CTC(T&IT),CRPF

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Never stop learning, Because life never stop Teaching

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"Science is the great antidote to the poison of enthusiasm and superstition."

Adam Smith

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READER'S CENTER

How Do Fuel Cell Electric Vehicles Work Using Hydrogen?

Emergence of New Computer Technologies

Modern model printing

Wi-Fi Sensing: Applications and Challenges



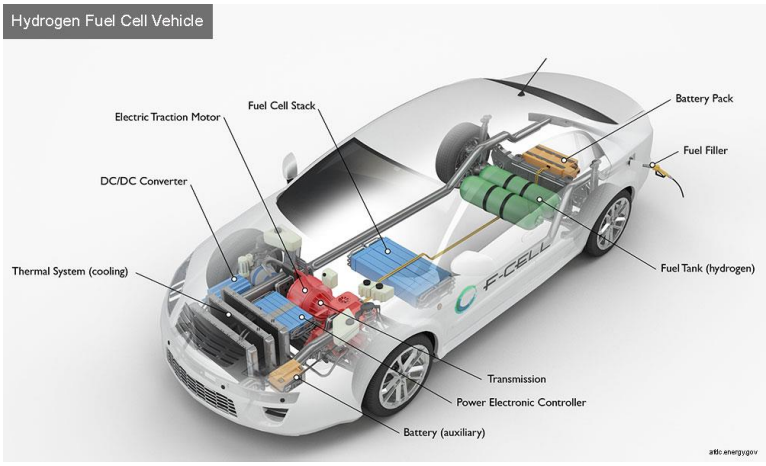
Mass Tree Plantation Drive By Shri. Harjinder Singh ,DIGP and All Staff of CTC(T&IT) ,CRPF,Ranchi.



Paying Homage to the Martyrs on the occasion of CRPF Raising Day

How Do Fuel Cell Electric Vehicles Work Using Hydrogen?

Like all-electric vehicles, fuel cell electric vehicles (FCEVs) use electricity to power an electric motor. In contrast to other electric vehicles, FCEVs produce electricity using a fuel cell powered by hydrogen, rather than drawing electricity from only a battery. During the vehicle design process, the vehicle manufacturer defines the power of the vehicle by the size of the electric motor(s) that receives electric power from the appropriately sized fuel cell and battery combination. Although automakers could design an FCEV with plug-in capabilities to charge the battery, most FCEVs today use the battery for recapturing braking energy, providing extra power during short acceleration events, and to smooth out the power delivered from the fuel cell with the option to idle or turn off the fuel cell during low power needs. The amount of energy stored onboard is determined by the size of the hydrogen fuel tank. This is different from an all-electric vehicle, where the amount of power and energy available are both closely related to the battery's size. Learn more about fuel cell electric vehicles.



High-res image

Key Components of a Hydrogen Fuel Cell Electric Car

Battery (auxiliary): In an electric drive vehicle, the low-voltage auxiliary battery provides electricity to start the car before the traction battery is engaged; it also powers vehicle accessories.

Battery pack: This high-voltage battery stores energy generated from regenerative braking and provides supplemental power to the electric traction motor.

DC/DC converter: This device converts higher-voltage DC power from the traction battery pack to the lower-voltage DC power needed to run vehicle accessories and recharge the auxiliary battery.

Electric traction motor (FCEV): Using power from the fuel cell and the traction battery pack, this motor drives the vehicle's wheels. Some vehicles use motor generators that perform both the drive and regeneration functions.

Fuel cell stack: An assembly of individual membrane electrodes that use hydrogen and oxygen to produce electricity.

Fuel filler: A nozzle from a fuel dispenser attaches to the receptacle on the vehicle to fill the tank.

Fuel tank (hydrogen): Stores hydrogen gas onboard the vehicle until it's needed by the fuel cell.

Power electronics controller (FCEV): This unit manages the flow of electrical energy delivered by the fuel cell and the traction battery, controlling the speed of the electric traction motor and the torque it produces.

