



GPS AND ITS FORENSIC IMPORTANCE IN POLICE CRIMINAL INVESTIGATION AS AN INNOVATIVE TECHNIQUE: AN ANALYTICAL STUDY

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Abstract

The present research paper deals with the forensic importance of GPS as an advanced tool developed over the period of time. The GPS is actually called as ‘satellite-based radio navigation system’ tracking technology, which not only helps in as a navigating tool and pin pointing the exact location of a particular address or a person through Global Positioning. In today’s digital era, GPS as a tool strengthening the role of police by using this technology smartly in criminal investigation, where almost everyone using today smart phone including Criminals. There were enough cases, where smart policing successfully cracked down the mysterious crimes in India by using the GPS. It is also very useful for traffic police in monitoring the speed of the vehicles and traffics in different areas of the city as well as in the outskirts areas. It would also be an additional help to police in hit and run accidental and other criminal escaping cases. The trained Police personnel in GPS tracking would perform more efficiently than the ordinary Police.

Most importantly, the evidences gathered through GPS has forensic importance in the court of law, which can never be denied. Any technology which helps in legal process of Justice System has its forensic importance, so equally true in case of GPS, which can be called as Forensic GPS. Today, apart from the monitoring vehicles, police are widely utilizing the GPS like in Beat and Patrolling, monitoring probation and parole offenders, bank and ATM cash transaction by Automatic Vehicle Location Navigation (AVLN) etc. In almost all the states in India today are using GPS as a major application tool for prevention and detection of crime. Few important famous cases cracked in India from 2010 to 2022 have been discussed in this research paper.

Key Words: GPS Tools, Technology Usage, Criminal Investigation and Famous Cases.

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INTRODUCTION

The Global Positioning System (GPS) is a United State-owned utility that provides users with positioning, navigation, and timing (PNT) services. This system consists of three segments: *the space segment, the control segment, and the user segment*. The U.S. Space Force develops, maintains, and operates the space and control segments.

The Space Segment:

GPS space segment consists of a constellation of satellites transmitting radio signals to users. The United States is committed to maintaining the availability of at least 24 operational GPS satellites, 95% of the time. To ensure this commitment, the U.S. Space Force has been flying 31 operational GPS satellites for well over a decade.

Castellation arrangement:GPS satellites fly in medium Earth orbit (MEO) at an altitude of approximately 20,200 km (12,550 miles). Each satellite circles the Earth twice a day. The satellites in the GPS constellation are arranged into six equally-spaced orbital planes surrounding the Earth. Each plane contains four "slots" occupied by baseline satellites. This 24-slot arrangement ensures users can view at least four satellites from virtually any point on the planet. The Space Force normally flies more than 24 GPS satellites to maintain coverage whenever the baseline satellites are serviced or decommissioned. The extra satellites may increase GPS performance but are not considered part of the core constellation.

The control segment:

GPS control segment consists of a global network of ground facilities that track the GPS satellites, monitor their transmissions, perform analyses, and send commands and data to the constellation. The current Operational Control Segment (OCS) includes a master control station, an alternate master control station, 11 command and control antennas, and 16 monitoring sites. The locations of these facilities are shown in the map.



User Segment:

Like the Internet, GPS is an essential element of the global information infrastructure. The free, open, and dependable nature of GPS has led to the development of hundreds of applications affecting every aspect of modern life. GPS technology is now in everything from cell phones and wristwatches to bulldozers, shipping containers, and ATM's. GPS boosts productivity across a wide swath of the economy, to include farming, construction, mining, surveying, package delivery, and logistical supply chain management. Major communications networks, banking systems, financial markets, and power grids depend heavily on GPS for precise time synchronization. Some wireless services cannot operate without it. GPS saves lives by preventing transportation accidents, aiding search and rescue efforts, and speeding the delivery of emergency services and disaster relief. GPS is vital to the Next Generation Air Transportation System (NextGen) that will enhance flight safety while increasing airspace capacity. GPS also advances scientific aims such as weather forecasting, earthquake monitoring, and environmental protection. Finally, GPS remains critical to U.S. national security, and its applications are integrated into virtually every facet of U.S. military operations. Nearly all new military assets -- from vehicles to munitions -- come equipped with GPS.

