From HOD's Desk

I am immensely proud to present to you **Ninth edition** of VCET Information Technology's Departmental Magazine ,"**LOGIN…To Xplore** ".The magazine you are holding in your hands right now is the epitome of the zealous activities and profound involvement of the students as well as the staff of the Information Technology Department.

This Magazine will take you through a thrilling journey of fast paced world of changing and emerging IT industry and technologies thereby acquainting you readers with the hitherto unknown marvels of the world of technology. For second, third and fourth year students, it will provide the invaluable inside into what to be ready for, what skill sets are essential in the industry and thus how to prepare themselves for employment. The department staff predominantly the Staff-In-Charges of the I-TECH committee Prof.Bharati Gondhalekar and the students who have worked tirelessly for this magazine are to be highly congratulated for bringing out such a fine, informative piece of publication. I hope the IT Department and I-TECH Committee will continue to strive and make mammoth efforts to keep up their good work and raise the bar of their soaring ability.

Happy Reading!

Prof.Madhvi Waghmare

Head Of Department, INFT

VCET

From Staff-Incharge's Desk

We are happily delighted to present to you the **Ninth edition** of "**LOGIN… To Xplore**", the Annual Technical Magazine of the Department of Information Technology. The magazine that you hold in your hands now is an outcome of grueling efforts of everyone involved in making fueled by right mix of passion, dedication and determination. The magazine under I-TECH committee was first published in the academic year 2009-2010.The first edition of magazine was named "Dig-It" which was later named as "Login…To Xplore".

The Key Purpose of this magazine is to convey to the readers the trends and developments in the field of Information Technology. In this edition of the magazine the I-TECH committee aspires to provide the students with continual exposure to the ever increasing scope of Information Technology enriching the knowledge based in their chosen field and thereby acquainting them with knowledge pertaining to the IT industry that awaits them for and behalf of I-TECH committee we would like to extend our sincere gratitude to Dr.A.V.Bhonsale-Our honorable principal for his support and guidance as also Prof. Madhavi Waghmare - H.O.D of information Technology Department for constantly encouraging us to make this magazine bigger and better and infusing us with dynamism to succeed in our endeavors. Also a special word of thanks to our dedicated Team of Designers, Editors, and PRs as also the entire I-TECH Committee who have put in their heart and soul to the making of this magazine.

 We are sure you will enjoy the technological extravaganza this magazine holds.

Prof.Bharati Gondhalekar
Staff-In-Charge,
ITECH-Committee

Chairperson's Desk

"Education is the passport to the future, for tomorrow belongs to those who prepare it today."
-Malcolm X

I take this opportunity to thank and congratulate all members of ITECH for their support throughout in compiling "LOGIN" . ITECH keeps the students updated of recent technological advancement and researches. If science is invention... Technology is the practical application of the invention...

This magazine highlights industry traits & skills needed for employment.

I would extend my thanks to our staff in charge Prof. Bharati Gondhalekar who guided and supported the whole ITECH team. We are thankful to all the teaching and non teaching staff members of IT Department for their support & guidance.

In this endeavor, ITECH will keep on pushing its limits and outgrow each year by organizing events like "ELIXIR", I look forward to a productive association of staff and students to expand the committee & I am sure with this magazine and website we would go a long way in the future.

Tejas Patil

Chairperson,

ITECH-Committee.

LOGIN

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Programming languages defining the future of coding.

1. R

R is a programming language, but it's more of a standard bearer for the world's current obsession with using statistics to unlock patterns in large blocks of data. R was designed by statisticians and scientists to make their work easier. It comes with most standard functions used in data analysis and many of the most useful statistical algorithms are already implemented as freely distributed libraries

Highlights: Clever expressions for selecting a subset of the data and analyzing it

Headaches: Aimed at desktops, not the world of big data where technologies like Hadoop rule.

2. Swift

Apple saw an opportunity when programming newbies complained about the endless mess of writing in Objective C. So they introduced Swift and strongly implied that it would replace Objective C for writing for the Mac or the iPhone. They recognized that creating header files and juggling pointers was antiquated. Swift hides this information, making it much more like writing in a modern language like Java or Python. Finally, the language is doing all the scut work, just like the modern code.

Highlights: Dramatically cleaner syntax and less low-level juggling of pointers

Headaches: The backward compatibility requires thinking about bits and bytes occasionally.

3. Go

When Google set out to build a new language to power its server farms, it decided to build something simple by throwing out many of the more clever ideas often found in other languages. They wanted to keep everything, as one creator said, "simple enough to hold in one programmer's head." There are no complex abstractions or clever metaprogramming in Go—just basic features specified in a straightforward syntax.

Highlights: Just a clean, simple language for manipulating data.

Headaches: Sometimes a clever feature is needed.

4. CoffeeScript

Somewhere along the line, some JavaScript programmers grew tired of typing all those semicolons and curly brackets. So they created CoffeeScript, a preprocessing tool that turns their syntactic shorthand back into regular JavaScript. It's not as much a language as a way to save time hitting all those semicolons and curly bracket keys.

Jokers may claim that CoffeeScript is little more than a way to rest your right hand's pinkie, but they're missing the point. Cleaner code is easier to read, and we all benefit when we can parse the code quickly in our brain.

Highlights: Cleaner code

Headaches: Sometimes those brackets make it easier to understand deeply nested code.

5. D

For many programmers, there's nothing like the very clean, simple world of C. The syntax is minimal and the structure maps cleanly to the CPU. Some call it portable Assembly. Even for all these advantages, some C programmers feel like they're missing out on the advantages built into newer languages.

That's why D is being built. It's meant to update all the logical purity of C and C++ while adding in modern conveniences such as memory management, type inference, and bounds checking.

Highlights: Some of the most essential new features in languages.

Headaches: You trade some power away for the safety net.

Yash Shah

TE IT

Top 10 Highest Paying IT Courses, Jobs in 2018

1. PMP certification Course Online

Administered by the Project Management Institute, PMP certification Online is the most sought-after course among IT professionals. With the ability to apply the Project management principles one can gain a firm foothold in management level positions across various industries. This certification exam tests your knowledge across various stages of the life cycle to project- initiating, planning, executing, monitoring and controlling, and closing. It validates your skills as a project manager; that you can manage teams, time and budget effectively. PMP exam has stringent prerequisites of thousands of hours of leadership experience, **4500-7500 hours of project management experience** (based on educational qualification) and formal project management education of 35 hours. The exam questions are based on real-world scenarios where one needs to apply the theoretical knowledge learned. **On an average, a PMP certified professional earns $105,324 per year**.

Looking for PMP Online Certification Course, attend demo now!

2. AWS Certification (AWS Certified Solutions Architect – Associate) Online

AWS has become the entry point for those seeking a career in the cloud architecture space. As the world is moving towards the cloud platform, a certification course helps you expand your expertise in this area. It validates that you have advanced technical skills needed to effectively

design, deploy and operate scalable applications and infrastructure on AWS. It enhances your career prospects and gives you an upper hand during salary negotiations. On an average, an **AWS certified professional earns $120,000 per year**. An AWS certified Solution Architect-Associate is suited for individuals who have at least 6 months experience in designing distributed applications on the AWS platform. The exam consists of 60 questions that test one's expertise in designing and deploying applications on AWS, estimating AWS costs and identifying cost control measures.

Learn AWS Certification Course Online from AWA online Training

3. Hadoop Admin

As businesses across various industry verticals are embracing Big data, Hadoop Admin is becoming a popular IT skill that most professionals want to develop. There is a huge gap in the demand and availability of expert Hadoop talent. So a certification in Hadoop Admin Course will certainly increase your marketability. As companies scramble through thousands of resume, the candidates with a formal Hadoop Admin certification will definitely be at an advantage. It is a proof that you have hands-on experience of working on real projects and the capability to work with various components of Hadoop ecosystem.

4. Digital Marketing

A **Digital marketing certification course** is a must for someone who is looking for a career in this field. This certification helps employers differentiate between people who have the right skill set from those who just falsely claim to have the knowledge in this domain. A certification course is a proof that you have real-life experience in launching and executing digital marketing campaigns. It shows that you are up to date with the latest digital marketing tools and techniques needed to build effective strategies. It is a must for people who want to kickstart their digital marketing career, as it makes you job ready.

