Maratha Vidya Prasarak Samaj's
Karmaveer Adv. Baburao Ganapatrao Thakare College Of Engineering
Nashik-13.
(NAAC ACCREDITED INSTITUTE WITH 'A' GRADE)

DEPARTMENT OF ELECTRONICS &TELECOMMUNICATION ENGG.

DepartmentalTeChronicle

Month: -February 2020

Vol. - 01, Issue – 04

Department Vision:-

To recognize as excellent department offering competent technical education to create competent electronics & telecommunication engineers for benefits of common masses.

Department Mission:-

Committed to serve the needs of society through innovative teaching learning process, promoting industry- institute interaction to provide competent and cultured electronics and telecommunication engineers.

Greeting,

Department of Electronics and Telecommunication is celebrating national science day by unveiling technical newsletter "TeChronicle" VOL-1, ISSUE-4 on 28th February 2020.

The day is observed every year to commemorate the discovery of the 'Raman Effect' by Sir C.V. Raman on 28 February 1928. He was awarded the Nobel Prize in Physics in 1930 for the same.

"Do what you love and love what you do". : - Mr. Narendra Goliya (Owner, Rishabh Instruments Pvt. Ltd., Nashik)

Team Editorial [AY 2019-20]

Mr. Narendra Goliya is an Electrical Engineer from IIT, Mumbai hold a M.S. in Micro Electronics from Stanford University, USA. He joined family business of manufacturing and marketing of Electrical Measuring Instruments in 1975. In 1983 he established Rishabh Instruments Pvt Ltd at Nashik, India. Over the years, he has built the Rishabh brand in Electrical Industrial Control, Test & Measuring Instruments. Sir is also the Technical Director of Nashik Engineering Cluster, a 60 crore project promoted in joint partnership with the Government of India for the development of industries in Nashik.

Mr. Narendra Goliya: Man of Deed, owner of a capital group consisting of Lumel and Lumel Alucast in Poland, Rishabh Instruments Pvt. Ltd. in India, and Sifam Tinsley in England and the USA.

Ultra-modern technology, innovative concepts and aggressive marketing are not the only factors for developing any industry, common sense and business foresight are equally important. Rishabh Instruments Pvt. Ltd., Nashik have captured excellent market share in Germany right from inception.

Rishabh Instruments Pvt. Ltd. has been a leading player in Test & Measurement from 1997. The company has witnessed many evolution in the products for power sector since its inception right starting from multimeters with automatic terminal blocking system, Clamp meters with patented rotating jaw design to Digital insulation testers compatible to work in 400kV live switch-yards, in latest multimeters with Bluetooth enabled feature having Android app for mobiles promoting wireless communication and safe operation.

Team TeChronicle with Mr. Narendra Golia Sir

Our team had a great opportunity to have interaction with Mr. Narendra Goliya were presented in words as bellow

Student: Since you have completed your B. Tech at IIT Mumbai and your PG at Stanford University, why did you choose Nashik as your place for profession?

Goliya Sir: Coming back to India from US, my main motto was to stay close to my family. Since, Mumbai in those times was not affordable in all terms, whereas Nashik MIDC had all favorable facilities needed to set up a business. So, I preferred Nashik as the basic sources required were easily available here.

Student: Who was your mentor?

Goliya Sir: Mentor changes in all walks of our life. In college usually professors are our mentors. According to me, the mentor may be older or younger than the person being mentored, but he or she must have a certain area of expertise. In my professional life my father was my mentor as he taught me the principles of business. So I could suggest spend more time with your mentors and respect them.

Student: With the changing scenario of markets being more challenging. What would be your advice to the students who dream of becoming an entrepreneur in future?

Goliya Sir: First of all, I would suggest be observant and choose the right product. Everyone has got equal opportunities they just need to discover it. Basically I would say, "Do what you love and love what you do". Upcoming entrepreneurs should focus on satisfying the needs of the society and do something for the betterment of the society.

