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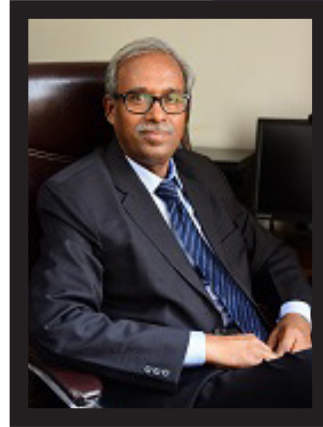
"Be Interested, Committed and Repeated"

Dear Readers,

          I feel delighted to see the dynamics of faculty and students of computer engineering department for giving a new level to TECH-NEXT. This technical magazine will be the source of motivation for faculty and students to remain interested and committed for the growth of the department and the institute. I would like to congratulate the editorial team for their effort in this regard. I wish all the best to the entire team for the future.

          -Dr. Arun Kumar

Dear reader,

It gives me immense pleasure to announce the publication of Volume 5, Issue 1 of our Technical Magazine 'TECH-NEXT': A Biannual Technology Review Magazine'. In the computer Engineering Department, VIVA Institute of technology we have always strived to provide quality and relevant education to the students. For the same reason we have undertaken and new technologies for students and faculties. Short Term Training Programmes are also arranged for educators on new technologies and on research topics. We at the department successfully conducted training programmes on "Cloud Computing", "Machine Learning and Natural Language Processing" and a certification course on "Ethical Hacking and IT Security".

The department has taken initiatives where the students are able to present seminars or conduct workshops on any new technologies that they might have learnt. Keeping in line with this and to encourage the students and faculties alike it was decided to launch the TECH-NEXT magazine in the year 2016. The magazine provides a platform for the students, faculties and technical minded people to share ,express and present their views and reviews on the current trends in technology.

I would like to express my gratitude towards our principal sir Dr. Arun Kumar and Dr. Narendra Shekoka, Professor and Head of Computer Engineering Department at Dwarkadas J. Sanghvi College of Engineering for guidance that they have rendered to us.

The main idea behind the magazine was to provide the students a platform to express their knowledge on technology. In line with this we decided to go for securing the Internal Standard Serial Number for our magazine and it gives me great pleasure to announce that we have been successful in our endeavour. Our technical magazine was granted ISSN (Online), ISSN (Online):24565105, by the government. I'm sure that this will prove to be very beneficial for the students and gives credibility to the articles published in the magazine.

-Prof. Ashwini Save
HOD,Computer Engineering Department

Editor's Desk

Dear reader,

We at computer engineering department, VIVA Institute of technology started the technical magazine 'TECH-NEXT: A Biannual Technology Review Magazine' with the rational that we need to and we should be focusing on the next generation technologies which are becoming or which will become an integrated part of our life. And, hence it is our responsibility as technical professionals that we need to understand the impact of these new technologies on our lives and make the readers aware of the same. In line with this, this is the 1st issue of the 5th volume of our Technical Magazine 'TECH-NEXT: A Biannual Technology Review Magazine'.

The first issue of the first volume of the Technical magazine predominantly contained articles written by faculty or our department. And, During the launching of our magazine it was suggested to us that we should have more articles from the students. I'm very happy to share with you that from then on more than 95% of the articles published have been contributed by students. The response from students was so overwhelming that we on the editorial board were able to select only one out of the three articles that were submitted.

We have also achieved a major milestone by securing International Standard Serial Number (Online), ISSN (Online):2456-5105. We believe that, with this the articles published in our Technical Magazine will garner reputation and will be beneficial for the contributors for their personal and professional growth.

Contributors for the next issue of the Technical Magazin will have to send their articles to "tech-next@viva-technology.org". And, we hope to publish the forth coming soon thereafter as well. Until then happy reading and keep spreading awareness of technology.

-Dr. Tatwadarshi P.N.
Chief-Editor,
TECH-NEXT: A Biannual Technology Review Magazine

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CSI VIVA-Tech 2019-20

PRASHANT SINGH
Publication Team
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ENGINEERING

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The Next in ML "AutoML"

-Hitesh Sutar   -Raj Vyas   -Kirti Joshi

INTRODUCTION :

AI and ML together play the foremost important role in creating more precise and audience-centric business choices. during this regard, AutoML will play a huge role in an attempt to form ML more accessible also to scale back human expertise required, and to enhance model performance. In recent time, AutoML is emerging as a new area for many fields such as research and development and business applications. It basically refers to the automated ML which may help developers to address difficult situations or scenarios with ready-to-use and adaptive solutions. All the extra steps that happen in between are often easily automated while delivering a model that's optimized well and prepared to form predictions. AutoML, which uses ML to get better ML models, is advertised as affording opportunities to "democratize machine learning" by allowing firms with less data science knowledge to develop difficult or higher level models to decipher complec business problems.

Previous Generation Technologies:

For years, AutoML was only used for tabular data, but now it's been improved for creating models that affect text datasets

also as datasets containing images. Such improvements have led to a rise within the adoption of AutoML solutions among AI-driven organisations. Today, firms are aggressively embracing automation in ML for transforming their workflows to deal with customer demands. For ML, AI skills were must and therefore the gap of not knowing anything about it used to cause hindrance in newer technology adoption. Thus, firms have deviated towards implementing AutoML solutions as a workaround to the shortage of relevant talents within the landscape.

New Technology Details:

As the enterprise IT sector is increasingly getting on its feet to supply AutoML as a stand-alone service, we now have several AutoML services from the world's leading tech companies. a number of the foremost promising AutoML services from foremost tech companies include Google Cloud AutoML, Microsoft Custom Vision, and therefore the Image Recognition solution from Clarifi.Google Cloud AutoML

- AutoML Natural Language — handling things like domain specific sentiment analysis and more
- AutoML Vision Object Detection — bounding box smart multi-object detection, basically Google Vision API on steroids
- AutoML Vision Edge — the IOT version of Vision detection for Edge Devices
- AutoML Video — Video media tagging.

Usefulness and Disadvantages:

Data scientists and non-experts of this field and are able to find solutions to the ML problems using AutoML due to an increase in the availability of various open-source and paid tools. These solutions can only handle specific tasks so that is still a challenge in here.
AutoML is not adequate to be a good data scientist but the software itself is a good illustration of how, in the near future, complex tasks like machine learning can become accessible to the broad population without years of training in the field of AI.

Limitation and Disadvangates:

There was a contest called Kaggle days where competitors got data from an auto parts maker and therefore the task was to predict bad batches in factory output, where a trio of AI experts from Google had used AutoML software which uses machine learning to get better machine learning, this resulted in, them winning the competition on second place.
Such instances reveal the potential of AutoML solutions within the current landscape. In fact, it affirms that we'd like data scientists to leverage the tool to form the foremost out of the input file . Thus, AutoML can't be the proper solution for addressing talents gap. AutoML won't be always compatible with different datasets since the info comes from dissimilar sources and are in several formats. Thus, capabilities of users become limited.

CONCLUSIONS & FUTURE SCOPE

Even with narrow used cases, AutoML is automating AI to help firms in achieving their objectives. The quality of AutoML has to be increased further for different Machine Learning activities. Even after being in its initial stage it still has the capability to manage the full ML workflow. Undoubtedly, it's allowing anyone with limited data science knowledge to deploy ML models and solve difficult business problems. But AutoML's incapability to handle a decent range of ML practices causes hindrance as non-experts can only perform limited ML tasks.