Become digital marketing professional in 45 days with AWA's

Digital Marketing Training

5. Data Analytics/Science (Big Data Analytics)

As the competition stiffens, organizations are turning to specialists who can analyze and interpret data to identify new opportunities for their products and develop effective strategies. Data Analytics has, in fact, become a top priority for businesses looking for growth. And therefore the demand for data analysts has increased manifold. A certified professional in this field gets 50% more pay than his counterparts as he is easily able to win the trust of the employers. Since the data analytics professionals form an integral part of business decisions and strategies, organizations want to make sure that they hire nothing but the best.

6. Certified in Risk and Information Systems Control (CRISC)

CRISC is an ideal certification for risk professionals who face unique challenges of IT and enterprise risk management. This certification will enable them to become strategic partners, understand the business risk and implement appropriate IS controls. If you undergo this assessment you will get a valid stamp on your resume that you have the knowledge and expertise to manage IT risks. If you are already working in this field, this exam will give you a competitive edge over your peers. The certification is offered by a non-profit group ISACA. 150 MCQs test various areas including Risk Identification, Risk Assessment, Response and Mitigation, Control Monitoring and Reporting. The prerequisite for taking this exam is to have a minimum 3 years of experience in at least two of the above-mentioned subject areas. More than 18,000 people have undergone this certification course worldwide. But the demand for such professionals is much more. That is why it is one of the highest paying certification courses.

Reference: Certified in Risk and Information Systems Control (CRISC) – $131,298

7. Certified Information Security Manager (CISM)

The **CISM** exam is ideal for information security managers, aspiring managers and IT professionals involved in information security, assurance, risk management and governance. It validates their skills and experience in the field of information security management and proves that they can develop security programs and practices that prevent security breaches. It is,

in fact, a globally recognized and accepted standard of achievement in this area.The 200 MCQs in the exam test one's knowledge on various subject areas like Information security management, Information risk management and compliance, Information security program development and management and Information security incident management. One also needs at least 5 years of experience in the IS field with 3 years of management experience. This can be gained within 10 years prior to the application date or even within 5 years after clearing the exam. **A CISM certified professional earns 45% more than the non-certified counterparts**.

8. Certified Information Systems Security Professional (CISSP)

CISSP exam is offered by International Information Systems Security Certification Consortium, which is non-profit organization specializing in IT security. This exam is an awidely accredited evaluation of one's knowledge in the information security field. With this credential on your resume, you can definitely gain credibility that you can design, implement and manage the security strategies and protect the business from security breaches. Employers can easily trust that you have the technical prowess and expertise to design suitable policies to take care of information security needs of the organization. The test comprising of 250 MCQs is based on eight areas in security including security and risk management, communications and network security, software development security, asset security, security engineering, identity and access management, security assessment and testing, and security operations.

9. Certified Information Systems Auditor (CISA)

As cybersecurity has gained importance, so has the role of system auditors who understand ways of protecting and auditing IT systems. **CISA** is ideal for people interested in IS Auditing, IS Controls and IS security. One needs 5 years of experience in these fields to qualify for this certification. The experience can be gained 10 years prior to the application date or within 5 years from the date of passing the exam. Today all companies are heavily dependent on IT systems irrespective of the type of industry. These companies look for certified professionals to fill the roles of auditing, controlling and monitoring IT systems. CISA is offered by Information Systems Audit and Control Association. This

certification confirms that the individual is competent and qualified to handle this role efficiently. It is recognized globally and therefore it helps people who want to pursue a career overseas as well.

10. <u>Microsoft Certified Solutions Expert (MCSE) – Server Infrastructure</u>

Earning a credential in MCSE certifies that you have the technical skills and expertise to perform complex roles in Microsoft technologies. It acquaints you with the recent developments in this field and prepares you for a lucrative job opportunity in this domain. So if you want to advance your career and earn a higher pay in a role that requires building, deploying and operating Microsoft based systems, then this is the certification that you should go for.

Krunal Shah
TE IT

TOP TECH COMPANIES IN INDIA.

1. TATA CONSULTANCY SERVICES.

Established in 1968, Tata Consultancy Services has grown to its current position as the #1 most powerful IT services brand based on outstanding track record, long-term partnerships, collaborative innovation and corporate responsibility. Tata Group, which founded by Jamsetji Tata in 1868, is one of India's most respected institutions today. The Tata Group is a global enterprise today, headquartered in India, comprising over 100 independent operating companies. Tata Sons is the principal investment holding company and promoter of Tata companies.

Mailing Address:
Tata Consultancy Services Limited
9th Floor, Nirmal Building, Nariman Point,
Mumbai 400 021, India
Ph: +91-22-6778 9595
     +91-22-6778 9191

2. INFOSYS:

Established in 1981, Infosys is a NYSE listed global consulting and IT services company with more than 200,000 employees. In the journey of over 35 years, they have catalyzed some of the major changes that have led to India's emergence as the global destination for software services talent and also pioneered the Global Delivery Model and became the first IT Company from India to be listed on NASDAQ.

Infosys is a global leader in technology and consulting services. They deliver the most extraordinary software projects, on the basis of extreme advances in technology, especially in areas such as Automation and Artificial Intelligence.

Mailing Address:
Infosys - Center Point,
Offshore Development Center,
City: Bangalore
State: Karnataka
Pincode: 560100

3. WIPRO:

Wipro Limited is a leading global information technology, consulting and business process services company. They harness the power of cognitive computing, hyper-automation, robotics, cloud, analytics and emerging technologies to help the clients adapt to the digital world and make them

successful. A company recognized globally for its comprehensive portfolio of services, strong commitment to sustainability and good corporate citizenship.

Mailing Address:
Wipro Limited
Doddakannelli, Sarjapur Road, Bengaluru - 560035
Tel: +91 80 28440011
Fax:+91 80 28440256

4. TECH MAHINDRA.

Tech Mahindra Limited is an Indian multinational provider of information technology (IT), networking technology solutions and Business Process Outsourcing (BPO) to the telecommunications industry. Anand Mahindra is the Chairman of Tech Mahindra, which is headquartered at Pune and has its registered office in Mumbai.

It provides services to customers which include Fortune 500 companies. It is also one of the Fab 50 companies in Asia, a list compiled by Forbes. Tech Mahindra was ranked #5 in India's software services (IT) firms.

Mailing Address:
Tech Mahindra Ltd.
Sharda Centre, Off Karve Road
Pune - 411004 (Maharashtra) India
Phone:+91 20 66018100

5. LARSEN & TOUBRO INFOTECH:

Founded 20 years ago, as the information technology arm of the Larsen & Toubro group, their unique heritage gives unrivaled real-world expertise to solve the most complex challenges of enterprises across all industries.

LTI is a global technology consulting and digital solutions company helping more than 250 clients succeed in a converging world. With operations in 27 countries, they go the extra mile for their clients and accelerate their digital transformation with LTI's Mosaic platform enabling their mobile, social, analytics, IoT and cloud journeys.

Mailing Address:
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Mahape, Navi Mumbai,
Maharashtra 400710
Phone: 022 6795 4545

Khushboo Memon

TE IT

TOP 5 POSTS IN IT COMPANIES

Software Developer

Software developers invent the technologies that we sometimes take for granted every day. For instance, that app that rings, sings or buzzes you out of a deep sleep in the morning? A software developer helped design that. And when you roll into the office and turn on your computer, clicking and scrolling through social media, music and your personal calendar – software developers had a big hand in shaping those, too.The best software developers are creative and have the technical expertise to carry out innovative ideas.A software developer's average salary of $104,300, is higher than most other occupations

Information Security Analyst

Information security analysts are the gatekeepers or security guards of information systems. To explain it another way: These professionals plan and execute security measures to shield an organization's computer systems and networks from infiltration and cyberattacks. They prevent, monitor and respond to data breaches and cyberattacks, which are becoming more common.The government, health care organizations, financial systems and other companies are growing more reliant on information security analysts to protect their information systems against hackers and cyberattacks. Information security analysts made an average wage of $96,040

IT Manager

Computer and information systems managers, or information technology managers, are the guides who help organizations navigate the always-changing labyrinth that is modern technology. These all-important employees deliver short- and long-term visions for the company's technology needs and goals.IT managers also install and upgrade an organization's computer system and protect the office network from hackers and malware. IT managers are well-paid for their work and make $145,740 per year.

