered by artificial intelligence that can address the health care of aging and incapacitated individuals is called ambient assisted living (AAL). The purpose of AAL is to extend the independent life of elderly individuals in their place of living in a convenient and safe manner.
- GLUCOSE LEVEL SENSING: Sensors attached to patients are linked through IPv6 connectivity to relevant healthcare providers. A transmission device based on IoT networks is used for the transmission of collected data on blood glucose to the health center. This device includes a blood glucose collector, a mobile phone or a computer, and a background processor.
- ELECTROCARDIOGRAM MONITORING: The monitoring of the electrocardiogram (ECG), that is, the electrical activity of the heart recorded by electrocardiography. It includes the measurement of the simple heart rate and the determination of the basic rhythm as well as the diagnosis of multifaceted arrhythmias, myocardial ischemia etc. The system integrates a search automation method to detect abnormal data such that cardiac function can be identified on a real-time basis.



Sidharth Surendran
S8 CS B



Robin G Tharayil
S8 CS B



Vishnu M Vinish
S8 CS B

SOLID WASTE DISPOSAL IN URBAN SCENARIOS

As a developing nation and as the second most populous country in the world we in India face unique problems that require unique solutions. One such problem is that of waste management. As of now there are traditional waste management systems like periodic and routine clearing by the various civic bodies like the municipal corporation. But even though these routine maintenances are carried out we often come across overflowing garbage bins from which the garbage spills on to the streets. This happens because; as of now there is no system in place that can monitor the garbage bins and indicate the same to the corporation.

So there is a need of a self-sustaining maintenance free system that uses a combination of hardware and software to track the garbage management. These networks can work even with very low power. Thus different garbage bins in different locations within the city form a dynamic multichip network that can provide the information to any local corporation office and at the same time to the head office as well. Hence if the local bodies are not performing the maintenance properly the head office will know the information almost instantaneously. Hence it can also act as an automatic double check on the part of the government authorities as well.

Each garbage bin is fitted with a GSM for communication, an ultrasonic sensor for monitoring the level of garbage in the bin. The static locations of bins are found first and each bin is uniquely identified by the number from which the message is sent from bin. The Android phone uses an app which checks the message notifications and finally provides an optimized path to collect all bins. So this system aims to contribute to the overall cleanliness of our society in the near future.



Neenu George
S8 CS B



Sheena K Joseph
S8 CS B



TreesaAnto C
S8 CS B

GCA: Global Congestion Awareness for Load Balance in Networks-on-Chip

Network on Chip (NoC) is a new paradigm to make the interconnections inside a System on Chip (SoC) system. In traditional solutions interconnections are realized using a bus structure. While integration increases the bus structure does not meet the needs of the new technology. Bus starts to be narrow and in the worst case it begins to block traffic. In NoC technology the bus structure is replaced with a network which is a lot similar to the Internet. Segments communicate with each other by sending packetized data over this network

Even though NoC's provide high bandwidth current routing algorithms such as dimension ordered routing causes poor load balance and thus results in latency and poor performance. To overcome poor load balance adaptive routing algorithms was introduced which performs routing based on local or regionally available information. Local adaptive routing will make the route decisions based on the locally available congestion information. It takes greedy decisions as it does not have the complete view of congestion in the entire network. Thus it may route the packet in the heavily congested route. Global Congestion Awareness (GCA) proposes a globally-aware routing technique that effectively reacts to the changing network conditions. The global congestion awareness gives the complete visibility of the network and thus will not take greedy decisions as in local adaptive routing.

GCA (Global Congestion Awareness)

Global congestion awareness is an adaptive routing scheme for NoCs. This method identifies the congestion status of the whole network and then decides which route is to be chosen. Each node has the congestion information of all the links in the network. The main difference of this scheme is the way information is transmitted across the network. The congestion information is transmitted along with the header flit which reduces the overhead of maintaining a secondary network as in the other methods. This is a globally aware algorithm so it takes into account a number of possible paths and then selects the one having the least congestion

GCA is a lightweight, low complexity adaptive routing algorithm, which makes per-hop routing decisions based upon awareness of the congestion of links throughout the network. It differs from other routing schemes in that it utilizes the existent packets within the network to convey congestion information instead of requiring a sideband network dedicated to congestion status propagation. This makes it a more scalable solution than other existing techniques.