Student: While recruiting students what do you expect from them?
Goliya Sir: The candidate must be innovative while thinking or doing any kind of work, they should think differently. He/she should be ready to take up any challenge and face it. One should have good communication skills and interaction skills which boost up the confidence of the candidate.

Student: Nowadays we hear that skilled engineers are required in Industries... What according to you are the skills required?
Goliya Sir: Basically all skills are required, what's happening in AI, Robotics, Composite materials, Industry 4.0.The most important skill is the ability to learn & also you should have the ability to learn the new things.

HEALTH HAZARDS OF ELECTRO-MAGNETIC RADIATION

Mr. A. R. Chaudhari [Assistant Professor]

Electromagnetic Interference is the slow spreading problem that is affecting almost all of us in many possible ways. The major causes of EMI are.

Natural sources of electromagnetic fields

Electromagnetic fields are present everywhere in our environment but are invisible to the human eye. Electric fields are produced by the local build-up of electric charges in the atmosphere associated with thunderstorms. The earth's magnetic field causes a compass needle to orient in a North-South direction and is used by birds and fish for navigation.

Human-made sources of electromagnetic fields

High power lines, electric motors, broadcast signals, electronic and communication gadgets besides natural sources the electromagnetic spectrum also includes fields generated by human-made sources: X-rays are employed to diagnose a broken limb after a sport accident. The electricity that comes out of every power socket has associated low frequency electromagnetic fields. And various kinds of higher frequency radio waves are used to transmit information – whether via TV antennas, radio stations or mobile phone base stations

The Wi-Fi devices and communication equipment, radio and cell phone signals present in a house affect the residents and also the people around them. Along with these, some household appliances such as Computer Monitors, Hairdryers, Electric stoves, Shaver's, clocks, and fluorescent lights radiate Low-Frequency Electromagnetic Interference which harms our body slowly.

According to the World Health Organization's International Agency for Research on Cancer (IARC), EMFs are "possibly carcinogenic to humans."

What happens when you are exposed to electromagnetic fields?

Exposure to electromagnetic fields is not a new phenomenon. However, during the 20th century, environmental exposure to man-made electromagnetic fields has been steadily increasing as growing electricity demand, ever-advancing technologies and changes in social behavior have created more and more artificial sources. Everyone is exposed to a complex mix of weak electric and magnetic fields, both at home and at work, from the generation and transmission of electricity, domestic appliances and industrial equipment, to telecommunications and broadcasting.

Tiny electrical currents exist in the human body due to the chemical reactions that occur as part of the normal bodily functions, even in the absence of external electric fields. For example, nerves relay signals by transmitting electric impulses. Most biochemical reactions from digestion to brain activities go along with the rearrangement of charged particles. Even the heart is electrically active - an activity that your doctor can trace with the help of an electrocardiogram.

Effects on general health

Some members of the public have attributed a diffuse collection of symptoms to low levels of exposure to electromagnetic fields at home. Reported symptoms include headaches, anxiety, suicide and depression, nausea, fatigue and loss of libido. To date, scientific evidence does not support a link between these symptoms and exposure to electromagnetic fields. At least some of these health problems may be caused by noise or other factors in the environment, or by anxiety related to the presence of new technologies. High-level EMF exposure is known to cause neurological and physiological problems by disrupting human nerve function

Electromagnetic fields and cancer

Despite many studies, the evidence for any effect remains highly controversial. However, it is clear that if electromagnetic fields do have an effect on cancer, then any increase in risk will be extremely small. The results to date contain many inconsistencies, but no large increases in risk have been found for any cancer in children or adults.

Electromagnetic hypersensitivity and depression

Some individuals report "hypersensitivity" to electric or magnetic fields. They ask whether aches and pains, headaches, depression, lethargy, sleeping disorders, and even convulsions and epileptic seizures could be associated with electromagnetic field exposure.

The high-frequency electromagnetic energies might interfere and resonate with DNA in our body. The energies of more than 100KHz might produce electric currents within the body. Major interference is from high voltage power lines and the cellular towers. Though we try to control the electrical radiation, the magnetic fields are so strong that can protrude well.

