

A Survey On Location Tracking

D.Jayanarayana Reddy¹, S.Simi Sanya²

¹Assistant Professor, Dept of Computer Science & Engineering

²Dept of Computer Science & Engineering

^{1,2}G.Pullaiah College of Engineering and Technology, Kurnool, India

Abstract- Location is generally obtained by the coordinates of latitude and longitude on a particular position on the globe. Location tracking is the process through which a person's location coordinates can be determined. Now-a-days Tracking location for a person can be achieved easily through the smart phones. Location tracking can be used to keep the people safer as the crime rate is increasing at a faster rate. A person feels safer when the location can be tracked at any instance of time. It plays a very important role for police, firefighters, military personnel and large courier businesses.

Keywords- Location tracking, Coordinates.

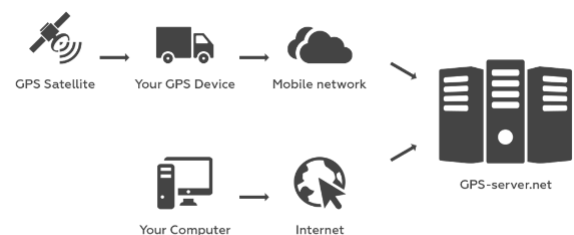
I. INTRODUCTION

Location tracking is the process of obtaining position through the Global Positioning system also called as GPS to track the location of an object remotely. The GPS is a collection of 24 satellites that orbit Earth and make it possible for people with ground receivers to pinpoint their geographic location. GPS equipment is widely used in science and has now become sufficiently low-cost so that almost anyone can own a GPS. The tracking of a location can be done by a GPS tracking unit. A GPS tracking unit is a device that uses the GPS to determine the location of the user at certain intervals of time and also store it to a central location database, or internet connected computer using a radio signal or a satellite modem contained in the unit.

A GPS generally contains a module that takes the GPS signal and calculates the coordinates. The tracking of location can be done by using trackers. There are three types of GPS trackers they are data loggers, data pushers, data pullers. The GPS loggers log the position of the device at regular intervals of time in its memory. They may or may not have a memory card slot or internal flash memory or an USB port. Most of the digital cameras save the image as the photo was taken but they also save the location along with the photo such an image is called as "Geotagged Photograph". Cameras with GPS receiver built in can directly produce a geotagged photograph. In some investigation cases, data loggers are used to keep target vehicle.

The most common type of GPS tracker is the data pusher and is used for asset tracking, personal tracking and vehicle tracking system. The personal tracking devices are used in the care of elderly and vulnerable. These devices allow users to call for assistance and optionally allow the carers to locate the user's position, typically within 5 to 10 meters. Aircraft can be tracked either by ADS-B or by FLARM data packets picked up by a network of ground stations both of which are data pushers.

GPS data pullers are also known as GPS transponders. Unlike data pushers that send the position of the devices at regular intervals these devices are always on as required. This technology is called as pull technology. It is not in widespread use but is an example of this kind of device is a computer connected to the internet. They are often used in a case where the location of the tracker will only need to be occasionally recorded for example placed in a property that maybe stolen, or that does not have constant source of energy to send data regularly. Data pullers are coming into common usage in the form of devices containing a GPS receiver and a cell phone which, when sent a special SMS message reply to the message with the location coordinates.



II. PRINCIPLES OF OPERATION IN GPS

The GPS system consists of three segments. They are space segment, the control system, the user segment. The space segment is the number of satellites present in the constellation. The function of the space segment is utilized to route/navigate signals and to store and retransmit the message sent by the control segment. These transmissions are controlled by highly stable atomic clocks on the satellites. The satellite constellation forms the GPS space segment to ensure

that the users will have, at least, 4 simultaneous satellites in view from any point at the Earth surface at any time.

The control segment comprises of a master control station and five monitor stations outfitted with atomic clocks that are spread around the globe. The five monitor stations monitor the GPS satellite signals and then send that qualified information to the master control station where abnormalities are revised and sent back to the GPS satellites through ground antennas. Control segment also referred as monitor station. The user segment comprises of the GPS receiver which receives the signals and determines the distance from the satellite. It is generally used by the military, civilian applications for GPS in almost every field.

III. WORKING OF GPS

Broken down to the simplest terms, the satellites orbiting around the Earth broadcast their location and the current time. The receivers listen to several satellites and from the broadcasts determine where the receivers are located at a particular instance of time. Each satellite broadcasts two signals consisting of carrier waves and the navigation message. It includes the current time to the nearest second and the information needed to compute the location of the satellite at the time of transmission. Using this information the receiver can set its clock to the correct second and compute the current position of the satellite. Using simple geometry the receiver now knows it is somewhere on the surface of the sphere centered on that satellite with the radius equal to the distance from the satellite. Each satellite circles the globe at about 12,000 miles (19,300 km), every day (making two complete rotations of the earth's diameter). The paths of the satellites are programmed in such a way that there are at least four satellites visible in the sky at any given time and place on earth.

What a GPS receiver does is locate the four or more satellites and find out the distance between each one of them. Using this information the GPS tracking system in our car or other devices finds out its current location. The information is presented as maps, latitude and longitude specification etc. Although first developed basically as a U.S. military navigation system it was later open to the end user. Today with a GPS car tracking system we are at a point where it's impossible to get lost.

IV. ADVANTAGES

GPS was originally designed for the U.S military department of defence to improve the military navigation, GPS devices now are available for consumer use. It has

various advantages they are device options, neighbourhood search, Weather and traffic alerts and accuracy. GPS units come in a variety of different formats. For example, certain vehicles come equipped that uses a satellite to provide directions. The portable GPS devices can be mounted on the windshield or dash they offer the same functionality. Many GPS devices provide the ability to search a desired location for specific landmarks. This functionality may help us to determine the best places to stop during road trips or even day-to-day travels. It is important to remember that not all GPS devices will account for recent neighbourhood landmark changes. Depending on the device we use the GPS may provide weather and traffic alerts. These alerts tell us about the adverse weather and traffic conditions. Typically, these alerts include an alternate route. Over time, road names may change or new roads may appear because of this your GPS may provide incorrect directions. Updating the GPS software may reduce the chance of taking a wrong turn.

V. CONCLUSION

A closer look at the underlying theories and techniques readily reveals that GPS positioning is not simple. For scientists GPS is a utility with an endless list of applications and ranging from ionospheric studies to earth crust deformations. The list is equally long for engineering applications. GPS has become a national utility. In its current form GPS is a very useful complementary tool to augment the understanding of physical activity behaviour rather than a stand-alone measure.

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