As the GPS technology is utilized by every government, corporate organizations as well as common people, this technology is also assisting the criminal justice system across the globe, especially the law enforcement agencies in prevention of detection of crime. It also assists law enforcement in mapping the area for identification of crimes, identifying the hotspots of crime and assisting the judiciary in deciding the cases as supportive evidence.

The current study is carried out to explain how the GPS tracking will assist the law enforcement and criminal justice system in solving the cases, the study is theoretical in nature, as the study is based on case studies of crime solved in the past 10years.



CASE STUDIES

Asset Tracking and Collaboration with a Resident Leads to Arrest of Package Thieves

At the end of 2018, a resident of the unincorporated community of Keno in Klamath County, Oregon, indulging their somewhat morbid inquisitiveness, decided to set trick out the package thieves in their mailbox, just to “see what would happen.” The county had had a recent string of mail and package thefts, so the resident stuck a GPS tracker inside a fake parcel and left it out as bait. As it turned out, the idea proved fruitful, and soon afterward the resident was alerted to the device moving out of its location in their front yard.

They called emergency services, who then got in touch with local law enforcement and set up a relay. The asset tracking software meant that dispatch was continually updated on the package’s position and direction of movement, allowing them to pull over a suspicious vehicle as it headed for Klamath Falls. Sure enough, deputies found the couple inside with the bundle, along with other mail from nearby counties. As it turned out, the same pair had been charged and suspected in several other similar crimes over the previous months, from identity theft and credit card fraud to forgery and drug possession. One citizen’s spur-of-the-moment decision to employ an asset tracking solution helped police officers find and put a stop to an ongoing crime spree that had been plaguing the community for weeks.

Police Found Lawful in Using GPS to Track Down Burglar

In Frederick County, Maryland, a court ruled that an accused burglar did not have the legal right to challenge the Washington County police force’s use of a GPS locator that they had placed in his car. Case details are like this, police had put the GPS device into the man’s 2005 Nissan Armada which they suspect he had stolen — on a night in early March. The following day, they arrested him after the vehicle was tracked to another resident’s home, one they believed that he had broken into.



The suspect argued that he had been given use of the Armada by another, now deceased man who did not own it, but had failed to tell him. Because he did not know that the car had been stolen, then, it was not legal for the police to use their GPS tracking systems to locate the vehicle without first obtaining a search warrant. However, based on testimony from the actual owner and another detective, along with photographic evidence that put the Armada as being stolen sometime prior, including being spotted at two different burglaries in subsequent months, the judge ruled that the man did not have a “reasonable expectation of privacy,” whether he knew it had been stolen or not. Furthermore, the police had been given consent by the vehicle owner to place the GPS tracker and had followed it to another house where the suspect was seen coming out carrying a handgun. The man was subsequently sentenced to trial, and a series of robberies was stopped.

Using GPS to Stop Porch Pirates

With the steady rise in popularity of online shopping and the inevitable burst of spending that comes during the holidays, the theft of dropped-off package deliveries has become a particularly significant inventory management problem in recent years. To combat this, Jersey City, New Jersey implemented a partnership between the local police force and Amazon to catch the thieves, planting GPS tracking devices inside decoy boxes gussied up to look like official shipments. These decoys are set to automatically trigger an alert to local police once they are moved from their resting position, allowing law enforcement to either catch the thief in the act or track the pilfered goods to wherever they intended to resell them.

As city mayor Steven Fulop revealed, the real-time asset tracking program proved its worth almost immediately, highlighting just how much of an issue this brand of crime has become. Within the first three days alone, officers made a dozen arrests, the first of which occurred within minutes of the initial decoys being set up. Fulop admits that this solution is only a temporary one that’s only viable during the holiday boom. That’s because local police can’t commit an entire team to track these burglaries year-round, especially when they get upwards of 400 similar complaints annually. And those 400 likely represent a fraction of the people who are being targeted since many don’t bother



with calling law enforcement and get in touch with the seller directly instead. It's a step forward in the right direction, however, and could help deter potential takers in the future.

