

# Where's Waldo?

The Location Feature on Cellular Devices



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When thinking of cellphones, many think of them as just simple communication devices. In the early 2000's, a decade of innovation, cellphones went from voice calling devices to a full blown connection to the world. Voice calling, texting, picture messaging, video chatting, and social media applications are only a few functions of even the simplest cellphones today. These certain functions of a cellphone, along with many others, have one thing in common, the location feature. The location feature installed in cellphones allows it to function like a GPS navigator. GPS stands for Global Positioning System, which uses satellites transmitting radio signals to a device. Originally GPS was developed for military uses for technology advances in war times, and was never truly considered to be used for civilians. In the early 2000's cellphones were created with the location to locate emergency callers. Today, the location feature is used for more than a users location that offers many advantages but there are also underlying disadvantages to this function that many do not seem to realize.

The location feature in a cellphone is also known as Location-Based Services. "Location-based services (LBSs) are a category of location-aware applications used through smartphones that access a user's location in order to accomplish a task. The four main focus of LBSs are mapping, locational information management, social networking, and geotagging over social media" (Wong 2014). LBS were molded into cellphones primarily to locate callers dealing with an emergency such as a robbery or fire. In a state of emergency, Location-Based Services could be a life saver, literally. Cellphones LBS are able to help the police or paramedics locate a person in need in a timely and efficient manner. LBS also comes in handy when children are given smartphones. Parents are able to track their childrens whereabouts without having to call them every hour or risk being lied to.

A major feature that most cellphone users are using is the actual GPS system installed in their phone. The GPS or MAPS application on cellular devices can locate any business, address, even popular attractions. GPS navigation and location tracking applications are the most popular on mobile devices because of their usefulness and popularity during a trip to an unfamiliar place. Tourists use to have to look at paper maps or tour guidebooks during the trip, resulting in wasting time and easy to get lost (Gupta, Priya, and S. S. Sutar). The LBS is very useful in this case because it can tell exactly how far away a destination is, how long it will take, and even gives a variety of directions. On smartphones such as Androids, iPhones, and Blackberries, there are now location-based applications that one can download and simply type in where they would like to go. "Location- based services (LBS) provide the mobile clients personalized services according to their current location. They also open a new area for developers, cellular service network operators, and service providers to develop and provide value-added services: advising clients of current traffic conditions, providing routing information, helping the users to find nearby shopping malls. Location-based services offer many merits to the mobile clients" (Vanjire, 2014).

It seems that everyday these smartphones are getting smaller and slimmer in size, and can easily be lost or stolen, and because of their popularity all smartphone devices have become a hot commodity for criminals. Another advantage to having the GPS feature on is being able to easily locate your lost phone. On the droid phones there is an application called "Where's My Droid", that helps locate a user's phone through the GPS feature. On the iPhone there is an application called GPS Phone Tracker, which allows any iPhone user to

track their own phone, as well as being able to lock their phone if it is stolen so it becomes useless.

There are many underlying disadvantages of the GPS feature, which some do not think of, that can be very dangerous to a person, and can even infringe on their privacy. People's concern over their privacy with their phones has only gotten worse through the years. Edward Snowden enlightening of what the government can do. "Although LBSs benefit users by allowing them to more easily navigate, find specific places, locate other LBS users, and share their location over social media, they also generate some apprehension in regards to personal security. In recent months, the United States' National Security Agency (NSA) was exposed for monitoring the phone records and Internet activity of millions of Americans and foreigners alike ('Secrets, lies and America's spies', 2013). The media panic over this issue is amplifying public anxieties and inciting global concern over the security of users mobile phones, paranoia about how much surveillance everyone is unknowingly subjected to, and questions about who may or may not be tracking their daily movements. The current atmosphere of suspicion is central for the exploration of LBSs that have the potential to be used to invade person privacy" (Wong, 2014).