Rejin Roy
S6 CS B

AUGMENTED REALITY (AR)

Video games have been entertaining us for nearly 30 years, ever since Pong was introduced to arcades in the early 1970s. Computer graphics have become much more sophisticated since then, and game graphics are pushing the barriers of photorealism. Now, researchers and engineers are pulling graphics out of our television screen or computer display and integrating them into real-world environments. This new technology, called augmented reality, blurs the line between what's real and what's computer-generated by enhancing what we see, hear, feel and smell.



Augmented reality (AR) is a live, direct or indirect, view of a physical, real-world environment whose elements are augmented by computer-generated sensory input such as sound, video, graphics or GPS data. It is related to a more general concept called mediated reality, in which a view of reality is modified (possibly even diminished rather than augmented), by a computer. As a result, the technology functions by enhancing one's current perception of reality.

By contrast, virtual reality replaces the real world with a simulated one. Augmentation is conventionally in real-time and in semantic context with environmental elements, such as sports scores on TV during a match. With the help of advanced AR technology (e.g. adding computer vision and object recognition) the information about the surrounding real world of the user becomes interactive.



Artificial information about the environment and its objects can be overlaid on the real world.

On the spectrum between virtual reality, which creates immersive, computer-generated environments, and the real world, augmented reality is closer to the real world. Augmented reality adds graphics, sounds, haptic feedback and smell to the natural world as it exists. Both video games and cell phones are driving the development of augmented reality. Everyone from tourists, to soldiers, to someone looking for the closest subway stop can now benefit from the ability to place computer-generated graphics in their field of vision.



Ashley George
S4 CS A

Snapdragon 820 Processor

As one of the most cutting-edge mobile processors ever created, the Qualcomm® Snapdragon™ 820 processor with X12 LTE supports the ultimate in connectivity, graphics, photography, power and battery efficiency. It is a chip built from the ground up and nearly everything in it has changed. The CPU cores, the GPU, the DSP, the modem, the image processors all have been upgraded from Snapdragon 810. Some of the core features of this new processor are:

X12 LTE

X12 LTE offers 3x faster peak upload speeds and 33% faster peak download speeds compared to those of X10 LTE.

Kryo CPU and Hexagon 680 DSP

The new Qualcomm® Kryo™ CPU has 2x performance and efficiency when compared to the CPU of Snapdragon 810. The new Qualcomm® Hexagon™ 680 DSP also brings significant improvement to performance and battery life.

Adreno 530 GPU

The Qualcomm® Adreno™ 530 GPU offers 40% improvement to graphics performance, compute capabilities, and power usage when compared to Adreno 430.

Advanced Wi-Fi

The Snapdragon 820 processor fundamentally changes the way Wi-Fi works with your phone by supporting both 802.11ad and 802.11ac 2x2 MU-MIMO which allows Wi-Fi to be up to 2x or 3x faster than 802.11ac without MU-MIMO

Less Time Charging

With Qualcomm® Quick Charge™ 3.0, users can spend less time charging and more time doing. It is the fastest and most efficient charging technology yet, Quick Charge 3.0 is 4x faster than conventional charging and 38% more efficient than Quick Charge 2.0.

Immersive Visual Graphics

The Adreno 530 in the Snapdragon 820 processor along with the Kryo CPU are capable of generating photorealistic graphics for console-quality gaming and next-generation virtual reality apps, while delivering up to 40% improvement to graphics performance and compute capabilities when compared to the Adreno 430.

Advanced Spectra Camera ISP

The Snapdragon 820 redefines today's camera capabilities. Supported by the latest 14-bit image sensors, hybrid autofocus and multi-sensor fusion algorithms, the Spectra camera ISP captures a wider range of colours and supports computational photography. Plus, the Snapdragon 820 also has Hexagon 680 with HVX (Hexagon Vector extensions), which supports advanced imaging and computer vision.

CONGRATULATION TOPPERS!!!

S8



A

Ann Maria Jerard

S6



B

Johnny Jose

S4



B

Vineetha Viswanath



ON DESK

COORDINATORS

DIYA THOMAS

JISHA MARY JOSE

EDITORIAL BOARD

AMITHA MATHEW

JAYARAJAN J N

JISHA MARY JOSE

DINCY PAUL

JOMINA JOHN