Thermal system (cooling) - (FCEV): This system maintains a proper operating temperature range of the fuel cell, electric motor, power electronics, and other components.

Transmission (electric): The transmission transfers mechanical power from the electric traction motor to drive the wheels.

SI/C Askar V.H

Emergence of New Computer Technologies



Keywords: -Computer, Technology, Internet, ICT, New trends

Introduction:-

The computer has been widely deployed within the last decade to almost every conceivable sector of human endeavour. Improvement to computing processes, applications and tools are developed regularly as well as new products and services. This write up will offer information on evolving trends. A useful metric for the rate of technological change is the average period during which speed or capacity doubles .

Definitions:-

This succinct definition captures the context in which we use the word., creating the systems and applications software required for digital ICT.

"Capturing technologies to collect and convert information to digital input. These produced the keyboard, mice, joystick, touch-screens, voice recognition systems, bar code scanners, image scanners and palm-size camcorders. Storage technologies to store and retrieve information in digital form. These led to magnetic tapes, floppy and hard disks, RAM disks, optical disks such as CD-ROMs/DVD, smart cards, memory sticks, etc.

Processing technologies, creating the systems and applications software required for digital ICT.

Some of the popular offshoots or by-products of the Internet include:-

The World Wide Web or WWW – a collection of linked electronic files\documents offering vast information on any subject, residing on numerous accessible servers. Indexing services and Search Engines enhance their usage.

- The WWW is itself based on the hypertext and file transfer protocols (http and ftp).

- E-mail or electronic mail, which has been estimated to have a superiority ratio of 240:1 to its fax predecessor. E-mail has almost totally taken over electronic document transmission and relegated the delivery of written or bulk printed packages to the conventional post-office.
- Electronic-chat and messaging, this system allows remote users to participate in real-time textual, graphic and voice conversations. Such free services offered by multinationals such as Yahoo!, AOL, MSN, Google, etc. (who derive the substantial portion of their revenue from advertisers and other subscribers services) has opened up a new vista in modern communications. Newsgroups or electronic bulletin boards have developed as another method of communication on the Internet. There are thousands of different newsgroups, each dedicated to the discussion of a different topic. Each newsgroup has its own designated subject area that people in that group are interested in discussing. Then, within each group "threads" or conversations about an aspect of the topic will emerge. Members in the newsgroups communicate by "posting" (mailing) messages to the newsgroup.
- Internet-telephony based on Voice over Internet Protocol (VoIP). This allows making telephone calls over the Internet; it effectively transforms expensive international calls into almost cheap local calls
- Interactive Content Delivery Services; these have been harnessed to develop new paradigms such as e-learning, e-governance, e-commerce, e-dating, e-conferencing, etc. These online services allow people to offer and receive distant education, business transactions, meetings, news and reports, medical and other consultations, etc.

Security Issues:-



Hookers or spyware developers create spy software and crawlers that automatically perform tasks and operations without the computer owners' permission; such as sending out information, displaying advertising or downloading data. Virus and worm writers produce destructive and self-replicating software that cram, slow down and eventually crash computer systems. Given all these, security is a big issue in computing with several firms and government agencies dedicated to countering the 'bad folks.'

HC/RO S.K. Mohanty

Modern model printing

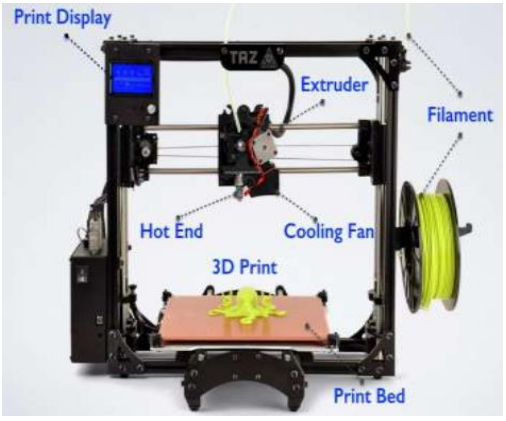
3D Printing is a process for making a physical object from a three dimensional Digital model, typically by laying down many successive thin layers of a material.
It brings a digital object (its CAD representation) into its physical form by adding layer by layer of material. It is also Known as Additive Manufacturing.(Additive process ,where successive layers of material are laid down in different shapes.)

