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ISC110

1. Question:

When taking a picture with your phone, does the brand of the phone make a difference in the metadata that is stored in the GPS area when the location is on or off when the phones all use the same carrier?

2. Background Research:

EXIF, or an EXchangeable Image File, is metadata that is stored inside a picture that are taken from our cameras, smartphone, or any device capable of being able to take a picture. EXIF data on an image or picture is data such as the brand of the phone, your GPS location, if the flash was on when you took the picture, the shutter speed and more. EXIF data can be a very dangerous thing. EXIF data can get your GPS location on an image and can allow people to know where you are and when you took a picture. This can be dangerous if you take a picture and upload it to the internet, because people can download your image, and look at all the metadata if you do not know how to get rid of it.

3. Hypothesis:

Taking a picture with different brand phones from the same location in a room at the same object with the same phone carriers is going to provide different results in GPS area of the metadata when adjusting the on/off combinations of GPS, Wi-Fi, and Mobile Data. If the GPS on the phone is off there will be no location results.

4. Testing:

A person will be asked to stand at a certain spot in the room that will be marked by a piece of tape. This process will be performed eight times except with varying differences.

Test Constants: Phone carrier, zoomed out all the way, no flash, same object being photographed

Test Variables: Inside/Outside, Wi-Fi, GPS, Mobile Data, Phone Brand (LG or iPhone)

Test 1: GPS **on**, Wi-Fi **off**, Mobile Data **off**

Test 2: GPS **on**, Wi-Fi **off**, Mobile Data **on**

Test 3: GPS **on**, Wi-Fi **on**, Mobile Data **off**

Test 4: GPS **on**, Wi-Fi **on**, Mobile Data **on**

Test 5: GPS **off**, Wi-Fi **off**, Mobile Data **off**

Test 6: GPS **off**, Wi-Fi **off**, Mobile Data **on**

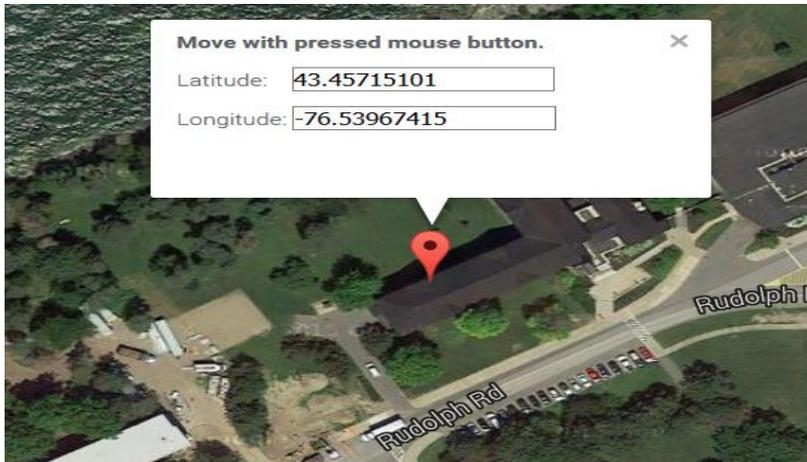
Test 7: GPS **off**, Wi-Fi **on**, Mobile Data **off**

Test 8: GPS **off**, Wi-Fi **on**, Mobile Data **on**

5. Conclusion:

The actual location of the spot the pictures were approximately taken was at Latitude 43.45715101, Longitude -76.53967415. In the tables below, you can see the coordinates of the GPS location from the metadata. The results that the phones would have different locations for the latitude and longitude were accurate. The phones were mostly consistent in each test with itself. Neither phone had the same coordinates as the other, which supports the hypothesis that the phones would have different GPS locations. Only four of the eight tests for both phones allowed access to the GPS. These four times were

when the GPS was on. Therefore, the GPS function in metadata does not function if the GPS services are turned off.



Phone Brand			
Test	GPS	Wi-Fi	Mobile Data
1	Y	Y	Y
2	Y	Y	N
3	Y	N	Y
4	Y	N	N
5	N	Y	Y
6	N	Y	N
7	N	N	Y
8	N	N	N

iPhone	
GPS Latitude	GPS Longitude
43.45709722	-76.53955
43.45709722	-76.53955
43.45709722	-76.53955833
43.45682778	-76.53906944
NO RESULTS	NO RESULTS

Phone Brand			
Test	GPS	Wi-Fi	Mobile Data
1	Y	Y	Y
2	Y	Y	N
3	Y	N	Y
4	Y	N	N
5	N	Y	Y
6	N	Y	N
7	N	N	Y
8	N	N	N

LG	
GPS Latitude	GPS Longitude
43.4571102	-76.539656
43.4571102	-76.539656
43.4571102	-76.539656
43.4571102	-76.539656
NO RESULTS	NO RESULTS