Some experimental studies concluded that exposure to electromagnetic radiation alters the neuromuscular function and motor activity in rodents. Similarly, when some monkeys were exposed to 60 Hz of magnetic fields for three weeks, the neurohormones in the spinal fluid of the monkey were such that the levels of serotonin and dopamine were depressed due to the exposure.

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VISUAL POSITIONING SYSTEM

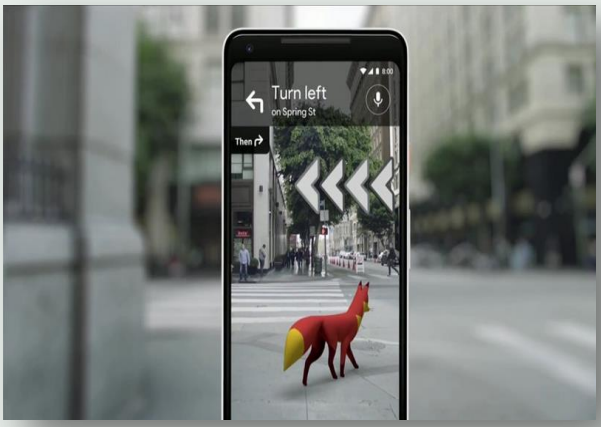
Piyush Patil [T.E E&TC]

Introduction

Have you heard about Google's new innovative Visual Positioning System that gave a novel look to the present maps navigation technology? This mind blowing update in the navigation world is creating a wave in life style of people all around the world.

With this new technology, Google Maps can make use of the user's phone camera to spot your surroundings and visually converse your direction right in front of your eyes.

VPS determines the location of a device based on imagery rather than GPS signals. VPS first creates a map by taking a series of images which have a known location and analyzing



them for key visual features, such as the outline of buildings or bridges, to create a large scale and fast searchable index of those visual features.

To localize the device, VPS compares the features in imagery from the phone to those in the VPS index. However, the accuracy of localization through VPS is greatly affected by the quality of the both the imagery and the location associated with it.

VPS!! How it works?

Leveraging the possibilities of GPS system and camera in the mobile phones and embedding the same with augmented reality Google is giving a new definition for navigation system. Let's have a look on how it works.VPS uses Google's extensive back-end data and your device's camera to analyze the surroundings where you are in. The greater accuracy of the features makes it really easy for them to identify where you are.

First of all, the button should be tapped to activate the visual view. Following, simply point your device's camera to the preferred destination to see the relevant info.The surroundings will be displayed with an overlay of Maps data for close by business and there will be arrows pointed in the direction where you have to go. You can also see a small map displayed on the bottom side which acts as a reminder for where you are headed.VPS retrieves its data from the surrounding buildings and landmarks where you are in rather than completely relying on satellite location that erases the possible flaws with GPS.

Google even has plans to put a character on the particular screen to give users a feel of an augmented reality tour guide. In the demo, they tried the navigation experience with a small fox.

More on VPS:

Amidst strong competition from independent firms such as Ubiquity6, Google announced a new Cloud Anchors feature in ARCore 1.2. This represents a preliminary form of fully realized VPS, using locally captured images as opposed to a centralized database. But the race to establish VPS infrastructure on a global scale and offload complex image processing tasks to the cloud is still on.

Competitor Fantasmo is angling to create a VPS database that democratizes the map creation process. By allowing free access to imaging data for public spaces and handing private property owners total control of interior maps, the company hopes to provide a more appealing alternative to Google's centralized approach.

However, the next generation of positioning technology relies less on satellite location. A new solution takes the form of a cloud-based repository of robust image data from physical environments. Dubbed a "visual positioning system" by Google, a pioneer in the space, this software is capable of determining indoor and outdoor location through ad-hoc visual markers. Distinguishing features such as signage, buildings, and walls are identified by scanning geolocated photos, enabling unprecedented accuracy in location data.

