In Depth - Visual Positioning System

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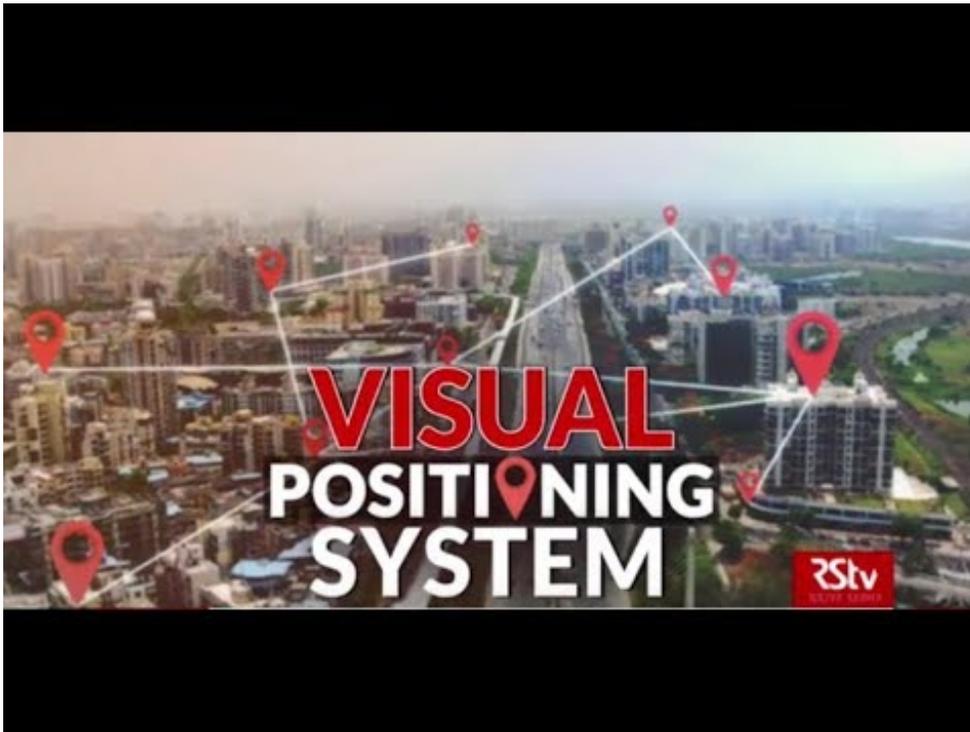
Google has announced a revamped version of Maps that utilizes a complex **visual positioning system (VPS)** to offer improved navigation. VPS has been designed to overcome challenges of global positioning system (GPS) and is far more accurate.

What is Virtual Positioning System (VPS)?

VPS is the logical progression from a globally connected network, exhaustive data and new cloud storage accessibility. VPS is the blend of artificial intelligence (AI) image recognition technology and augmented reality technology, which combine symbols on the apps screen with real-life street images.

- It combines the live camera with Google's extensive back-end data in order to analyse the surrounding, which helps to identify the location of a user with greater accuracy.
- It uses augmented reality to give additional information.
- The technology was recently used in the Chandrayaan II mission.

Positioning System

A positioning system is a tool to determine the location of an individual or object. The technology requires global coverage and sharp accuracy to achieve the exact location.

> **For Example:** 'Google Maps' is one of the positioning and navigation systems that helps individuals to find their exact location as well as a path to their destination. However, the system only offers a satellite view of the region under navigation.

Global Positioning System

GPS is a **satellite navigation system,** used to determine the ground position of an object. It is a **U.S.-owned utility** that provides users with positioning, navigation, and timing (PNT) services.

> It is a network **24 satellite** which provides service to civilian and military users. The civilian service is freely available to all users on a continuous, worldwide basis. The military service is available to U.S. and allied armed forces as well as approved Government agencies.

How does it work?

- Visual Positioning System allows the device to virtually localize surroundings in a map. It uses multiple images of the surrounding environment for creating a 3D environment.
- The system compares the multiple-image of the environment taken by the phone's camera to recreate the position relative to the environment using triangulation techniques of GPS.
- For using the technology, the user needs to tap a button to activate the visual view and just point the camera where he/she needs to go to see relevant information.
  - Surrounding will be displayed with an overlay of Google map data.
  - There will be arrows pointing in the direction the user needs to go, with a small map at the bottom to remind you where you are headed.
  - The technology is capable of determining indoor and outdoor locations through ad-hoc visual markers. Distinguishing features such as signage, buildings, and walls are identified by scanning geolocated photos.

Virtual Reality

Virtual Reality (VR) is the use of computer technology to create a simulated environment.

- Unlike traditional user interfaces, VR places the user inside an experience i.e instead of viewing a screen in front of them, users are immersed and able to interact with 3D worlds.
- VR enables simulation of as many senses as possible, such as vision, hearing, touch, even smell.
- In this, the user is completely immersed in an artificial world and cut-off from reality.

Augmented Reality

Augmented Reality is the use of sensors and algorithms by computer to determine the position and orientation of a camera.

- Augmented reality is closer to the real world, it adds graphics, sounds and smell to the natural world as it exists.
- The user can interact with the real world along with the virtual world.

Difference between VPS and GPS

Global Positioning System	**Virtual Positioning System**
- GPS is based on time and the known position of GPS specialized satellites i.e distance-based technology. - GPS presents only a satellite view. - GPS faces the problem of drifting due to continuous change in the position of satellites, weak signals due to thick clouds and tall buildings. - GPS has a voice system to guide the user.	- VPS combines a live camera view with Google data along with GPS. - VPS displays blown up 3-D directions like lit-up arrows and precise steps to figure out the exact location. - VPS addresses the problem of drifting by running its own copy of the operating system. - VPS uses animated characters to display nearby locations like banks, hotels etc to help users to identify the location easily.

Benefits

- **Business and Marketing:** VPS allows businesses to fill the Google business profile through which customers can see relevant information about the business.
    It also allows businesses to take their customers to have a virtual visit to the store or product repository.

- **Logistics:** VPS holds potential to dramatically revolutionize the logistics and transportation sector by enhancing navigational capabilities of robots, drones and driverless cars.
- **Navigation:** The technology can be a gamechanger in navigational experience in dense urban areas where GPS services are often distracted or blocked by skyscrapers.
- It offers remarkable comfort and ease for travel from one spot to another by providing a live camera view with negligible dependency on others to get directions.

Conclusion

Technologies like GPS and VPS are revolutionizing digital mapping that are of immense help in our daily life. Therefore, with such technological evolutions, the services offerings are expected to be more virtual, customized and augmented for each person.