Qualcomm Snapdragon 865

-Shrutika Devdas Kudalkar   -Grishma Sunil Yadav

Introduction:

In the recent years the explosive growth of the portable small electronic devices is forcing the designers to optimize the present design for better performance in terms of smaller silicon area, higher speeds, longer battery life, and high reliability. Qualcomm's Snapdragon processor are established in millions of tablets and Android smartphones obligations to the fact that Qualcomm designs chips for budget, mid-range, and premium mobile devices. Every December, Qualcomm hosts an event where they reveal their latest high-end mobile platforms. Pantomath are going to get two new SoCs to show off: Qualcomm Snapdragon 765 and the Qualcomm Snapdragon 865. This is nothing but a successor to the most likely to be used in 2019 flagship phones that is Qualcomm Snapdragon 855 while this new processor gives the new boost up in the features like CPU, DSP, ISP, and modem.

CPU:

This latest processor offers 25% faster raw CPU performance over its precessor or 25% better CPU power efficiency at the same performance point. Question here arise that how to gain this uplift. And answer the company conclude is that: 1] Due to the addition of newer ARM cores. 2] The QS 865 features the same CPU core configuration as the QS 855, but the one Prime core and three Performance cores are now derived from the ARM Cortex-A77 design instead of Cortex-A76.

GPU:

Here comparison lies between Adreno640 and Adreno 650.But obvious this latest Adreno 650 comes with 20%faster graphics rendering 35 percent greater power efficiency. Qualcomm highlights that the new Adreno 650 allows for better sustained performance, meaning it'll take longer before your games start dropping frames. The Adreno GPU has long outperformed ARM's Mali GPU.

Cortex-A77: Benchmark uplift from Cortex-A76
Significant single-thread performance improvements

Estimated performance based on SPEC*int2006

Cortex-A75	Cortex-A76 +35%	Cortex-A77 +20%
10nm, 2.8GHz	7nm, 3GHz	7nm, 3GHz
2017	2018	2019
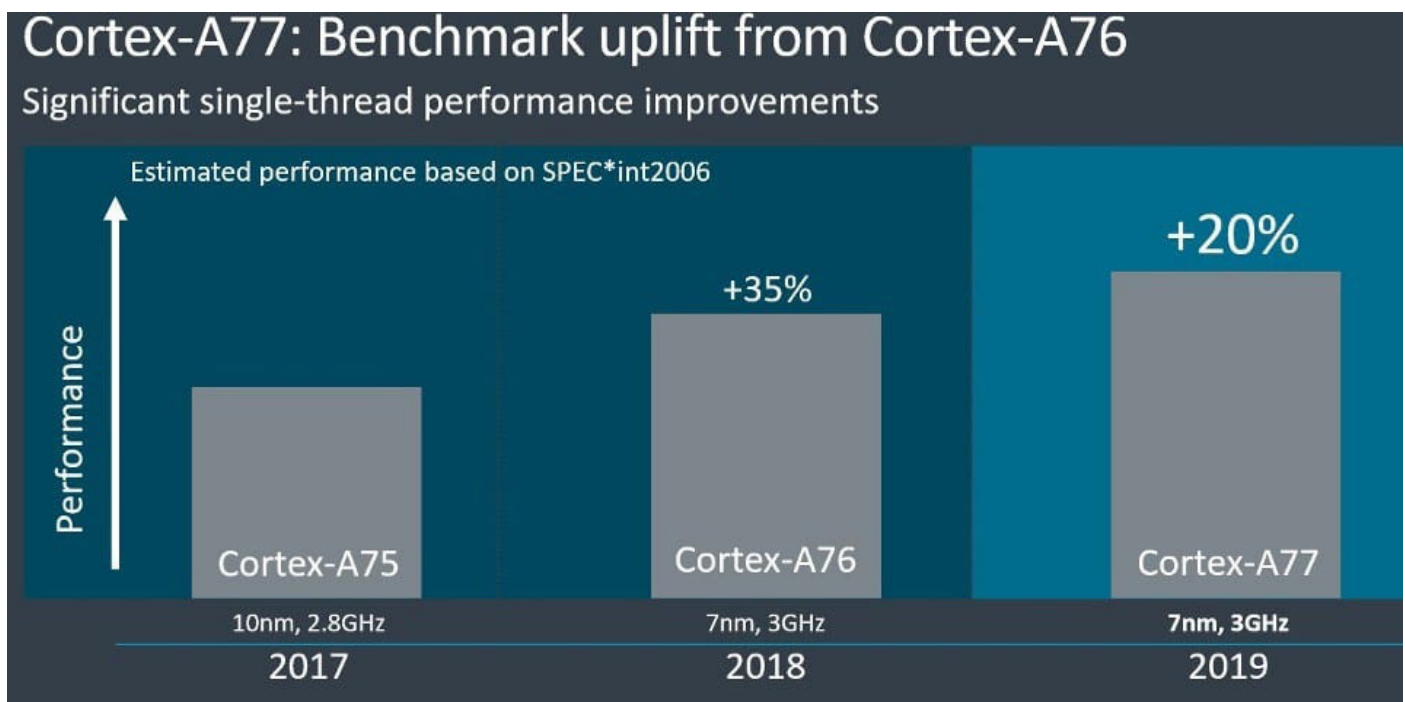
Display:

High refresh rate is something in high demand in today's gaming world .As some of the best sold flagship phones like Rog phone II and Aquos R3 had given a smoother display. Working on high resolution display increases strain on the GPU, but this processor is capable of pushing QHD resolution at 144Hz.

AI:

Something that links closely into camera is Artificial Intelligent. General idea of this is to make your life easier without you needed to think about what is happening in background .Everything is you to do have a proper posture and AI is going to do the work of smoothing , sharping, bookie ,etc while capturing the photos and real time capturing of photos while video rendering.
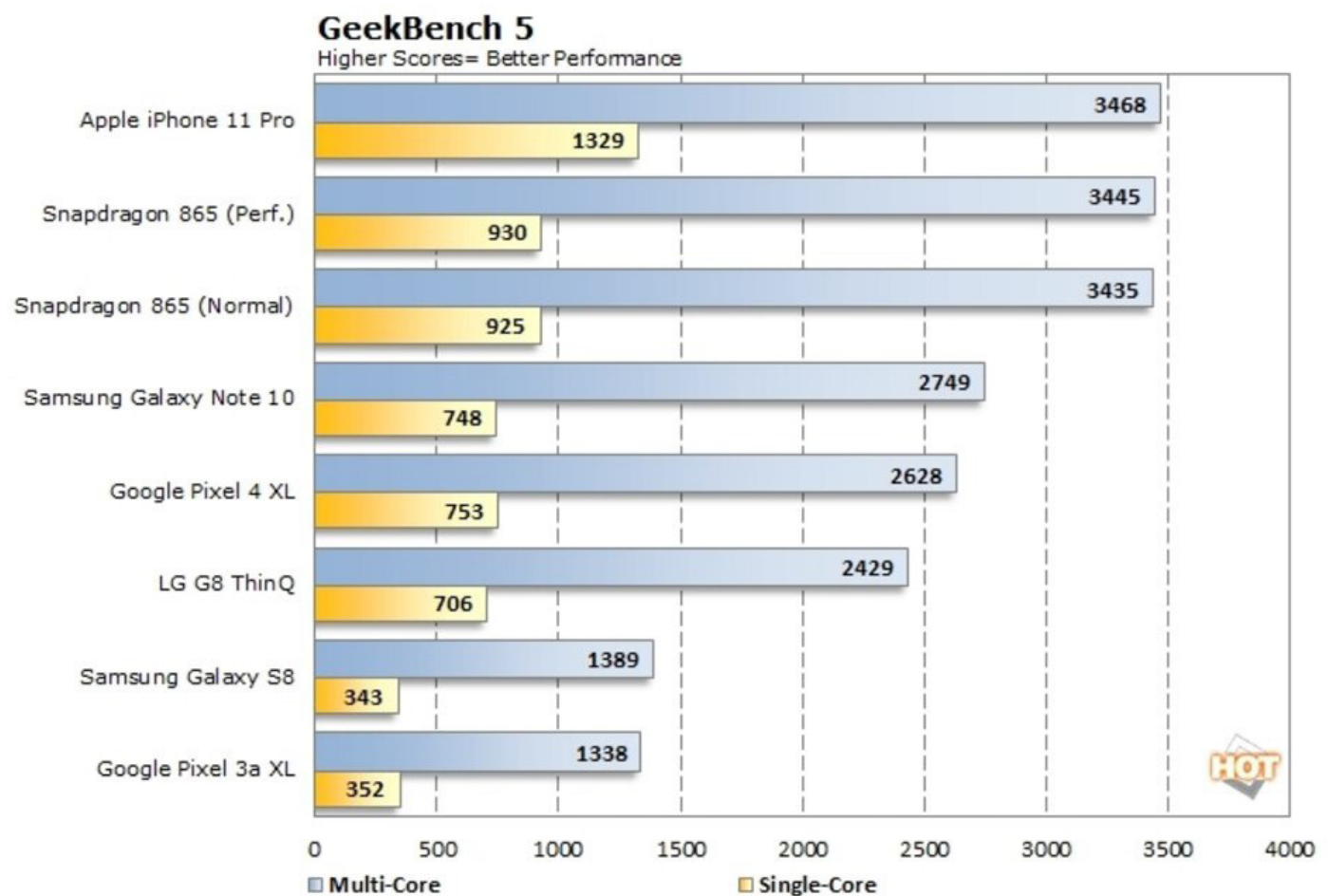
Memory:

Snapdragon 865 provisions LPDDR5 memory up to 2750MHz, LPDDR5 is the newest feature that implements feature dual differential clock system for growing the frequency. And for the better power consumption new deep sleep mode and Link ECC to recover data from failed R/W operations.

Charging:

Qualcomm has latest fast charging technology, unfortunately it's not made its way to the Snapdragon 865. The Qualcomm's Fast Charge 4+ is also available it for up to 27W of fast wired charging. Although the charging speed will not be getting a bump the battery long life might be. The new Quick Charge AI guarantees the extension of battery life cycles so we can keep using our device for longer time.

GeekBench 5
Higher Scores= Better Performance

Device	Single-Core	Multi-Core
Apple iPhone 11 Pro	1329	3468
Snapdragon 865 (Perf.)	930	3445
Snapdragon 865 (Normal)	925	3435
Samsung Galaxy Note 10	748	2749
Google Pixel 4 XL	753	2628
LG G8 ThinQ	706	2429
Samsung Galaxy S8	343	1389
Google Pixel 3a XL	352	1338

■ Multi-Core   □ Single-Core

Conclusion:

In this paper we give the detailed information about 5G supported first snapdragon processors 855 and 865. 855 Mobile Platform is the first mobile platform to commercialize 5G, AI and XR in a new decade of revolutionary experiences.

Improved Checkout at Stores

-Darshan Naik   -Sanika Suthar   -Sumit Samanta

Introduction:

For many people, grocery shopping is a nightmare. It means having to make a list first then fight traffic and find a parking spot, bump your way through a labyrinth of shelves, shoppers, and shopping carts and find from thousands of products, brands, and prices in order to collect your necessities and stay within budget. By the time you reach to the check out and pay, searching a short line of overflowing carts and an old checkout system might be enough to make you cry. To improve this situation the owners can get on a conveyer belt powered automatic checkout machine to improvise the time and efficiency of checkout system.

Previous Generation Technologies:

When the customer arrives at cashier, the products are first kept on cashiers' desk after which the cashier will scan the product one by one later the total products and amount is calculated and further payment procedure is continued. This system consumes a more time.

New Technology Details:
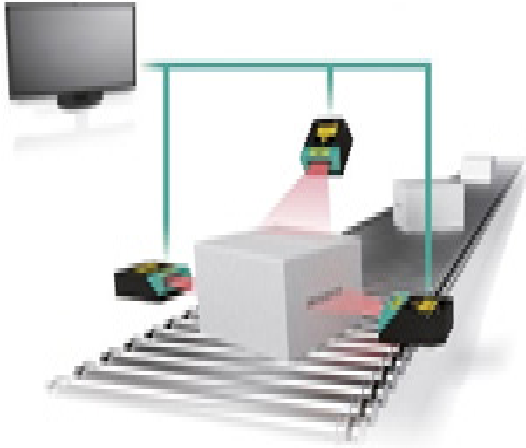
For a glance, if a cashier having to handle every item in your cart, you can just place your items on conveyor belt from where they get scanned automatically by the time, they reach to get packed. A 360-degree barcode scanner can be developed to scan the products placed on the conveyer belt.

Since the attendant does not have to scan all the items, they can simply pack the grocery so that the customer is ready to pay required amount and go by the time the cart is unloaded. The system is so effective that one attendant can handle two lines at a time. It is also be customize for different retail environments and multiple payment methods.

HOW IT WORKS

1: Items loaded on to conveyor belt. Goods pass through 360° at a rate of 100 items per minute

2: Each item is scanned in an average of 0.6 seconds. Conventional check-out takes up to 3 seconds

3: Once all items are in bagging area, member of staff presses a button to trigger chip and PIN card reader and screen

4: Second shopper can begin scanning as soon as the first's items have cleared the scanner. Second shopper's goods diverted to a second bagging area

Usefulness and Advantages:

The Advantage of such scanner can enhance the customer checkout experience and also it can reduce the number of checkout lane at the supermarket, allowing staff to move to other activitie

.

Limitation and Disadvantages:

Conveyer belt requires a bit more space than old system. This system can only be installed on supermarkets and such large stores but can't be to a grater use for small shops.

Conclusion and Future Scope:

This technology can increase customers due to capability of handling more checkout per time.

Satellite Internet

2nd Prize Winner (TE)
Techspark 2019-20 (TPP Competition)

-Disha Sakre   *-Jay Patel*

Introduction:

The Internet is the worldwide arrangement of interconnected PC that uses the Internet protocol suite such as TCP/IP to interface gadgets around the world. It is a system of systems that comprises of private, open, business, and government systems of nearby to a worldwide degree, connected by a wide cluster of electronic, remote, and optical networking technologies. The original aim of the internet was to establish a network that would allow users of research computer at university "to talk" to other universities. But today internet is a public facility accessible to millions of people worldwide.

Internet ships binary information. Information is made up of bits. It has two possible states, so we call it binary code. There are many systems that send binary information through various physical medium like fiber-optic cable or Wi-fi radio signals. Fiberoptic cables are used instead of copper wires today due to problem of attenuation and distortion.

Current technology:

As stated previously satellite internet is also currently in use at many places or for many private organizations but to provide this satellite internet for everyone is the main project and few companies are working on this projects amongst which the main three are Elon Musk's Space-X with project star-link, Amazon's project Kuiper and One web Project. Other names of projects include TELE Sat, LEO Sat (Low Earth Orbit Satellite) StarlinkProject

Elon Musk's company SpaceX launched 60 satellites on Falcon 9 rocket on 24th may, 2019 under the project Starlink. The project plans to launch 6 such group of satellites. The initial plan of this was to built prototype by 2016 and complete this until the year 2020. But now after the success of the two initial prototypes named tin-tin A and B further work is done on this project.