Expected Drawbacks:

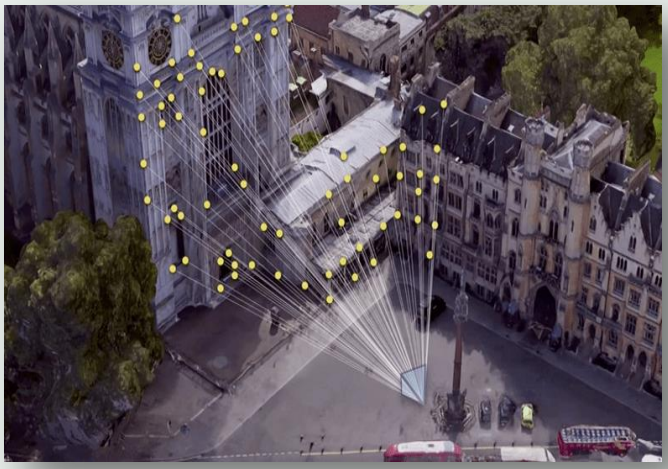
Just like every other innovations in technology, you cannot expect a perfect outcome as soon as it rolls out in the market.

Not to be a surprise, all indoor environment areas may not be appropriate for Visual Positioning System and there will be a lot of related issues to handle with at least in the first phase.

Sufficient visual interest will be the key in most cases in order to work reliably, especially for re-localization. False-positive detections can be avoided only with uniqueness of particular regions of the surroundings which can be challenging.

Unlike the preloaded street view, the changing lighting conditions can result in occlusion in a visual view. This can happen when some areas get white out, or appear to be in dark shadows.

In real world, there can be people or vehicles walking into your frame and blocking the accuracy of capturing location which is not in anybody's hands. If it is a busy street, things can go worse. However, you can expect Google to take some extra measures to overcome it at least to some extent.



Conclusion

The exact time of availability of the technology in your hand phones is still to be announced. We are hoping that they will come with an update soon on that.

Moreover, by the time it gets rolled out into the world of technology, we can expect a few more additions or improvisations in the technology features making it more mind blowing.

We have moved to an era from where we used to ask the people on the way to check if the navigation is correct to checking on the phone using GPS to confirm the route.

The innovations are opening a new world of navigation where your device visually communicates the route. This is giving clear hints that we can expect much more on the years to come.

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SINGLE ELECTRON TRANSISTOR

Pratik Pawar [T.E E&TC]

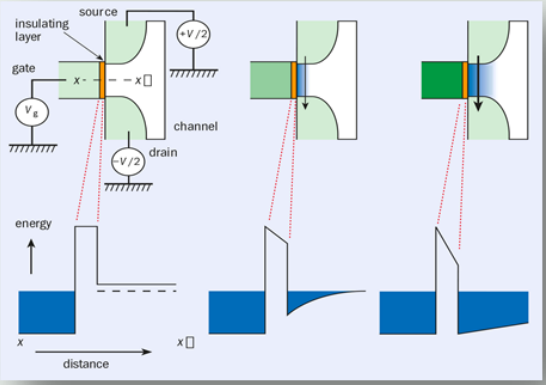
The most common transistor in today's microchips is the metal-oxide-semiconductor field-effect transistor **(MOSFET)**. Its operation is surprisingly simple: not much quantum mechanics is required to understand how it works, even though the size of a typical device is now just a few thousand atoms placed side by side.

What does Single-Electron Transistor (SET) mean?

A single-electron transistor (SET) is a switching device that consists of two tunnel junctions sharing a common electrode and makes use of this controlled electron tunneling for amplification of current. The technology used in single-electron transistors is based on the theory of quantum tunneling. Considered an important component of nanotechnology, single-electron transistors provide high operating speed and low power consumption.

Applications

- They can be used as ultrasensitive microwave detectors.
- They can be used to detect infrared signals at room temperature.
- They are also efficient charge sensors capable of reading spin or charge qubits.
- Their high sensitivity feature allows them to be used as electrometers in experiments requiring high levels of specificity.



Difficulties:

- Single-electron transistors are not suitable, however, for complex circuits owing to the fluctuations present in them.
- Other limitations include randomness of the background charge and difficulty in maintaining the room temperature.

Reference:

https://www.research.ibm.com

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