With GPS being added to our phones, tracking a phone is now more precise. At one time, in order to track a phone, the phone had to be on and it had to communicate to a couple of towers; in which it had to communicate the strongest to the closest tower, which allowed the phone's position to be found within a few tens of meters (Rosenwald, 2004). Now with the GPS added, phones can now be found within a few meters of the actual position, which can be shared with anyone if someone wanted it. This is where the problem

of privacy lies, police officers do not need a warrant to look into a user's phone, and see where the user last was. In getting a warrant all a police officer would need is probable cause and that is very easily obtained from a judge, so there actually is no protection to our phones. Since 2005 "U.S. Federal Law has required all phones to make this information available" to law enforcement, and has even found that the U.S. Department of Justice had secretly asked for permission to track user's phones without probable cause (Reilly, 2007). Police officers see these phones as a pretty good tool to catch a criminal, but they should have to follow proper laws, but the legal system cannot keep up with the advancements in technology and laws that they need to pass.

The government feels that it is not infringing on citizen's rights by locating where they are at any time. The government has been pushed to make laws towards cell phone tracking, especially with the law enforcement end, not just criminals. The Geolocational Privacy and Surveillance Act (GPS Act) is a proposed bill that is asking the government to realize that cell phones with GPS are just as precise as GPS devices a person can buy. A person can use these cell phones enhanced with GPS more accurately now than with the global positioning satellite devices, and that is because they also use cell towers to triangulate a signal (Greenberg, 2012). In April 2012 the American Civil Liberties Union had published documents proving that police departments around the country would track cell phones without the use of warrants, and even using devices that can gather data from cell towers without calling a carrier to receive the data (Greenberg, 2012). There is a coalition group that includes Google, Apple, Microsoft, and others, who are pushing for reforms to the phone-tracking laws. Unfortunately with advancements with technology the

legal system is struggling to keep up, and with their struggle there are more criminals being able to find ways to cause havoc.

The GPS feature on phones has also helped steer stalking a person into the 21<sup>st</sup> century. “Four out of five stalkers are men, according to a 1999 study”, and there are five different types of stalkers that are defined through the study (Rosenwald, 2004). The usual stalkers are defined as “rejected” stalkers who are usually motivated by anger through a break up from an ex. The other three are motivated romantically, but have not actually been involved with their victims. The “intimacy seekers” think they are in love and want a relationship with the victim, the “incompetents” are awkwardly seeking a first date, and the final stalkers motivated by romance are the most dangerous, “predatory,” they are actually seeking to harm the victim. The final type of stalker is the “resentful” stalkers, they just want to cause misery to the person they are stalking; there is no love or need for romance in this stalker.

The first law to even go in effect against stalkers using GPS was with the Robert Sullivan case in 2000. This man is considered a rejected stalker, where he and his wife ended up getting a divorce. Here he stumbled upon a GPS site that claimed they could find everywhere his ex-wife went. Since there were no laws protecting his ex-wife this became a huge and scary battle, which lead to Sullivan getting violent, and that was the only way the police could act against him. Once in court the legal system started to realize this was an issue and said that she was “under surveillance”, and an anti-stalking law was passed which banned activities that included “photographing, videotaping, audiotaping, or through any other electronic means, monitoring or recording the activities of the victim” (Rosenberg,

2004). Although the unfortunate part of this is that it did not cover cell phones, there are more and more cases that are piling up with stalkers using cell phones to follow their victims, and with the technology on cell phones it is even more dangerous than with just the GPS device someone can buy.

Between people being able to access a persons phone without them knowing, and no laws protecting them as a user, there is a real issue with having the GPS feature on at all times. Yes, there are benefits to having GPS on cellular devices, but in the end does the good outweigh the bad? The Government also has to start realizing that these devices can contain information that deals with citizen's rights, especially in the hands of criminals. Hopefully the legal system will catch up to all these technology advancements, and also keep law enforcement within the laws also, and allow people to protect their privacy.

When installing any type of application on a cellphone whether it be Facebook or Candy Crush, the user is allowing that application service to have access to mostly all of their personal information, including their location. Allowing any of these applications to have access to a users location allows them to send out push notifications. Advertisers are able to locate where you are which allows them to send out push notifications to get the users attention and spamming their phone. These applications are giving consent for cellphone users to give out their location at all times and opening up a new door for businesses to force their advertisements on them.