Database Administrator

Database administrators set up databases according to a company's needs and make sure they operate efficiently. They will also fine-tune, upgrade and test modifications to the databases as needed. With information so readily available in this era of apps, tablets and social media, data has become the new treasure organizations must protect and cherish. More than anyone else, database administrators are relied on as the guardians of this treasure, implementing
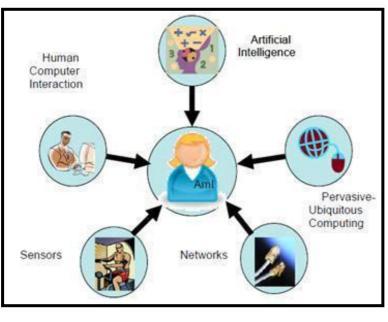
security measures to ensure sensitive data doesn't fall into the hands of unruly pirates while also managing the databases that help store and organize it. Database administrator salaries are among the highest base wages in IT with a salary of $98,500 - $ 148,500

Web Developer

Web developers are responsible for creating websites. When these artists do their jobs well, everything about the site seems to fit together superbly, from the colors and graphics, to the images and special effects (or "animation," to those in the know), to the navigation. Although some web developers will design a website's front and back end, many web development companies split these responsibilities. For instance, some web developers will work in Photoshop to create the overall design, while others will be in charge of writing the code in programming languages such as HTML and CSS. web developers make a median salary of $66,130

Revathi Nair

TE IT

Ambient Intelligence emerging technology.

Ambient Intelligence (AmI) is a new paradigm in Information Technology that has potential for great impact in the future. The vision of AmI is that the people will be surrounded by intelligent objects that can sense the context and respond according to the desire of the people. AmI is a multidisciplinary topic, since it combines the features of many of the areas in Computer Science.

In the last five years, we have seen significant advances in three promising technology areas: virtual environments, in which 3D displays and interaction devices immerse the user in a synthesized world, mobile communication and sensors, in which increasingly small and inexpensive terminals and wireless networking allow users to roam the real world without being limited to stationary machines. The merging of these areas allows the emergence of a new vision: the Ambient Intelligence (AmI).

AmI refers to a digital environment that proactively, but sensibly, supports people in their everyday lives. It will make the feeling that the people live with technology. It is aligned with the concept of disappearing computers, since the AmI environment make the technology invisible. As the devices grow smaller, more connected and more integrated into our environment, the technology disappears into our surroundings.The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it.The basic idea behind AmI is that by enriching an environment with technology (mainly sensors and devices interconnected through a network), a system can be built to take decisions to benefit the users of that environment based on real-time information gathered and historical data accumulated.

An important aspect of AmI has to do with interaction. On one side there is a motivation to reduce the human-computer interaction as the system is supposed to use its intelligence to infer situations and user needs from the recorded activities, as if a passive human assistant was observing activities unfold with the expectation to help when (and only if) required. On the other side, a diversity of users may need or voluntarily seek direct interaction with the system to indicate preferences and needs. The entire environment around us, homes and offices, cars and cities, will collectively develop a pervasive network of intelligent devices that will cooperatively gather, process and transport information

Ambient Intelligence Key Technologies:

The benefit of an AmI system is measured by how much can give to people while minimizing explicit interaction. The aim is to enrich specific places (a room, a building, a car, a street) with computing facilities which can react to peoples need and provide assistance. In order for AmI to become a reality a number of key technologies are required:

- Unobtrusive hardware (Miniaturisation, Nanotechnology, smart devices, sensors etc.)

- Seamless mobile/fixed communication and computing infrastructure (interoperability, wired and wireless networks, service-oriented architecture, semantic web etc.)

- Dynamic and massively distributed device networks, which are easy to control and program (e.g. service discovery, auto-configuration, end-user programmable devices and systems etc.).

- Human-centric computer interfaces (intelligent agents, multimodal interaction, context awareness etc.)

- Dependable and secure systems and devices (self-testing and self repairing software, privacy ensuring technology etc.)

Sridhar Subramanian

TE IT

AUGMENTED REALITY

What is Augmented Reality?

Augmented reality is the technology that expands our physical world, adding layers of digital information onto it. Unlike Virtual Reality (VR), AR does not create the whole artificial environments to replace real with virtual one. AR appears in direct view of an existing environment and adds sounds, videos, graphics to it.

A view of physical real-world environment with superimposed computer-generated images, thus changing the perception of reality, is the AR.

The term itself was coined back in 1990, and one of the first commercial uses were in television and military. With the raise of Internet and smartphones, AR rolled out its second wave and nowadays is mostly related to interactive concept. 3D models are directly projected onto physical things or fused together in real-time, various augmented reality apps impact our habits, social life and entertainment industry.

AR apps typically connect digital animation to a special 'marker', or with the help of GPS in phones pinpoint the location. Augmentation is happening in real time and within context of the environment, for example overlaying scores to a live feed sport events.
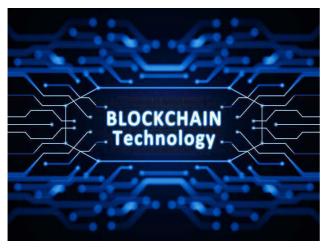
There are 4 types of augmented reality today:

1. markerless AR
2. marker-based AR
3. projection-based AR
4. superimposition-based AR

In 2013 Google beta tested the Google Glass – with internet connection via a Bluetooth. In 2015 Microsoft presented two brand new technologies: Windows Holographic and HoloLens (an AR goggles with lots of sensors to display HD holograms). In 2016 Nianticlaunched Pokemon Go game for mobile devices. The app blew the gaming industry up and earned $2 million in just first week.

Purvesh Desai
TE IT

14

BLOCKCHAIN

What is Blockchain Technology?

"The practical consequence [...is...] for the first time, a way for one Internet user to transfer a unique piece of digital property to another Internet user, such that the transfer is guaranteed to be safe and secure, everyone knows that the transfer has taken place, and nobody can challenge the legitimacy of the transfer. The consequences of this breakthrough are hard to overstate."

- Marc Andreessen

From a cruising altitude, a blockchain might not look that different from things you're familiar with, say Wikipedia.With a blockchain, many people can write entries into a record of information, and a community of users can control how the record of information is amended and updated. Likewise, Wikipedia entries are not the product of a single publisher. No one person controls the information.

Descending to ground level, however, the differences that make blockchain technology unique become more clear. While both run on distributed networks (the internet), Wikipedia is built into the World Wide Web (WWW) using a client-server network model.
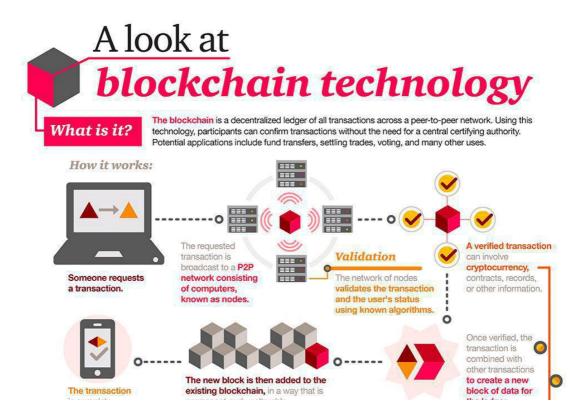
A user (client) with permissions associated with its account is able to change Wikipedia entries stored on a centralized server.

Whenever a user accesses the Wikipedia page, they will get the updated version of the 'master copy' of the Wikipedia entry. Control of the database remains with Wikipedia administrators allowing for access and permissions to be maintained by a central authority.

Wikipedia's digital backbone is similar to the highly protected and centralized databases that governments or banks or insurance companies

keep today. Control of centralized databases rests with their owners, including the management of updates, access and protecting against cyber-threats.The distributed database created by blockchain technology has a fundamentally different digital backbone. This is also the most distinct and important feature of blockchain technology.
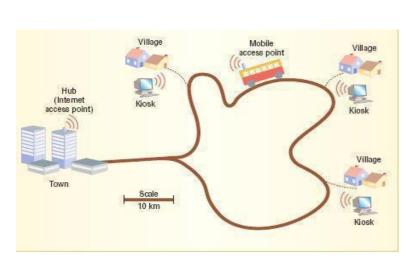
Wikipedia's 'master copy' is edited on a server and all users see the new version. In the case of a blockchain, every node in the network is coming to the same conclusion, each updating the record independently, with the most popular record becoming the de-facto official record in lieu of there being a master copy.

Transactions are broadcast, and every node is creating their own updated version of events.It is this difference that makes blockchain technology so useful - It represents an innovation in information registration and distribution that eliminates the need for a trusted party to facilitate digital relationships.

Prathamesh Karambe
TE IT

Daknet

Nowadays it is very easy to establish communication from one part of the world to other. Despite this even now in remote areas villagers travel to talk to family members or to get forms which citizens in-developed countries an call up on a computer in a matter of seconds.