Types Of 3D Scanner

Photogrammetry is the science and technology of obtaining reliable information about physical objects and the environment through the process of recording, measuring and interpreting photographic images and patterns of electromagnetic radiant imagery and other phenomena.

Light Based Scanning -

1. Structured Light Scanner
2. Laser Scanning



Components Of 3D Printer:-

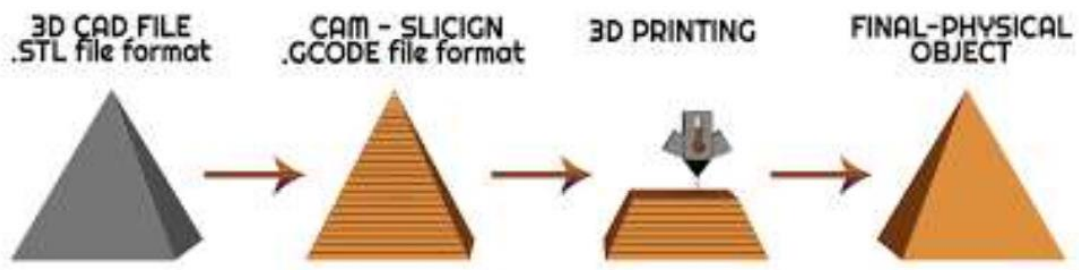
Z RESOLUTION– LAYER THICKNESS

BUILD AREA

FILAMENT DIAMETER
HOT END
NOZZLE
EXTRUDER
COOLING FAN
HEATING BAD
LCD DISPLAY
MULTIPLE EXTRUDERS

Working of 3D Printing:-

The working of 3D Printing are divided into certain steps.



2.design creation

3.STL File Format

4 slicing

5 printing

6. Removal/ Finishing

Through the printer produced resolution is sufficient for many applications, printing a slightly oversized version of the desire object in standard resolution and then removing material with a higher resolution subtractive process can achieve greater precision. Supports are removable or dissolvable upon completion of the print, and are used to support overhanging feature during construction.

Software required by 3D Printing:-

To Turn Our ideas into 3D printable files We need some 3D Modelling Software, Take a look on the Best 3D design and modelling software:-

Simplify3D
Slicer
Tinker cad
Sketch UP Free
Free CAD

Limitations:-

3D Printing Limitations at a Glance:
Health Hazards
Eco-Unfriendly
High Energy Consumption
Unemployment
Printers are not large enough

Applications:-

Medical Procedures
Advances In Research
Product Prototyping
Historic Preservation
Architectural Engineering
Food Industry
Automotive
Accessories



3D Heart Model

SI/T N.K Tripathi

Wi-Fi Sensing: Applications and Challenges

Abstract: Wi-Fi technology has strong potentials in indoor and outdoor sensing applications, it has several important features which makes it an appealing option compared to other sensing technologies. This paper presents a survey on different applications of Wi-Fi based sensing systems such as elderly people monitoring, activity classification, gesture recognition, people counting, through the wall sensing, behind the corner sensing, and many other applications. The challenges and interesting future directions are also highlighted.

Keywords: Wi-Fi People localization; elderly people monitoring; activity classification; gesture recognition; people counting; through the wall sensing;

Introduction

The discovery of the wireless wave by Hertz [1] has opened the doors for many technological revolutions. Most aspects of our modern life have been affected by this important discovery. Today, 130 years after Hertz's discovery, there is a wide range of applications of the wireless waves, such as activity detection, gesture recognition, and elderly people monitoring. Future access points will be also able to recognise gestures and take commands, analyse and classify different activities of people inside and outside the house, monitor the health conditions of elderly people by monitoring their breath, fall, etc. the applications of using the Wi-Fi signals. The range of applications is not limited to indoor applications but also include outdoor areas.