With the increased usage of cell phones and other mobile devices through the years, the more usage of acquiring a person's location information has been incorporated into cellphone apps. Each app users download, with or without their knowledge, asks for the

usage of their location information. With this information being collected, the companies using it and the government can access our personal information. This information allows them to follow users lives every time they access these apps. They know where cellphone users and when they are there. According to the Trustwave SpiderLabs website, "it is important to understand how this information is collected on these devices, as each method has its own levels of precision. Location service information is typically obtained in three different ways—global positioning systems (GPS), cell tower triangulation and via Wi-Fi hotspots." The Global Positioning Systems, or GPS, is a system that is satellite-based that orbits the world and helps locate places. Many use the Global Position Systems mostly to retrieve directions to get them from Point A to Point B. Each time a person uses their systems on our phone, they are allowing access to where they are and where they are going and approximately how long it will take them to get there. With this information open, we are allowing criminals to access our data giving them the information they need to target us physically or access our homes. Cell tower triangulation is a way to pin point a mobile devices location but channeling the signals that bounce between cell towers. This system works similar to the global positioning system, which allows for the same problems of giving information to criminals and other unwanted sources. The other way location information can be collected is through Wi-Fi hotspots.

In a recently released article on Yahoo's website, confirmation has been made that Google is tracking cellphone users every move. Yahoos along with many other websites, such as Infowars.com, are releasing the same story about the tracking and how to help prevent users tracking. According to the article, the picture shows the points of where someone's ending locations, or stops they have made along with the red lines which are the



lines of travel they took to get to each point. With the link given in the article and logging into Gmail, users are able to see the data Google has collected from their phone. With the detailed records Google has, not only can they collect the data to create a group of most visited places or popular spots, but on the other end of that, the data can be accessed by criminals or illegally by other companies who are stealing cellphone users personal information. The positive side of this issue is the fact that there is a way to turn off the recording keeping. Google provided step-by-step instructions to turn off this feature.

Another group tracking their customers is Apple. Multiple stories have been released calling Apple iPhones, "Spyphones". According to [dailymail.co.uk](http://dailymail.co.uk), "Hidden in Apple phones is a function which logs every journey." They are able to track exactly when you leave somewhere, where you bought your coffee and places you like to visit such as shops or restaurants. "The function – called the Frequent Locations feature – was quietly introduced to iPhones a year ago," states the Daily News website. Due to the newness of this feature, along with the layers of setting options users would have to go through to turn this off, very few people know it exists.....until now. Now the bigger question is, is this a good feature to have or not? Some would argue this is a great feature to have as parents could track their children or the government could collect valuable data about the public but others consider this to be an invasion of privacy. Without cellphone users knowledge of this feature, their privacy is being invaded. According to Professor Noel Sharkey, "This is shocking,' he said. 'Every place you go, where you shop, where you have a drink – it is all recorded. This is a divorce lawyer's dream. But what horrifies me is that it is so secret. Why did we not know about this?'" The truth in that statement could be cut with a knife. This feature is a lawyer's dream with being able to track everyone involved in a legal case to determine some details

about what happened. This also helps in a divorce case to know where someone has been spending their time if they are not with their spouse or families. With tracking people's information, many can also track their URLs they visit and every phone number they dial. Is this an invasion of privacy? Most would say so. Not only are they collecting and using the location information, but also stealing other phone numbers and information would be classified as a crime.

There are a number of pros and cons to using the location feature on cellular devices. The reason people look beyond the dangers of using our GPS feature is because of the many advantages that they get out of having them their cellphones. Whether it be for receiving directions for a place users would like to visit, or for the emergency services it can provide, it seems people feel that these reasons outweigh the disadvantages of the feature. In the end hopefully cellphone users will have more of an understanding about the GPS feature on their devices, and are able to make a decisions based on their needs in their lives. It is crucial that all cellphone users are able to understand what exactly these features and applications are asking and how they work before agreeing to the terms and conditions. Knowing what it means to have the location setting turned "on" while a user is on their cellular device iscrucial. Users need to be absolutley sure they understand what all the features on their smartphone intail, and understand they can be at risk when using certain applications. Is it really worth or necessary leaving the location feature on users cellular devices at all times, or should all cell phone users be thinking more about turning it on when they need it for their ownspecific reasons?

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