The government tries to give telephone connection in very village in the mistaken belief that ordinary telephone is the cheapest way to provide connectivity. But the recent advancements in wireless technology make running a copper wire to an analog telephone much more expensive than the broadband wireless Internet connectivity.

Daknet, an ad hoc network uses wireless technology to provide digital connectivity. Daknet takes advantages of the existing transportation and communication infrastructure to provide digital connectivity. Daknet whose name derives from the Hindi word "Dak" for postal combines a physical means of transportation with wireless data transfer to extend the internet connectivity that a uplink, a cyber café or post office provides.

Real time communications need large capital investment and hence high level of user adoption to receiver costs. The average villager cannot even afford a personnel communications device such as a telephone or computer. To recover cost, users must share the communication infrastructure. Real time aspect of telephony can also be a disadvantage. Studies show that the current market for successful rural Information and Communication Technology (ICT) services does not appear to rely on real-time connectivity, but rather on affordability and basic interactivity.

The poor not only need digital services, but they are willing and able to pay for them to offset the much higher costs of poor transportation, unfair pricing, and corruption. It is useful to consider non real-time

infrastructures and applications such as voice mail, e-mail, and electronic bulletin boards.

Technologies like store- and forward or asynchronous modes of communication can be significantly lower in cost and do not necessarily sacrifice the functionality required to deliver valuable user services. In addition to non real-time applications such as e-mail and voice messaging , providers can use asynchronous modes of communication to create local information repositories that community members can add to and query.

Wireless Catalyst

Advances in the IEEE 802 standards have led to huge commercial success and low pricing for broadband networks. These techniques can provide broadband access to even the most remote areas at low price. Important considerations in a WLAN are

Security: In a WLAN, access is not limited to the wired PCs but it is also open to all the wireless network devices, making it for a hacker to easily breach the security of that network.

Reach: WLAN should have optimum coverage and performance for mobile users to seamlessly roam in the wireless network

Interference: Minimize the interference and obstruction by designing the wireless network with proper placement of wireless devices.

Interoperability: Choose a wireless technology standard that would make the WLAN a truly interoperable network with devices from different vendors integrated into the same.

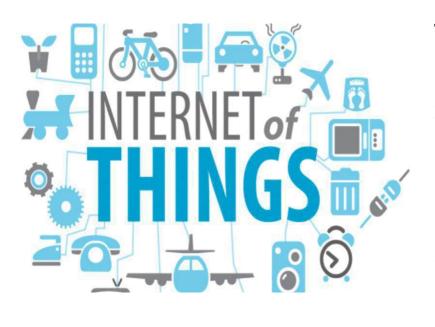Reliability: WLAN should provide reliable network connection in the enterprise network.

Manageability: A manageable WLAN allows network administrators to manage, make changes and troubleshoot problems with fewer hassles. Wireless data networks based on the IEEE 802.11 or wifi standard are perhaps the most promising of the wireless technologies. Features of wifi include ease of setup, use and maintenance, relatively high bandwidth; and relatively low cost for both users and providers.

Daknet combines physical means of transportation with wireless data transfer to extend the internet connectivity. In this innovative vehicle mounted access points using 802.11b based technology to provide broadband, asynchronous, store and forward connectivity in rural areas.

Even local entrepreneurs currently are using DakNet connections to make e-services like e-mail and voice mail available to residents in rural villages. Daknet concept has helped many more initiatives in India like the Bhoomi initiative. Bhoomi, an initiative to computerize land records. Daknet helps on this a lot. A detailed article on Daknet and other initiatives which has enabled digital connectivity in remote areas through wireless networks is available here.

Yash Meghani
SE IT

Internet Of Things

The **Internet of Things** (**IoT**) is the network of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these objects to connect and exchange data. Each thing is uniquely identifiable through its embedded computing system but is able to inter-operate within the existing Internet infrastructure.

The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. When IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyber-physical systems, which also encompasses technologies such as smart grids, virtual power plants, smart homes, intelligent transportation and smart cities.

The applications for internet connected devices are extensive. Multiple categorizations have been suggested, most of which agree on a separation between consumer, enterprise (business), and infrastructure applications. George Osborne, the former British Chancellor of the Exchequer, posited that the Internet of things is the next stage of the information revolution

and referenced the inter-connectivity of everything from urban transport to medical devices to household appliances.

The ability to network embedded devices with limited CPU, memory and power resources means that IoT finds applications in nearly every field.Such systems could be in charge of collecting information in settings ranging from natural ecosystems to buildings and factories, thereby finding applications in fields of environmental sensing and urban planning.

What is the scope of IoT?

Internet of Things can connect devices embedded in various systems to the internet. When devices/objects can represent themselves digitally, they can be controlled from anywhere. The connectivity then helps us capture more data from more places, ensuring more ways of increasing efficiency and improving safety and IoT security.

IoT is a transformational force that can help companies improve performance through IoT analytics and **IoT Security** to deliver better results. Businesses in the utilities, oil & gas, insurance, manufacturing, transportation, infrastructure and retail sectors can reap the benefits of IoT by making more informed decisions, aided by the torrent of interactional and transactional data at their disposal.

Atulkumar Upadhyay
TE IT

"Phree" - Worlds first Amazing Smart-Pen !!

Tantradhnyan.com

Hey there viewers I am here again to take you all to a very amazing and interesting technology called PHREE - Worlds first 3D Laser Smart pen!

Have you ever thought to interact with your device without touching it ??

What if you write on any surface near you and the resulting text will be displayed on your device? Isn't this an amazing idea?
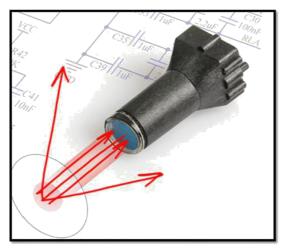
Yes ! This is possible using Phree ! using it you can write on any surface,receive calls and send texts , Lets have a look about this amazing invention in details.

Introduction:-

Phree is a 3D laser smart pen that lets you write on any surface created by OTM technologies.This device allows you to write on any surface showing your writing in real time on your smartphone,tablet,or PC screen. If you habit of jotting down anytime, anywhere, Phree is the smartpen for you . Phree smartpen is a result of over a decade of handwork and passion of Gilad Lederer (Co-founder of OTM Technologies and his passionate team).

Technology used :-

Phree smart pen uses patented technology called Optical Translation Measurement (OTM) that allows the smart pen to capture data to any app through Bluetooth to any Bluetooth enabled device.It uses a 3D Laser interfernometer. The relative motion of a nearby surface is tracked by this meter by measuring the interference signal between a laser beam projected on the surface and reflection from it.This System optically extracts the hand motion signals while writing and between strokes.

The signal processing algorithms developed by OTM then translate the data collected by smart pen (Phree) sensor into X-Y-Z motion data. Phree understands the motion of the writers hand in a similar way human eye does i.e three dimensional. The sensor of the smart pen then tracks both the strokes on the surface and space between strokes as your hand moves.These motions are then recorded and sent to your smartphone, tablet which you can see in real time or later what ever is connected with smart pen.The Smart pen properly integrates with Android , iOS , Windows OS X and Linux it supports most third party apps on Android , OS X and windows.

Features and Uses of Phree Smart Pen :

Apart from just taking notes, you can receive, write and send text messages using device mini display.It also functions as a headset, so you can also receive calls using this device,which makes it more like Universal device.

Important features and specs:-

The Price of this Smart pen is speculated to be at $199 (INR 12,000 APPROX) . The device is Write down important notes and numbers anywhere,anytime without using your cell. Write in your own handwriting.
- Draw emojis of your choice. Send and Receive messages using Mini display.
- Use this device as Bluetooth Handset and mouse.
- Dimensions 142 x 18 x 8.5mm
- Battery life - One week.

Minoli Vartak
TE IT

Real-Time Object detection API using Tensorflow and OpenCV

The amount of visual data in the world today has grown exponentially in the last couple of years and this is largely due to lots of sensors everywhere. Building machine learning models that are capable of localizing and identifying obejcts in a single image remains a core challenge in computer vision. Working to solve this problem has ignited my interest into the field.

As a path to my quest, I discovered Google just released an object detection API. The API has been trained on Microsoft COCO dataset { A dataset of about 300,000 images of 90 commonly found objects} with different trainable detection models .