Idea of satelllite Internet:
Concept:

The concept behind this idea of establishing a connection of networks using satellite is simple and also being currently used but at a small scale. The traditional method uses optical fibers inside ocean depths on the other side this method with connect the networks from space with the use of satellite. Not that this idea is something very different because this idea is already used but not for connecting and providing internet to everyone. When the devices to be connected increases the area to be covered by a satellite also needs to be increased and to make a complete worldwide connection whole earth needs to be covered by satellites. The concept is to cover the complete earth atmosphere with satellites just as covered by the cables right now but this is not simple as to cover more area more satellites are required. These satellites will communicate with each other and also send communicate with devices on earth so simply the satellites will do the same job as the currently in use optical fibers do but the advantage is this signals could reach places where the wires can't reach making this idea a revolutionary concept.

Working:

The working of internet is same as currently process on the medium changes from glass optical fiber to vacuum in space. The receiver requests for an URL the request is send from the receiver's devices via wire to a dish antenna which could be fixed at roof top so at to connect properly to the satellite. The signal is now in space and can be send to another satellite via vacuum this is done using lasers. The advantage here is that the travel speed of signal in vacuum is much faster than that of glass which is 47% slower when compared. Further this signal is send to server machine and the request is received.

Disadvantages and Limitations

Satellite Internet is a technique for associating a PC to the Internet with a modem and satellite dish. The strategy is a possibility for the individuals who live in a region that doesn't approach link or DSL connections. The benefits of satellite Internet are availability and versatility. For organizations, satellite Internet availability is a decent backup technique.

- Increased height of the satellite from earth's atmosphere causes latency whereas low height covers less ground area of earth
- Less area covered requires more satellites which in turn causes more risk of collision, more cost of project and also the complexity of project increases
- More satellite also can cause more space debris and this space garbage need to controlled.
- So a proper combination of all numbers in required with proper height, latency and orbit.

Future scope and Uses:

The future of satellite internet is quite predictable as companies like SpaceX, Google, Amazon are working to launch satellites in order to provide access to internet in remote areas. So it's obvious that cable internet might get replaced by satellite internet in near future. If the drawbacks of satellite internet are overcome, cable internet will be the second choice of the users, satellite internet being the first. In future due to global warming, disasters such as typhoons and mudslides are going to be common and hence there is threat to the under-sea fiber cables. As we know natural calamities like tsunami in Japan and earthquake in Nepal are frequent. Usually mobile communication is lost over a large area because the poles get damaged. Therefore communication is mostly carried over satellite. Data or phone calls are sent directly to a satellite in space and, from there, to receiving stations on Earth.

Conclusion:

Satellite internet is not completely trying to replace the cable internet but trying to make internet accessible worldwide especially in remote, rural and disaster prone zones. Satellite internet is going to be a boon to the world of internet. When designing the satellite internet system, we must first estimate the distribution characteristics and laws of the business, and then guide the determination of satellite communication capacity and constellation design. Estimated cost of converting USA from 4G to 5G is about 150 billion whereas project Starlink has a budget of around 10 million. This satellite internet can change the way we use internet. This project can be really helpful for the 3rd world countries and provide and internet for schools and colleges. This idea is revolutionary.

Black Hole in a Nutshell

2nd Prize Winner (BE)
Techspark 2019-20 (TPP Competition)

-Nishant J Pimple   -Utkarsha P Pawar   -Tejashree A Salunke

Introduction:

Stars are incredibly massive collections of mostly hydrogen atoms that collapsed from enormous gas cloud under their own gravity. In their core, nuclear fusion crushes hydrogen atoms into helium releasing a tremendous amount of energy This energy, in the form of radiation, pushes against gravity, maintaining a delicate balance between the two forces. As long as there is fusion in the core, a star remains stable enough. But for stars with way more mass then our own sun the heat and pressure at the core allow them to fuse heavier elements until they reach iron.

Unlike all the elements that went before, the fusion process that creates iron doesn't generate any energy. Iron builds up at the center of the star until it reaches a critical amount and the balance between radiation and gravity is suddenly broken. The core collapses. Within a fraction of a second, the star implodes. Moving at about a quarter of the speed of light, feeding even more mass into the core. It's at this very moment that all the heavier elements in the universe are created, as the star dies, in a supernova explosion.

Previous Research:

The evidence for a supermassive black hole is called Messier 106 also known as NGC 4258, the giant elliptical galaxy M87, and several others verified their existence by studying the speed of the clouds of gas orbiting those areas (Narayan, 2005). The gigantic black hole at the heart of our Milky Way galaxy may be devouring asteroids every day. The latest discoveries give some tantalizing evidence as below: A striking influence on the neighborhoods Emitting forceful gamma-ray bursts devouring nearby stars Spurring the expansion of new stars (NASA, 2018).

Event Horizon:

If you looked at a black hole, what you'd really be seeing is the event horizon. The event horizon is the edge around the black hole where the escape velocity outperforms the speed of light. As indicated by Einstein's hypothesis of special relativity, nothing can travel faster through space than the speed of light. Anything that crosses the event horizon needs to be traveling faster than the speed of light to escape. In other words, it's impossible. So we just see a black sphere reflecting nothing. A smaller black hole has a small event horizon, while a super size massive black hole has a bigger event horizon . As a rule of thumb, the further away from the singularity you are, the longer you live.A smaller black hole would kill you before you even enter its event horizon, while you probably could travel inside a super size massive black hole for quite a while.
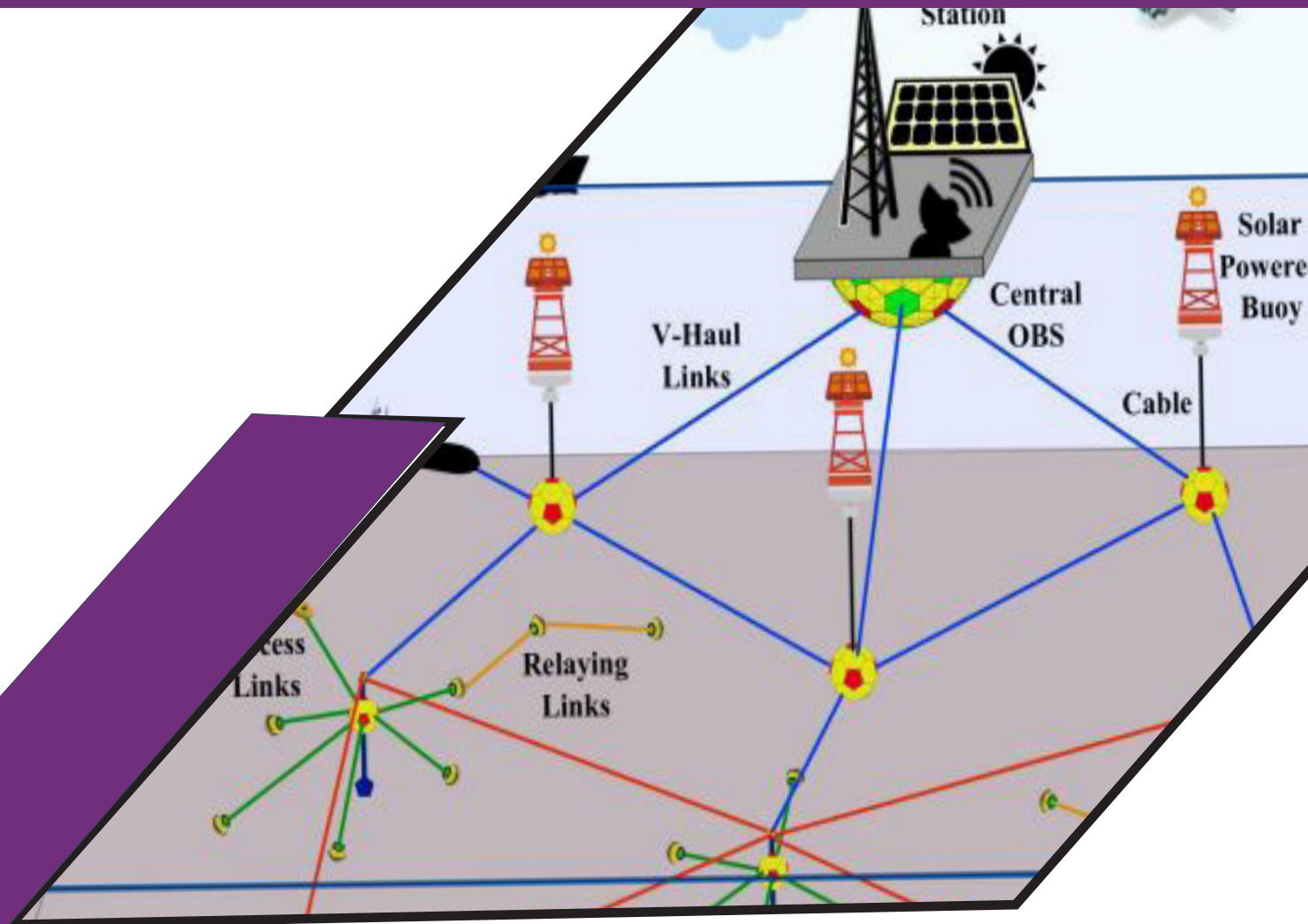
Structure and Characterising:

A black hole has two basic parts; the singularity and the event horizon. The singularity is at the center and is where the mass resides and the event horizon is the boundary that marks where the escape velocity from the mass, is the speed of light. Characterizing black holes' recounts the two different types of black holes: Schwarzschild black holes that do not rotate and Kerr black holes that do (NASA, 2016). The only distinguishing characteristics of black holes are their mass and their spin (Abdulkhalaq, 2013). The following provides some important ideas: Black holes cannot be observed directly, even by astronomers but they see behaviors related to them in other objects. Scientists also observe the presence of a black hole by its effect on its surroundings. A black hole in the middle of the galaxy would be very problematic to detect. Studying black holes relies heavily on indirect detection. The effects can include materials getting pulled into the black hole. Accretion disks forming around the black holes or stars orbiting a massive but unseen object (NASA, 2016).

Conclusion:

So that we now know that a black hole appears when an extraordinary amount of matter is concentrated in a tiny space. After passing the event horizon, there is nothing that can escape a black hole. This paper mainly focuses on the formation of black hole, the types and all the related information. It describes exactly what is event horizon and the evaporation process of black hole.

-Disha Sakre

Introduction:

Underwater communication is the technique of sending and receiving messages underwater. Using waves to communicate underwater can reduce various unmanned and independent underwater vehicles. So without human interference communication can be carried out. There are several methods to carry out this communication and the most common is using hydrophones. A hydrophone is a microphone designed to use underwater to record sounds underwater. Underwater communication is difficult due to the factors such as low available bandwidth, strong signal attenuation, time variation, etc. Underwater communication has low data rates as compared to terrestrial as it uses acoustic waves instead of electromagnetic waves. When higher data rates are needed, radio frequency (RF) method should be used. Electromagnetic (EM) waves, in the RF range, can also be a good option for underwater wireless communication systems. EM waves are less sensitive to reflection and refraction in shallow water than acoustic waves.

New Technology Details:

Design and Working:

The system design for underwater optical wireless communication is shown in Fig.1. It consists of a transmitter, receiver and underwater channel. Transmitter is made up of source, led, modulator, optics and beam steering system. Receiver

consists of optics, detector, signal processor and a demodulator. It consists of a source that generates information to be transmitted. Then the information is modulated on the optical carrier to be transmitted to longer distances with a high data rate. Projection optics and bean steering system helps to focus and steer the optical beam towards the position of the receiver. Then the information bearing signal is allowed to travel through the underwater channel whose characteristics vary according to the geographical time and location. At the receiving end, the collecting optics collects the incoming signal and passes it to the detector for optical-to-electrical conversion. The electrical signal is then allowed to pass through a signal processing unit and a demodulator for recovering the originally transmitted signal.

Transmitter: The market of optical components is already mature and evolved. Depending upon the requirements and keeping in mind underwater systems have mass and power constraints, choice of LED or laser is made. Both LEDs and lasers have their pros and cons. Lasers have fast switching time and high optical power but LEDs are cheap, simple, less temperature dependent and more reliable. Generally for system operating in shallow water, blue-green LEDs are used.

Receiver: The receiver in UWOC must have wide Field-Of-View, high gain and provide high signal to noise ratio. Most common photo-sensors in the blue-green region are: PMT, semiconductor photo-sensors and biologically inspired quantum photo-sensors. PMT is sort of vacuum tube that is exceptionally delicate to light. It is described by high addition, low clamor, high recurrence reaction and a huge assortment region. Be that as it may, their enormous size, more power utilization and delicacy makes them a poor the decision for UOWC.

Limitations of UWOC:
Although UOWC has many

advantages over acoustic and RF approach, along with advantages comes the disadvantages. Optical waves can suffer from severe scattering and absorption even if the wavelength of transmission light has been carefully selected in bluegreen spectrum. Due to the effect of scattering and absorption, UOWC suffers from poor bit error rate performance over a few hundred meter distance over a bad water environments. Matter present underwater such as chlorophyll is capable of absorbing red an blue lights. These matters thus increase the turbidity of water and hence shrink the propagation distance of light. These will increase the complexity of UOWC.

Future Scope:

UOWC is a more efficient technology than conventional acoustic links as it provides high data rates with no latency over moderate distance. This helps in reducing power consumption and promotes reliable underwater monitoring and surveillance applications for longer time duration. UOWC has applications in environmental monitoring, data collection, oil and gas monitoring and security. Ongoing research and development in the field of UOWC will provide efficient and robust way of communication between underwater devices and seafloor infrastructure. Low cost, small size, less power consumption and compatibility with other optical systems has advantage over acoustic communication and hence find its application in dense underwater wireless sensor networks.

Conclusion:

We conclude that even if acoustic waves are the robust and feasible carrier in today's scenario but with rapid technological development and active ongoing research in UOWC, this technology will be more promising with game-changing potentials in the near future.

Future of Tizen Operating System

-Rutuja Jadhav   -Poonam Bhagat   -Maitri Bhagat

Introduction:

An operating system is a group of computer program that let people interact with computer. Different operating system can be used for different purposes. Tizen is a Linux-based mobile operating system by the Linux Foundation but developed and used primarily by Samsung Electronics. The project was originally conceived as an HTML5-based platform for mobile devices to succeed MeeGo. Much of Tizen is open source software with proprietary components .Tizen OS written in HTML5,C,C++.The kernel type is a Monolothic.Userland is GNU.