Applications

- Health Monitoring
- Activity Classification
- Gesture Recognition
- People Counting
- Through the Wall Sensing
- Emotion Recognition
- Attention Monitoring
- Keystrokes Recognition

- Drawing in the Air
- Imaging
- Speed Estimation
- Sleep Detection
- Traffic Monitoring
- Smoking Detection
- Metal Detection
- Sign Language Recognition
- Humidity Estimation
- Wheat Moisture Detection
- Fruit Ripeness Detection



Fig 1. Different applications of Wi-Fi based sensing systems.

Video-based sensing systems have limitations in Non-Line-Of-Sight (NLOS) environments, in the dark, through smoke or walls; they are also computationally intensive and have lower localisation accuracy.

Wi-Fi does not have the limitations of video-based systems; furthermore, it has higher availability and longer range than other signal-based systems such as Ultra-Wideband (UWB). The possibility to provide people tracking without transmitting any additional signal, nor require co- operative objects as other signal-based systems, offers major opportunities.

WiFi People and Crowd Counting

The scanner can be used to count people or estimate the size of a crowd. The data does not provide 100% accuracy (not everyone has a Smartphone or WIFI enabled); the information is still precious. The ratio of *actual people vs devices detected* can be used to generate an adjustment factor that can be used to estimate the exact number of people.

WIFI and Bluetooth scanning can be used alongside existing measurement systems, to add a rich set of meta-data. The concept of **state** is a valuable asset in any counting application – but particular consideration needs to be given to privacy and data protection law.

The most common applications of crowd counting are in retail, leisure, urban or recreational environments. The systems work best when it is used alongside a WIFI network or public hotspot.

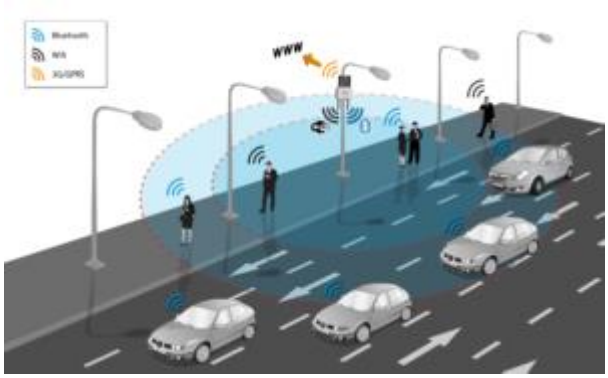


Vehicle Counting

Vehicle counting works in a similar principle to people counting but can detect both vehicles and the occupants of cars by listening for frames broadcast by the occupant's phones, or the vehicle itself. Meshlium scanners are positioned along roads and key transport routes, counting the number of unique or repeat devices visible to the scanner. Using a similar adjustment factor as before, the scanner can provide a good indication of trends relating to traffic levels.

Vehicle counting using WIFI and Bluetooth works best when used alongside more traditional traffic counting measures such as pneumatic tubes, inductive loops or other methods.

Commute Times and Traffic Flow



Many local authorities and organisations are interested in measuring commute times to indicate congestion and transportation effectiveness. When the Meshlium Scanners are positioned along a key transport route, the devices can be used to provide an indication of commute times. The first device can measure the first occurrence of a passenger or vehicle, while the second device – further along, the route, records the second occurrence. The time difference between the two indicates the commute time and traffic flow.

SI/T Surya Prakash B

Acknowledgement

We are highly thankful for reading out this compilation and hope it will be useful for you in day to day professional and personal life .We would like to hear your interest areas, suggestions from you to make this newsletter more informative and interesting. Your views will definitely help us to create this newsletter as an effective medium to reach you with latest development in the fields of communication and technology.

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