Model name	Speed	COCO mAP	Outputs
ssd_mobilenet_v1_coco	fast	21	Boxes
ssd_inception_v2_coco	fast	24	Boxes
rfcn_resnet101_coco	medium	30	Boxes
faster_rcnn_resnet101_coco	medium	32	Boxes
faster_rcnn_inception_resnet_v2_atrous_coco	slow	37	Boxes

different trainable detection models

I started by cloning the Tensorflow object detection repository on github. The API is an open source framework built on tensorflow making it easy to construct, train and deploy object detection models.

For this project [am on windows 10, Anaconda 3, Python 3.6], I was concerned with only the installation part and following the example which included

1) Installing required libraries e.g pillow, lxml etc that comes with installing the latest version of tensorflow using pip(latest version)

2) Downloading the latest version of protobuf compatible with my system for compilation on google protobuf releases

3)Cloning the tensorflow/models folder as a zip file

4)On my Anaconda prompt, ran this command for protobuf compilation without which the example wont work.

```
# From tensorflow/models/research/
protoc object_detection/protos/*.proto --python_out=.
```

Swapnil Mistry
TE IT

The Top 10 Algorithms Every Programmer Should Know About.

The current world is experiencing an enormous upsurge in technological developments. New innovations are being introduced on a day to day basis. The mother of these developments is usually the invention and innovation of classical programs that are totally advanced and manipulate the ongoing technological trends. The success of these programs is, however, the coding and algorithms used to develop such competitive programs. Therefore, for a successful and complete program, the exploitation of a proper and accurate algorithm is a must.

Top 10 algorithms used in programming

1. Hashing

Currently involved in the detection and determination of an appropriate data by key and ID, a Hash lookup is a technique employed. With extended roles in the detection of errors, cache management, cryptography and effective lookup, the hash function maps the appropriate keys to values with precise efficiency. The function can also be used as a unique identifier for certain data sets and its math calculations can enable the creation of non-colliding data values. Normally it is applied in routers for IP address storage.

2. Search Algorithms

The search algorithms may either be applied to the linear data structures or graphical data structures. The linear search algorithms also are known as binary search are used to conduct efficient searches on sorted datasets with a time complexity function of O(log N). The Binary search divides the list into halves until it locates the required item and is normally used for git bisection debugging.Also known as Depth/Breadth First Search, the algorithms for graphical data structures are a graph or tree enabled searching functions that locate required data sets in a traversing-tree model. The BFS is common in search engines, also used to build bots in artificial intelligence as well as locating the shortest paths between two cities.

3. Sort Algorithms

The sort algorithms are usually developed to place data in an organized manner. In QuickSort algorithm, the data components are compared against each other to determine their respective orders. It has the time complexity of O(nLogn) to perform enough comparisons. Radix Sort is, however, a faster technique than Quick Sort as it sorts the elements in a linear model with O(n) time complexity. The simplicity of the algorithm makes it much simpler and faster to carry out sorts. Other sorting algorithms include the merge sort, Bucket sort, and Counting sort.

4. Dynamic Programming Algorithms

Dynamic programming is usually an intelligent problem-solving function that segregates complex
problems into smaller subproblems, solves them then build back into the complex problem with a memory of the smaller results to give the answer to the complex problem. Integrated to memorization that enables storage of memories of the previously solved problems, the subsequent time the same problem appears,
the problem is solved much faster.

5. Link Analysis

Commonly used in networking, link analysis offers the ability to correlate between different entities within a domain which is vital for the search engines. The algorithm uses a graphical representation and a complex matrix that links the similar bases within the domains present. Link analysis is common in the search engines like Google, as well as in the social media platforms such as Facebook, Twitter where extensive searches are carried out.

6. Modulo Arithmetic Algorithms

Many complex cryptographic algorithms are actually based on fairly simple modular arithmetic. In modular arithmetic, the numbers we are dealing with are just integers and the operations used are addition, subtraction, multiplication, and division. The only difference between modular arithmetic and the arithmetic you learned in your primary

school is that in modular arithmetic all operations are performed regarding a positive integer, i.e. the modulus.

Examples:
>Basic and Extended Euclidean
>algorithms Eulera Totient Function
>Modular Exponentiation
>Modular Multiplicative Inverse
>Chinese remainder theorem Introduction
>Chinese remainder theorem and Modulo Inverse Implementation

7. String Matching and Parsing Algorithms

The process of creating matching patterns is always vital in any networking domains and elements. The string matching algorithms are used in scenarios where patterns have to match in a long string or when a validation of a string by parsing over a predefined limitation is required. These matching and passing algorithms are commonly used in web development for URLs

8. Fourier Transform Algorithms

Fourier Transform and Fast Fourier Transform are simple yet very powerful algorithms. They are used for transforming signals from their time domain in\to their frequency domain and vice versa. The whole Digital networking including internet, WiFi, phone, computer, router, satellites, use these algorithms in one way or another to function. These are the must-know algorithms for electronics, computing or telecommunications degree program.

9. Disjoint Sets

Disjoint Sets are data structures that serve as helper structures within an algorithm to represent multiple sets within an individual array, with each item being a member of one of the many sets. Disjoint sets, therefore, represents connected components in graph algorithms as well as segmenting an image.

10. Integer Factorization

The integer factorization algorithm is a mathematical algorithm that provides a stepwise guideline on how to get the prime factors of a composite number. This algorithm solves the complex problems in cryptographic platforms that require factoring large composite integers.

Smita Verma
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Accompanist Electronic Harmonium

An AI based Real Time Follower

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*Abstract__*This paper is about developing an Electronic Harmonium which will identify the Ragas of the vocalist and play the notes which he is singing in Real Time. Raspberry Pi 3 Model B will be used here. Audio processing is needed to calculate the frequency of an audio to find out Notes sung by the vocalist. This system won't just follow the vocalist but also will be able to feel the short gaps taken by vocalist during the concert. For that Machine will first detect the Raga, vocalist is currently singing. Various predefined libraries such as PyAudio, NumPy and Wave. PyAudio has functions through which the input is taken using microphone. From NumPy we will use the FFT function which is used to calculate the frequency of audio from chunks of bytes. The Wave library is used to store the audio from the input signal into various small predefined size of bytes called as chunk. When this bytes are processed using the FFT function of the NumPy library then we get the average frequency of these bytes as output which will be then further used to identify the Ragas and Notes and play the music accordingly.

Keywords: Raspberry pi (Model B); audio packages; FFT.

3. INT RODUCTION

One of the most powerful and important thing in affecting the emotional behavior of an individual is music . It may through listening or signing to music during spare time, while studying during exam time or is stressing oneself after a bad day .Music can also be related to yoga as it helps to achieve mental peace and also keeps our body healthy. However p laying any musical instrument is a serious act. One such instrument is Harmonium. It was introduced in late nineteenth century in India by British. The resonance of Harmonium perfectly matches with the resonance of vocals in Indian classical music. Thus it has very become a very popular accompanying instrument as it can capture Shruti, Meend, Gamak.It plays a central role in Indian Classical

Music, Sufi Music, Bhajans and other varieties of music. The main objective here is to replace the human Harmonium Player with 'ELECTRONIC HARMONIUM PLAYER'.There are instruments in classical music which can be replaced by there Electronic Equivalent Devices. Such as, for Tabla we have 'Taal Tarang', Electronic Tanpura is also available in the market. Both of these Electronic machines can replace their respective original instruments very effectively. But, for Harmonium we don't have such reliable Electronic Machine. So, the basic aim is to make such an Electronic Machine on which Music Practitioner can be dependent on.

11. REFRENCIAL PROCEDURE

Python scientific computing process comes with three modules Nu mPy SciPy Matplotlib. NumPy gives you access to complex arrays and constants which cannot be achieved through basic Python. Various binary operations, statistics operations, logical functions and sorting and searching functions can be done using NumPy. Whereas various linear algebraic, integration, signal processing and Fourier Transform functions can be done using SciPy. The task of quickly visualizing and analyzing of data fro m NumPy arrays can be done using Matplotlib . When we see a signal in the time do main, we cannot tell how many different individual signals are present.

PROPOSED SYSTEM

Technologies Used

The waveform of the Harmonium is similar to square wave thus to obtain that Raspberry Pi (Model B) and PWM (Pulse Width Modulation) technique in it is used which is a technique to modify pulses of the input signal.