The Tizen project was formed by the Linux Foundation in 2011 as a successor to MeeGo, another Linux-based mobile operating system, with its main backer Intel joining Samsung Electronics, as well as Access Co., NEC Casio, NTT DoCoMo, Panasonic Mobile, SK Telecom, Telefónica, and Vodafone as commercial partners. Tizen is very lightweight operating system that offers a faster start-up as compared to Android OS. Tizen;'s 3D window effects will provide best support for apps and games that require advanced 3D graphics features.
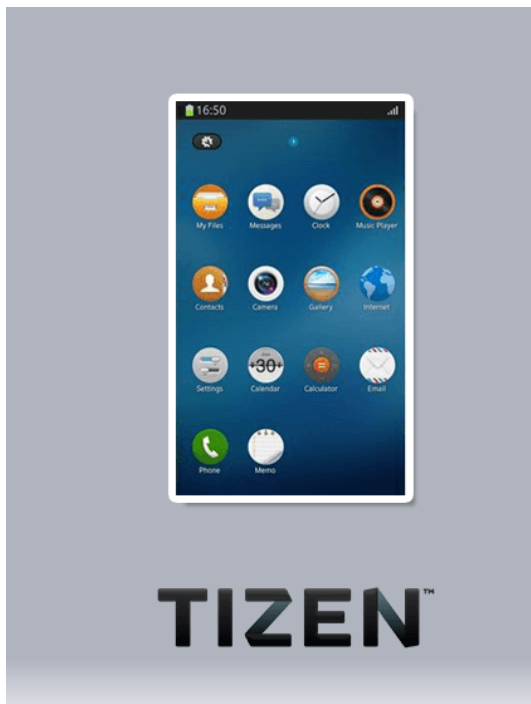
TIZEN™

Previous Generation Technologies:

- On September 16, 2012, Automotive Grade Linux announced its intent to use Tizen as the basis of its reference distribution.
- In January 2013, Samsung announced its intent to release multiple Tizen-based phones that year.
- In 2014, Samsung released the Gear 2 smartwatch that used a Tizen-based operating system as opposed to Android.
- On May 14, 2014, it was announced that Tizen would ship with Qt. This project was abandoned in January 2017.
- On November 16, 2016, Samsung said they would be collaborating with Microsoft to bring .

According research, approximately 21% of the smart TVs sold in 2019 run on the Tizen platform .

New Technology Details:

 We could say TIZEN and Android is very similar as they both are based on linux system. But there are lots of difference between them.

- Tizen will gain any traction much like Bada.
- Samsung will release a Tizen smartphones to test the waters.
- It will have many features as android.
- Tizen store will comparable to playstore.
- Tizen will help the customer's to seamlessly access various devises.
- Tizen will improve interactivity of user operations in smart devices using Tizen OS focusing on its drawbacks.

Usefulness and Advantages:

Advantages of using Tizen OS :

- It is an open source Operating System.
- The OS is Compatible with various mobile platform. ...
- The Tizen OS is so flexible to offer many applications and adapt too, with little changes.
- Immense personalization capability supported by ARM x86 processor.

Limitation and Disadvantages:

- It didn't work because no one is interested in Tizen ecosystem and there were hardly any third party apps available

Conclusion and Future scope:

To overcome the drawbacks of tizen operating system, change its drawback into its feature to give a competition to android, this is strong motive. The results show that Tizen will have the bright future.

Virtualization at Optimum
Operating System for Biology Labs

-Aditi More -Samiksha Mobarkar   -Siddhita Salunkhe

Introduction:

Operating system has become the most crucial part in biotechnology, computer engineering. Bio-informatics, bio-stimulation, antha are the various operating systems designed. Basically in the field of genomics to understand biological terms a software tool is used which is developed in the field of bio-informatics. Bio-informatics is a combination of field biology and information technology which includes various subjects like biology, computer science and mathematics which is used to analyse and to give description about biological data.

Antha is the software developed for biological operations built by Synthace. Therefore antha digitally powers biological research bringing new technology in lab. As antha consists of high and complex level programming language for biological research it, makes execution of experiments easy as well as reproducible. Synthace automatically captures and record data with the help of analytical equipment during experiment workflow which allows dynamic data visualisation.

Previous Generation Technologies:

Antha was used for automated DOE for optimising liquid handling workflows. Antha works with existing laboratory hardware, and due to its easy to use interface can execute workflows as simple or as complex as per the desires of users. More protocols were added or easily reproduced and shared for multiple identical experiments to run simultaneously. Antha allows to

- ■ Mixed Computer/Lab
- ☐ Lab work
- In silico
- ■ Testing in man
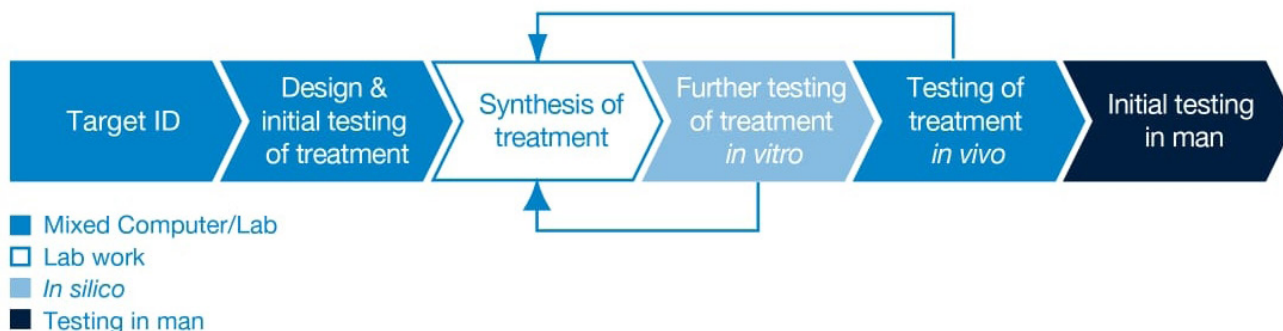
leverage all the benefits of multi-factorial optimisation without extensive planning. It is used to construct assembly or create our own assembly using the workflow editor.

New Technology Details:

Virtualisation is not only restricted to hospitals even the students can use this for the learning and to execute their biology practicals. The V-lab is the need of upcoming time. It will consist of different real time situations or scenarios based on integrated biology themes. This will help to simulate and visualise the process which will help in gaining knowledge quickly and will also help to learn its real time applications. With the rapid growth in this field the applications coming on-line for advanced bioprocessing solutions, assembly and construction of more software drivers are needed. The new analytics are enabling greater insights into cell and gene bioprocesses.

Computer-aided molecule design will give researchers a much better starting point in the search for potent molecules and reduce the need to run high throughput screens to find hits. It will still be necessary to test these molecules in in vitro and in vivo assays, until complete models of the anatomical and physiological characteristics of the human body in a healthy and diseased state are available.

Usefulness and Advantages:

Virtual labs can be very useful in the teaching of computer aided biology, particularly in cases where:

- Experiments are supposed to be done quickly.
- The experiments where observations are not obtained in safe environment.
- The experiment process take long duration as well as it is slow with.
- The experiments which involve risks to the health of learners and which are extremely dangerous.
- Use of Antha saves time and helps one to utilize that time and focus on science rather than logistics
- Resources and the optimisation is simple, efficient and even robust.

Limitations and Disadvantages:

Software drivers specific to each device need to be developed for which the process is difficult and complex.

Jobs which were done by humans first are done by robots i.e. staff is replaced by laboratory robots who do the tasks easily, hence unemployment problem arises.

The software cost much money which is not affordable for middle class and poor.

Conclusions & Future scope:

In future, blockchain may be the operating system in use which can provide a refrigerator that purchase milk, drone deliveries, autonomous vehicle also known as driverless cars or robotcar can move safely with no human input and is capable to sense.

Currently, synthace is working with microsoft so that in future will bring antha to clients via cloud computing.

KILL KIT

-Pranav Mahadeokar

Introduction:

The thought behind the project is to raise concern of excessive and unnecessary use of pesticideswhich harm the crop production and quality, leading soil and water erosion.The prime purpose is to understand genuine needs of Farmers.