GPS solved the January 1 murder mystery in Ratlam

INDORE: Global Positioning System (GPS) installed in the truck proved vital for Ratlam police in cracking murder mystery of an UP-based truck driver that was perpetrated on January 1. Eight days after the blind murder, Ratlam police have arrested five accused who first tried snatching truck keys from the driver and upon unsuccessful attempt slit his throat behind a Dhaba where the driver, Mahipal of Etah district (UP), had stopped for dinner. Later, the accused dumped the body at a nearby nullah.

The arrested accused were identified as Aizaz Khan (26), Shahrukh Mewati (21), Imran Nahru (20), Saddam Shareef (22) of Umatpalia and Bilal Mewati (18) of Madarpura, Mandasaur. Ratlam, Superintendent of Police (SP), Dr Ashish said, "We were able to trace the location of truck with the help of GPS installed in it. A team constituted to investigate the matter found that the truck driver had stopped at New Khalsa Dhaba in Umatpalia for dinner. He stopped for nearly two hours. In police custody, he spilled the beans and named his accomplices in the murder."

GPS data from Garmin smartwatch helps police catch a man convicted of two murders

According to a report by the Liverpool Echo, data from a Garmin Forerunner watch was recently used as a critical piece of evidence against underworld hitman and runner Mark "Iceman" Fellows who has been accused of killing an organised crime leader Paul Massey and his associate John Kinsella in 2015. Manchester police, while investigating the twin murder case, noticed Fellows sporting a GPS smartwatch while running the Great Manchester run 2014 following which they decided to search his home to find the watch.

The data from the Garmin smartwatch showed that Fellows had been conducting reconnaissance runs or survey runs near Massey's house less than two months before killing him. The activity track from the Garmin smartwatch showed a 35-minute activity that began near Fellows' own home and ended near a field right outside Massey's home. Upon examining the data from Garmin



smartwatch further, the police discovered that on the day of Massey's murder, Fellows initially travelled at a speed of about 12mph, suggesting that he had a bike, following which his speed dropped to 3mph, which indicates that he could be walking at the time. The hitman then stopped for about eight minutes. The Manchester police used this data as an evidence to show the escape route Fellows had taken after gunning down Massey in his own driveway. Fellows has been sentenced to serve life in prison.

Smart watch data helps Australian police close murder case

Australian police determined time of death in a murder case and other relevant information by carefully analyzing data collected by the victim's Apple smartwatch. 57-year-old Myrna Nilsson from Adelaide, Australia, was found dead in her home in September 2016 and the police already had a prime suspect – her daughter-in law, Caroline Nilsson. At the time of her death, Myrna Nilsson was wearing the smartwatch that collected data in real-time. The data contradicted her daughter-in-law's testimony who claimed Myrna had been followed home by men and argued with them. Caroline claimed she didn't hear the attack in the house and was later tied up by the attackers.

The smartwatch, however, contradicts her statement, supporting prosecutors' allegations that she was murdered her mother-in-law and then covered up the murder scene. The watch recorded activity and heart rate data compatible with a struggle and then with her body going into shock and losing consciousness. There was also no DNA evidence of attackers in the house. "The evidence from the Apple iWatch is a foundational piece of evidence for demonstrating the falsity of the defendant's account to police," prosecutor Carmen Matteo said.

"A watch of this type contains sensors capable of tracking the movement and rate of movement of the person wearing it and it keeps a history of the wearer's daily activity, it also measures the heart rate."



CONCLUSION

By analysing the above cases, it is clear that GPS can be a vital technology in not only in prevention and detection of crime but also in conviction of the criminals. Hence it is necessary that all the criminal justice organization across the globe must adopt GPS technology as we have witnessed it can be vital in solving the heinous offenses. Also, the government must make mandatory use of GPS in every aspect of life in general and for crime prevention in particular by adopting suitable legislation. It is also necessary that law enforcement agencies must be provided the training, on how to use the GPS in criminal investigation, detection and prevention of crimes.

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