1.RASPBERRY PI 3 M ODEL B (Specifications) :

Raspberry Pi system includes an ARM compatible central processing unit. It has on chip GPU. It's CPU speed ranges fro m 690 M Hz to 1.19 GHz. Microcontroller Pi has on board memo ry RAM wh ich is of 1 GB. Ult ra class 10 of 16GB memo ry card is used to store the operating system like Raspbian OS which is installed by NOOB OS . After getting memo ry card, first it has to be formatted. Operating system like Rasbian OS is installed using card reader and then it has been inserted in the card slot of Raspberry Pi. It has between four USB slots, one HDMI port where HDMI to VGA cab le can be attached. It has composite video output, and audio jack connector. Nu mber o f GPIO pins are 40 where other peripheral devices like sensors can be attached.
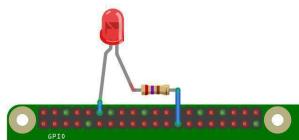

Fig .1.Raspberry Model Pi 3 Model

2 .G.P.I.O.:

GPIO is also referred as General Purpose Input Output. Raspberry Pi has 40 pin GPIO slot. These pins act like a interface between the microcontroller and the outside peripheral devices . The sensors can be attached to it through the breadboard and specific hardware circuit. 26 pins are GPIO p ins and the others pins are power pins and/or ground pins.

B. How GPIO Pins Work

Fig .2.Interfacing LED with GPIO pins.

GPIO pin when used as output pin, above figure shows the interfaces between simple LED. Each pin can be turned on or off. The anode of LED pin is connected to VCC where 3.3 V is output through some low value register to drop the voltage and cathode is being connected to ground pin which is specified and shown in above figure.

Waveform Generation Using PWM

Waveform of Harmonium is a square waveform, we will require to use the Pulse Width Modulation for generating a suitable waveform to produce the voice of Harmonium. PWM is a technique used to control the power output of raspberry pi. The figure 3 shows pattern of signals from the PWM pin of Pi.

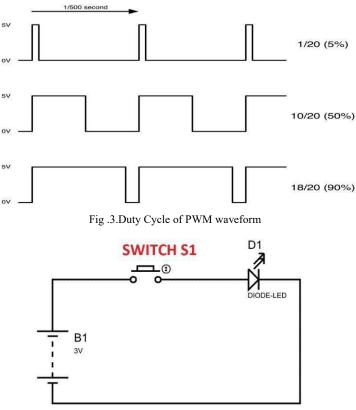Fig .3.Duty Cycle of PWM waveform

Fig .4.Switch Interface with LED

In above figure [4], the LED will remain 'ON' until and unless the switch is open. Duty Cycle is the proportion of time for which the LED is ON. If the switch is closed for half second and open for half second then the LED will glow only in the first half second. Duty cycle can be calculated as follo ws:

Duty Cycle =Turn ON time/ (Turn ON time + Turn OFF time)

Duty Cycle = (0.5/ (0.5+0.5)) = 50%

Accompanist Electronic Harmoniu m

1.SOFTWARE PWM:

In Raspberry 3 there are 2 dedicated pins for PWM but in case when you require more then that then using Software PWM we can use any of the GPIO pins for generating PWM outputs this can be achieved using WiringPi library of Raspberry Pi. It has GPIO access library written in C which
is used Pi. This library has a command-line utility "gpio" which is used to program. Using this reading and wrting on the GPIO pins can possible.

2.HA RDWARE PWM:

This can be achieved using the WiringPi lib rary of Raspberry Pi. It is also called as BCM 2835 library. Hard ware PWM is supported on limited GPIO subset pins by the bcm2835 lib rary. This library provides functions for configuring and controlling PWM output on GPIO pins.

The library has 2 PWM channels that is 0 and 1. Each channel of can be connected to a limited subset of GPIO p ins.

D. PWM Audio Output To Speaker

Two output modes of Pi are HDMI and Headphone jack .The following are two ways to set the audio output that is through Co mmand Line and using raspi-config.

Amixer cset numid = 3 2

And sudo raspi-config

Through raspi-config window we can select whichever output method we want to use. The 3.5mm audio jack is driven by this PWM peripheral which should give the sound similar to Harmon iu m but the audio quality received by this audio jack for speakers is not good and headphones sound bit louder than speaker but not loud enough hence an audio amp lifier here . PAM8403 would be best suited.
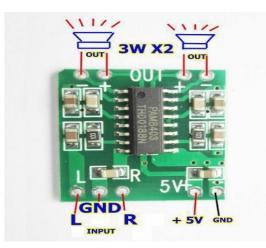

Fig .5.Speaker Amplifier

D. Audio Processing Using Python

To process the audio Python libraries are used such as PyAudio library is used for listening audio from input source and giving desired output. PyAudio uses Stream class for taking inputs from microphone and giving outputs to speaker. The stream class has values such as Rate, Width, Channels, Input, Output (have boolean values).Channels set the number of audio channels. It's value ranges from 1 to
Rate defines the number of Samples collected per second .When the audio is recorded, it is divided into chunk of bytes specified. These chunks are then added to each frames which are then joined together to make a .wav file These .wav file is then read using the Wave package NumPy is then used to perform Fast Fourier Transform on the file and obtain the frequency of each chunk of bytes. The data from the file is read in frames as per it has been saved.

IV.CONCLUSION AND FUTURE SCOPE

After looking at the increasing demand in market as well as need of Electronic Harmon iu m for Riyaz purpose in Indian Classical Music our main aim was to create "Electronic Harmoniu m" which will be played automatically and not manually through Raspberry Pi and Python that will follo w the vocalist in real time. It can act as a filler thus giving vocalistis time to breathe and continue the music even if the vocalistis stop singing. It can be developed in the future in such a way that it can be used for a variety of Musical Instruments. Most distance measures that have worked well in musical process . On the other hand ,many of the indexing methods rely 40 on the properties of a metric. Typke and Walczak-Typke d iscuss indexing techniques . This non-metric distance measures musical interest. Inspired by LSH, it may be worthwhile to exp lore the use of non ff-metric dissimilarity measures which is suited for music retrieval with different indexing methods. Designing a good e ective confidence measure to support raga identification results will be of great impo rtance while building a real -time raga recognition.

REFRENCES

[1] A.K.M Fazlul H., "FFT and Wavelet -Based Feature Extraction for Acoustic Audio Classification." Department of EXT C, Daffodil International University.

[2] J.Glover,Victor Lazzarani and J. T imoney, "Python For Audio Signal Processing" The Sound and Digital Music Research Group, 2011.

[3] Ms. PadmaSundari, "Music Information Retrieval: Raga Identification using Machine Learning" Post graduate report in Industrial Mathematics and Scientific Computing dept ., IIT Madras, May 2016.
Mr. Yogesh P. Pingle, "Predicting Shrutis in Harmonium using Temporal Mining" in International Journal of Education and Research, ISSN :2248-9622 National Conference on Emerging T rends,March2012

AC Controlling using IOT

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Abstract— **The principle objective of this paper is to perceive the wireless connectivity of the A/C's present in a theater room. A scheduling method of air-conditioner is proposed for reducing power and saving electricity. The proposed method is designed to determine the temperatures in a multiplex theatre using sensors.**

Keywords— wireless connectivity; air-conditioner; power saving;

Introduction

The ever growing need for technology has increased the demand for Internet of Things (IOT) based applications. This revolutionary idea has clubbed together many technologies including embedded system, wireless networks aiming to exchange multiple information and communicate between different sensing systems connected to each other via internet. This technology opens a new way to make interaction with multiple devices and very suitable to wireless sensor networking task (WSN).

This brief idea enables us to think about various applications such as designing an automated system for cinema halls and controlling the same via different devices or sources. Also further the same view can be extended to control various appliances in real time world.This brief idea enables us to think about the project of automated controlling system in cinemas and lets traverse through all the facts on the same:
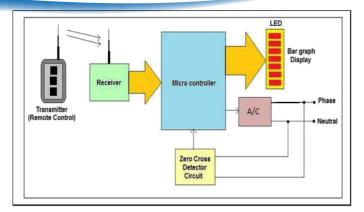
Problem Statement

The current problem faced is the a/c system's, consumes more power and works manually including labour.The project summarized air-conditioning energy saving strategy and automation by replacing or modifying the air-conditioning system at present and integrating the original circuit using IoT application.

Existing System

We know that the existing system of AC around us is normal cooling followed by some senses and managing its system accordingly. The system present right now only cools at the given temperature manually and just drops down the temperature by one or two which is not much beneficial causing the loss of power and many other related facts. Moreover, there are chance that the system gets exhausted if runs for a longer time.

Proposed Solution

The changes that would be done in the existing system will be that it can change the temperature as per the requirement and needs of people also considering the resonance frequency given out by a human body which is the most important part of generalizing this idea causing harmless cooling around and making all fell relax. The basic sensors that can be used as the proposed solution can be such as

'Proximity Sensors', 'Thermal Sensors', 'Temperature and pressure Sensors' etc.