The project kill kit automated pesticide sprinkler system is all in one farming solution encompassing 3 features :-

• Insect killing .
• Kills Snake and rat.
• Sprays pesticides.
•

The ultimate goal is increase crop yields and productivity by reducing competitive environmental factors.

Previous Generation Technologies:

Conventional underground pesticides sprinklers, which is a electric motor based mechanism.

Manual hand held sprinklers, in this process farmer has to cover entire farm and sprinkle even when the crop is perfect, but he has to do it because of fear crop damage by insects and rats.

Types of practices which occurs in pesticides sprinkling :-

1. A manual backpack sprayer
2. Simple sprinkler
3. Thermal fogger
4. Tractor sprinklers

Fig: Agri Drone

Fig: Earth rover

Fig: Agri insect killer

New Technology Details:

The insect killer circuit presented here is designed to attract insects during night, and electrocute them through a high voltage mesh trap. The unit can be installed in farms for protecting crops from potentially harmful insects. The unit being solar powered does not depend on human intervention and works independently.

The shown set up indicates a solar panel placed at the top of the structure, the high voltage collector mesh can be seen clamped vertically just below the solar panel, while a LED can be witnessed positioned beside the mesh trap. The battery and the circuit are enclosed inside a wooden "house" like structure which becomes the base for all the above described fabrications. The slanting roof of the house shaped cabinet ensures that the insects slide and fall down on the ground while they hit the mesh and get killed. The bulb is used for attracting the insects, as we all know that any form of light attracts insects towards it and the same principle works here for luring the insects near the high voltage mesh trap. The bulb could be either an LED lamp, a low wattage CFL lamp or or an UV wood's lamp.

Usefulness and Advantages:

1. Hassle free, No human intervention
2. Automated Rover (covers farm as whole completely).
3. Solar powered.
4. Pests strayed only when needed
5. Environmental friendly (prohibit soil and water erosion)
6. Insects automatically get attracted towards system.
7. One time investment.

Limitation and Disadvantages:

1. Servicing and maintenance is very necessary for long life of the Rover.
2. Inefficient during rainy season.
3. Expensive.

Conclusion and Future Scope:

Awareness is the prime limitations of this technology, the more people engage in such technology related conversation and contribute towards new farming methodologies we'll see a revolutionary farming practices in India. Similar to this technology drones are becoming famous regarding fertilizers and pesticides sprayers, image processing will lead enormous victory in near future as this most convenient and potential technology.

A POLYDIMETHYLSILOXANE-COATED METAL STRUCTURE FOR ALL-DAY RADIATIVE COOLING
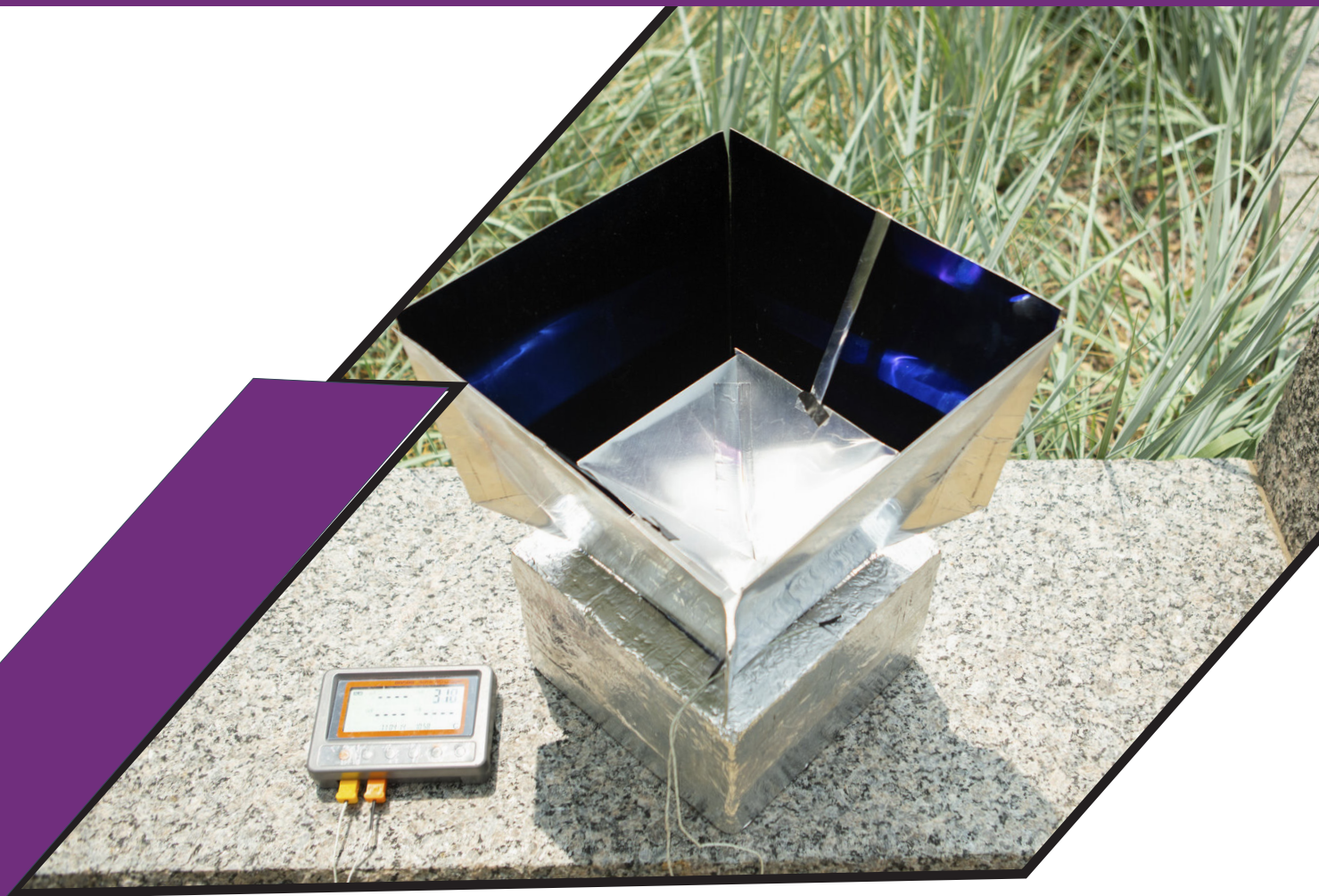
-Sanjana Desai   -Neeraj Guhagarkar   -Nidhi Singh

Introduction:

The global electricity demand is increasing day by day and air conditioning consumes approximately 15% of the primary energy, in the United States, as studies show.In some tropical zone countries like UAE, Saudi Arabia conditioning share 70% of the total electricity consumption.Hence a passive cooling strategy is used which requires very less or almost no electricity consumption. To realize the envisioned all-day continuous cooling, it is essential to achieve efficient radiative cooling during the day, when peak cooling demand actually occurs.The system consists of a special material an inexpensive polymer/aluminum film that's installed inside a box at the bottom of a specially designed solar "shelter."This architecture serves a dual purpose: First, it helps to sponge up sunlight. Second, the shape of the walls and cone direct heat emitted by the film toward the sky.

New Technology Details:

PDMS is a promising inexpensive material for daytime radiative cooling due to its transparency in visible regime and strong thermal emissivity in the mid-infrared regime. Here we propose a simple planar PDMS/metal (aluminium or silver) film structure to realize an inexpensive thermal emitter for radiative cooling. For a 150μm-thick PDMS film, the optical absorption in visible to

b
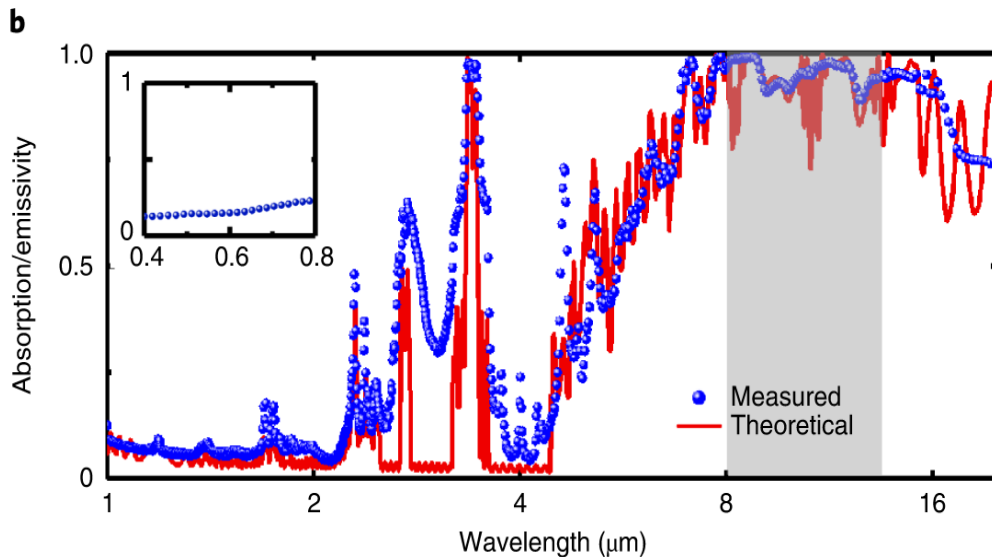
near-infrared spectrum domain is relatively weak.µm. The absorption/emissivity ratio in the wavelength range of 8–13µm is close to unity when the PDMS thickness is beyond 100 µm. Therefore,this structure is tolerant of large roughness in a PDMS film with thickness over 100µm, which is convenient for inexpensive manufacturing over huge scales.

The system consists of a special material an inexpensive polymer/aluminum film that's installed inside a box at the bottom of a specially designed solar "shelter." The film helps to keep its surroundings cool by absorbing heat from the air inside the box and transmitting that energy through the Earth's atmosphere into outer space.The polymer stays cool as it dissipates heat through thermal radiation, and can then cool down the environment. This is called radiative or passive cooling, and it's very interesting because it does not consume electricity it won't need a battery or other electricity source to realize cooling.

Usefulness and Advantages:

One of the most attractive features associated with radiative cooling is the potential to reduce electricity consumption for cooling in metropolitan areas.In this paper, we report an inexpensive planar PDMS/metal thermal emitter thin film structure that is useful for efficient radiative cooling applications over large areas.One of the innovations of our system is the ability

to purposefully direct thermal emissions toward the sky.Compared with a recently published new solution-based thermal emitter material for daytime cooling, this PDMS/aluminium structure is easier to fabricate at a much lower price due to its commercial availability.

Limitation and Disadvantages:

This paper results revealed a practical limitation to implement radiative cooling technology in urban areas: although all buildings have access to the clear sky on their roofs, the radiative cooling performance will be affected significantly by the surrounding architecture .To overcome this practical limitation, we will propose an improved system design using a beaming effect of thermal radiation.

Conclusion and Future Scope:

In this paper a highly efficient and low-cost passive cooling technology by exploiting the sky as the cold source. The proposed planar PDMS/aluminium cooling structures efficiently send invisible, heat-bearing light within the transparent window of the Earth's atmosphere directly into the cold outer space and realized up to 11°C temperature reduction. The proposed technology thus has disruptive potentials in transforming cooling solutions in a wide range of industrial and residential applications.

DARK WEB: THE HIDDEN WORLD OF INTERNET

Surface Web

Exploring
The Hidden
Internet

4%

Deep Web

Legal Documents

Government Records

Scientific Reports

90%

Academic Records

Financial Records

Dark Web

Drugs

-Mohitkumar Gupta   -Rahul Panga   -Shyam Gupta

Introduction:

The dark web is a part of the internet which is hidden from the normal open internet world. The hidden internet is not indexed by Some popular search engines due to their volitation of policies set by Search Engine, in the dark web all illegal activities like selling, buying of unregistered arms, guns even illegal selling of drugs or exchange stolen information.

Information About Technology:

Darkweb can be said as a secret section of the internet which is hidden from search engines, crawls
robots is a hotspot for illegal activities. Fig.1 is an overall view of the current internet structure, from the above Fig we can clearly see the what we see on the open internet is just a 4% of the overall internet where all the things which are displayed are either restrictions free or are not illegal which requires Username and password to log in, the deep web is estimated about 400-500 times larger than the common open World wide web, and the dark web is smaller which is made up of series of encrypted networks connect which are able to hide the users identities, location and lot more of identification data and can only be accessed by special software which is capable of communicating such encrypted network. It turns out that the first-ever online sale happened in the early 70s and was in fact cannabis. Students at Stanford sold weed to students at MIT.

The Dark Web properly got its start in March of 2000 with the release of Freenet. The service still exists today and provides a censorship-resistant way to use the web. The most important Dark Web development of all time was happened in 2002, with the release of TOR or The Onion Router. It was created by non-other than the US government, as a way to help their own operatives remain untraceable. It is said that the Dark Web of today could not exist without this technology.

It also has search engines but the problem is they never show relevant query results as the nature of the page gets changed frequently and they are crawlers get an error.

Things You can Buy from the dark web:-

1. Drugs
2. Counterfeit money
3. Forged papers
4. Firearms, Ammunition, and Explosive
5. Hitmen
6. Human organ
7. Hackers for Hire

The deep web has been around for many years however, it was not until October 2013 that the general public really began to become aware of it. This was due to the primary deep web market place, 'The Silk Road', being shut down by the FBI, with its creator and host being arrested. The creator was caught after he tried to hire a hitman through the site who was actually an undercover FBI agent.

Usefulness and Disadvantages:

*   Hidden Search Results - Searching the hidden world also helps in exploring unknown content and information around the globe.
*   Light in the Darkness - Deep Web connections are anonymous and difficult to monitor, facilitating access to current news from around the globe without government filtering, "interpretation" or censorship.
*   Anonymity – Anonymity results in freedom on the internet user can view anything without any restrictions.
*   Freedom of speech – users can freely express their opinion without fearing of protection that most county people take granted.
*   Amazing individuals – it helps individuals to bring up their ideas and put forward without any restriction from their professional life.

Limitation and Disadvantages:

*   Untraceable – People doing Digital crimes using the dark web are untraceable from police forces, this increases the peoples confidence to do more crime without any hassle.
*   Phishing and scams - Phishing via cloned websites and other scam sites are numerous.
*   Illegal and ethically disputed pornography- There is regular law enforcement action against sites distributing child pornography. Other content includes sexualized torture and killing of animals and revenge porn.

Conclusion and Future Scope:

The deep web will continue to perplex and fascinate everyone who uses the internet. It contains a good amount of knowledge that could help us evolve technologically. And of course, it's darker side will always be lurking too, just as it always does in human nature. Regardless of if the Dark Web exists or not, the criminal offense still occurs. The Dark Web just provides an easy way to connect with people of similar interests and to facilitate further interaction.

> ## "THE GREAT MYTH OF OUR TIMES IS THAT TECHNOLOGY IS COMMUNICATION"

MAGAZINE DESIGNED BY

ANIKET GURAV

PRASHANT SINGH

SAURABH HADPE

SUYASH KOLTHARKAR

BALAJI MHETRE