FIG 1 BLOCK DIAGRAM

Transmitter :

The control for all the air conditioners present in the theatre room would be given to the transmitter (Remote Control).
The basic application of the transmitter is to transmit the required information according to the requirement of the room.

Receiver:

The receiver will receive the message signals from the transmitter which will be embedded on the micro controller to decode the message signals and pass it to the micro controller.

Microcontroller:

The microcontroller is a complete microprocessor system consisting of microprocessor and limited amount of RAM, ROM and I/O. This system is built on a single integrated circuit. Building a complete microprocessor system on a single chip substantially reduces the cost of building simple products which use microprocessor power to implement their function.

TABLE 1. CURRENT EXISTING SYSTEM

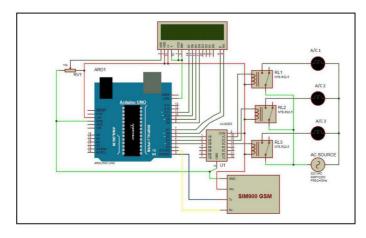| FLOOR	SCREEN NO.	CAPACITY	COMPANY
GND	3	22 TONES (2 AC)	BLUESTAR
1	4,5	8.75 TONES (2 AC)	BLUESTAR
2	2	16 TONES (2 AC)	BLUESTAR
3	1	16 TONES (2 AC)	BLUESTAR

FIG. 2. AUTOMATED CIRCUIT DIAGRAM

SCOPE

The application can reduce the manual authentication of turning on and off the AC. Considering the day to day life example as one forget to switch off the system at his/her place and goes on for work leaving it on and suddenly you realize that you haven't turned off the system so, this can be beneficial making use of this develop application on a good track. The idea can also evenly extended by switching to all electronic devices such as fans, light, opening of your home door without manual work leads to the ideas of the ever growing technology known as IOT(Internet Of Things).

Conclusion

Basically, the idea is for the present need of day to day life. The main aim of this paper is to schedule the air conditioning systems and automation for reducing the power loss and manual efforts of maintaining the temperature in theaters.

REFERENCE

[1] Hyung-Chul Jo,Jaehee Lee,Sung-Kwan Joo "Scheduling of air-conditioner using occupancy prediction in a smart home/building environment" in: Consumer Electronics (ICCE), 2014 IEEE International Conference on :- 10-13 Jan. 2014

[2] Abhinandan Majumdar, Zhiru Zhang, David H. Albonesi, "Characterizing the Benefits and Limitations of Smart Building Meeting Room Scheduling" in : Cybe - Physical Systems (ICCPS), 2016 ACM/IEEE 7th International Conference on : 11-14 April 2016

[3] An Yanping,Qian Ping. Air-Conditioning Energy-Saving Control Strategy at Subway Station Based on MAS Evolutionary Algorithm in: Intelligent Computation Technology and Automation (ICICTA), 2015 8th International Conference on : 14-15 June 2015

[4] Tao Zheng, Yajuan Qin, Deyun Gao, Junqi Duan, Hongke Zhang. A practical deployment of Intelligent Building Wireless Sensor Network for environmental monitoring and air-conditioning control in: Network Infrastructure and Digital Content, 2010 2nd IEEE International Conference on: 24-26 Sept. 2010

Smart Assistant device Byakugan for Blind People

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Abstract— **Byakugan is a device for blind and visually impaired people. It works on the simple principle of recognizing the surrounding objects and then interpreting them accurately and giving output in the form of speech according to the given instructions from the user. This device will help those people to extract significant information for navigation and recognition in their daily life. Leading them to actually live life normally. This was once a fictional imagination but due to recent vast development in area of Computer vision technology, neural networks and image synthesis it has become rather easy to actually implement this, and helps to develop an economical product that allows them to interact with the world like never before. This paper will discuss on implementation of this idea, give an approach on problems and challenges that we came across and some solution. It is a blend of many exquisite technologies integrated together in a marvellous way in one device to achieve the sense that was lost.**

Index Terms—**Computer Vision, Image Processing, Image Synthesis, Neural Network, Convolution model, Speech synthesis, Blind, Pattern recognition.**

Introduction

We have seen in Sci-Fi movies how Iron man's suit has such an awesome detector for the surrounding and how he can detect everyone and get their identification. Or how in Avatar: The last air bender's earth bender Touph can sense everything through her feet which senses vibrations and how even through being blind she could see everything. And thus, that was our motivation for this project. To help people listen what others could see.

Recent advancement in Computer Vision and Neural networks has made this story or Science Fiction a reality. Something we can actually do and implement, a great way to help people with technology. This is implemented on the Open Source platform such as Linux using Python and OpenCV libraries. Integrating them to make a wearable device. The fast development and advancement in these sectors helps to interconnect all these modules, helping us to achieve a reliable, economical and accurate device for the blind and visually impaired people.

Of millions of people in the world there are many who are visually impaired. This number is increasing rapidly because of baby born abnormal (out of age), pollution effect or other types of possibilities. Since ages with the help of guide sticks or dogs, merely by touching, smelling, hearing, visually impaired people would perceive the environment and accordingly that helped them navigate, avoid obstacles, sense and discern object by shape and material.

However, it is beyond there capability to be normal without any issues. Or to acquire essential information like text or normal objects. Braille note is not accessible everywhere. Making it difficult to acquire knowledge of the surrounding and accordingly estimate the proper decision.

For example, the major problem is text based information, these information serves as a great asset as a comprehensive and understandable indicator, playing a very crucial role in navigations and recognition in the daily life. It becomes difficult to access these information in an unfamiliar environment. However, recent advancement in Image processing and machine learning has helped us in doing the impossible. Which can change their lives and they can interact with the world like never before. This blind assistant combines the computer vision technology with the other product like OCR, GPS systems, with that integrating various algorithms in our system for face recognition, object classification etc can be achieved by deep learning, pattern recognition, prediction techniques. Thus, making the system to predict the environment and thus producing speech as the output for each classified object.

The basic approach is to sense the surrounding objects and predict the object with utmost accuracy and thus give output in the form of speech. So, this paper aims to revive the work of all types of process. Generate an efficient algorithm. For this, we have tried to divide all the modules in simple form and then integrated all of these. Our modules are divided as the face recognition, object recognitions and each have their own training and testing data set. Also deriving a deep learning system and increasing the accuracy rate of the OCR system we have used, and then converting them in the form of text and then speech, this will help understand the important law of enforcements and introduces new applicable systems throughout the world.

This device is not bigger than the cell phone but probably may be as small as hairpin, earing or button etc, anything that can be worn. This device gives us profundity on deep learning and neural networks concept. Just like our eyes it helps in perceiving information, in fact it helps in grasping information better than other senses.

This integrates the information from learned and trained data and predicts accordingly, this helps in substantial and insubstantial world to interact and make it one so that the reality can be experienced in an amazing way. Like making a Jarvis of our own which can recognise surrounding and speak accordingly, giving a supernatural power, which can be enhanced and make the future beautiful like never before.

Literature review

This project focuses on making everything that is visible to be audible. For which we will be using all the knowledge of computer vision, image processing and pattern recognition. The aim is to make a portable interactive smart device which can interpret everything in the surrounding environment.

The camera is our sensing device, which helps in capturing all the data of environment. That will go to our processor, which has all the loaded software and environments for our device to function, the output of the processed input will be by speakers or smart phones. Using the knowledge of machine learning and pattern reorganization, we will have our data set that helps in processing the results. Using image synthesis, we distinguish the images from the surrounding.

The main topic of this research totally focuses recent development in computer vision and deep learning making it feasible to assists these individuals by developing products that combine computer vision technology with other existing products such as OCR systems.

Assistive Text Reading From natural scenes for blind people. Text information plays a significant role in our daily lives for navigation and recognition. It is very difficult for blind people to access this valuable information in unfamiliar environment.

Information and assisted system for blind people. The system presented in this paper aims to highlights the user's device integrating it with device and technology already used by user as their own smartphones.

Modelling

Blind assistant is the blend of computer vision, neural networks, gesture recognition and human digital interaction. It is made in the form of portable device, helping blind to interact with the real world is made as a smart speck which can be worn, it is connected with the micro controller used to process and synthesis the data thus giving us the output in the form of voice.

Components used: -

a)   Camera

b)   Raspberry Pi
c)   Speaker/ Headphones

This device uses embedded technology, we connect the camera to the specks which will help in recognizing the objects and then, that is processed in Raspberry Pi, this will make the contours of every object and the biggest contour will be detected which will be spoken out with the help of speakers or headphones. The data will be taken from the pre-defined data set as well as through internet.

The basic principal it works on is to first capture the surrounding objects, make a basic contour of them. Then detect the contours and process them in raspberry pi using tensorflow and deep learning we will extract the knowledge from the data, predict the object with the help of pattern recognition and process it in the form of text. This textual data can thus be synthesised to speech thus helping the blind to navigate around and recognise everything.

a)   First capturing object from the surrounding is necessary. We use camera component to capture these and then we pre-process the data and synthesise it to make it in the form of binary image. As the binary image is very easy to extract and recognise the data.

b)   For making it in the binary we will first grayscale the image. After grey scaling we will convert the image to edge form, this will help us detecting object minutely. Then we blur it, there are various algorithms used, for that we have used gaussian blur image algorithm. Then thresholding is done. This process of pre-processing the image helps us converting the image in the binary form for more accuracy.

c)   After this we can draw contours. Contours are basically, closed curves around the object. This closed curve is our Region of Interest in the process. We need to detect and extract our ROI so that we can properly extract and search in our dataset.

d)   After obtaining our region of interest it is very important to detect it. For that we will use Convolution Neural Networks deep learning and then predict our image. We will make our training set and train them so that they can recognise every object of that type.

e)   After training we will have our testing data, this data will help us in testing.
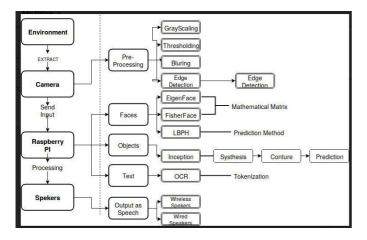
f)   In this feature extraction is carried on followed by finding the feature vector to all the objects.

g)   Then those vectors are classified using the prediction API and that is converted to text form.

h)   The text is then synthesised and phoneme translation occurs, basically the near pronunciation of the text. For e.g. Xerox is converted to Zi@roks. Then synthesizer helps to convert text to associated pitch contours then that data is used to compare from the diaphone voices and then assembled to associated and sound envelope.

i)   Thus, the objects are recognised and given in the form of speech helping the user to detect the surrounding accurately.

j) This will happen with the help of voice instructions (commands) given by the user to trigger different functions. Thus, is the basic of the assistive device for blind.

FlowChart

Optical Character Recognizer(OCR)

OCR is a system used to extract text from the image

These is the essential module as text provides the basic knowledge from reading to navigation. This assistant helps the blind and visually impaired people to do so and interact with the world easily.

We have used tesseract which is the best OCR with lese latency present in the market

This OCR engine, works on the principal of breaking the image is the form of pixels and then integrating them with the best probability of prediction.

First the image is taken from the environment, and scanned in the TIF format which is high quality image and then it is converted to pixel form.

We can use two functions in this, first is matrix system. The matrix system converts all the pixels into matrix form and accordingly detect using the value of matrix

The other function is feature extraction method. This is more accurate and is mostly used. In this function, the feature of the image is extracted. Here it compares the image breaking down and comparing pieces. This breakdown of image is called features. Then feature matching is done.

After that it tries to detect all the white and black pixels and also calculate the distance.

A long ribbon of printed character appears that is tokenized and compared to other tokens. Character with smallest distance is compared and then String of probability is found. Thus, a text is printed from the image.

Text to speech:

It is a Speech Synthesis mark-up language (SSML).

The text is converted to the nearest Phoneme translation, e.g. Xerox as Zi@roks.

Then that is given its prosody data e.g. z'i@roks. This data is necessary to know where the stress has to be produced.

There are two synthesiser espeak NG synthesizer and klatt synthesiser.

The espeak NG synthesizer is an additive type. Where all the speech is synthesised additively while as klatt is a subtractive synthesiser it disintegrates and then compose them.

Then text is converted to associated pitch contour saves the file and given to the MBROLA diaphone voice, that is made as spectrum and sound envelope.

Face Recognition

We will create a database with multiple faces.

Detect the face in database and use that database to train face recognizer.

There are three algorithms for face recognizer. Eigenfaces, Fisher face and LBHP face recognizer.

Eigenfaces and Fisher faces are mathematical models who work in the form of matrix where as in LBPH face recognizer we try and predict the faces comparing with the data set.

12. Convolution neural network

We are using CNN as our deep learning model. It is a model which is best for images.

In this model, the images are broken into pieces and those are called features. Each one is given a +1 and -1 value.

The math behind convolution is easy, to calculate the match of a feature, simply multiply each pixel in feature by the value of corresponding pixel.

Then taking the average by adding all features and dividing them by total number of pixel.

If both the pixels are white i.e. 1 then its multiplication turns out 1.

If both are black i.e -1 then value becomes 1 again.

Either way, every matching pixel results in 1. Similarly, any mismatch is a -1.

Pooling is shrinking of larger images preventing the important information in them. Then the process of Rectified linear units- whenever a negative number occurs, swap it out with a zero. This helps the math to be strong.

This all process is done recursively till we get a small image and they are filtered and shrunken and thus a fully connected layer occurs. Thus, if you have a problem like finding patterns in image then CNN is the best type of model.

13. Challenges

Recognizing and filtering the surrounding objects is the biggest challenge here. As we need proper accuracy or the main objective of this device is lost.

We need to make the hardware component compact and durable to handle.

The processing needs to be fast and less latency is required as a person is totally dependent on this device.

14. Application

Bykaugan has a lot of applications like: -

1. The main moto of this device is that it helps the blind and visually impaired to find obstacles and recognise them easily. All the obstacles in the surrounding are detected, recognised and then spoken, helping the blind to understand what are the surrounding.

2. It helps as an assistant to read text. Text in our daily life is the most essential part of source to gain knowledge. Not everywhere braille notes are present and it is not that accessible. Using this device helps to read every text in the surrounding.

3. Helping in navigation. This is also a great accomplishment attained in this device. We can use GPS, that will help us in navigating through different places.

4. Face recognition. Know your friends, family and colleagues. This device will help in recognizing everyone.

5. A great personal assistant. Helps us to be updated about the surrounding and the environment and thus helping to acquire great decision making.

6. To read the product label and other sign boards easily helping to recognise easily. This can also help people in banks and other organisation to do their daily work without anyone's assistance.

7. To perform the daily life activity with ease without any assistance of someone or stick. A free life that was just a fictional imagination can now be the reality.

15. Conclusion

Thus Byakugan- hear what they see is a device which helps a person with visual impairments and blinds to hear everything that others can see. A smart assistive speck that captures the surrounding object data, pre-synthesise it and then recognises it. After the processing, it simply converts it in the form of text and that is then converted to the speech. The user will ultimately get the speech as the output and he has nothing to do with the processes.

The processing of the data is a bit complex. Firstly, the image will be having lot of noises and that has to be removed and contours had to be made on it. The contour with the biggest size is our main object and that is synthesised and converted to binary form. Then it becomes easy for the processor to process. The deep learning and pattern recognition helps in predicting that object accurately. After this the simple text is just spoken. This device is very much helpful and essential. A thing that was just an imagination in fiction is actually now a reality because of vast development in the computer vision technology and deep learning. This can actually help the people to not be a victim of fraud. They can take their own decision with this interpretation of the surrounding and thus without anyone's assistance and lead forward to a life they desired.

APPENDIX A

FUTURE.

a) To make it more compact device.
b) Increase accuracy and decrease latency time.
c) Add navigation feature using GPS
d) Add a personal assistant
e) Improve object recognition
f) Add the different language translation for different regions.

Acknowledgment

References

Assistive blind text reader using OCR in year 1222 by yang yui.
####J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68–73.
I. S. Jacobs and C. P. Bean, "Fine particles, thin films and exchange anisotropy," in Magnetism, vol. III, G. T. Redo and H. Suhl, Eds. New York: Academic, 1963, pp. 271–350

List Of Certified Students

SE-IT

No	Name of Student	Certification Name
1	Sanchitsagar Singh	OCPJP
2	Ravikant Sharma	OCPJP

TE-IT

No	Name of Student	Certificaton Name
1	Khushboo S. Memon	OCPJP Android Programming
2	Ritesh P. Jambhavdekar	Database Fundamentals(SQL) OCJP
3	Richa D. Solanki	OCPJP Web Designing
4	Mahima S. Yande	Android Certification
5	Sweety M. Patil	Android Certification
6	Yash A. Shah	Android Certification

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