

## gps tracking like a hacker

## Bonus:

Scenario: Your child tells you they are at a friend's house studying after school. The friend's parents are not home from work, so you can't call them to verify. Due to past circumstances, you have an uneasy feeling as to whether or not your child is truly at the friend's house. You ask your child to take a "selfie" with the friend to prove they are actually together. In a few moments you receive a photo on your phone from your child with two smiling faces... your child and the friend. You can now verify the location. Do you want to know how?

- 1. Download exiftool here:
  - a. http://www.sno.phy.queensu.ca/~phil/exiftool/
    - i. Windows or Mac
- 2. Run the executable
- 3. You should end up with an icon on your desktop that looks like this:



a. exiftool(-k)... (background color may not be brown)

- 4. Email the photo on your phone to your email account
- 5. Open your email on the computer with exiftool and download the photo
- 6. Drag and drop the photo onto the camel icon (exiftool only opens when a file is dropped onto the icon)
- 7. A command window will open that looks similar to this:

Exifical Version Number: 8.54Pile Name: photo./PGDirectory: photo./PGForward Presentations/Parent Presentation/1-23-2014 Revamped/DenoPile Star: 173 kBPile Presentations/Parent Presentation/1-23-2014 Revamped/DenoPile Presentations/Parent Presentation/1-23-2014 Revamped/DenoPile Presentations/Parent Presentation/1-23-2014 Revamped/DenoPile PresentationPile PresentationPresolution <th>Desktop</th> <th>p\exiftool(-k).exe</th>	Desktop	p\exiftool(-k).exe
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GPS       fine Stampi       file18:18:00:001         GPS       ing Direction       ing GPS         GPS       ing Direction       ing GPS         Compression       :JPEG (old-style)         Inage Width       :3264         Inage Width       :2264         Inage Width       :2264         Encoding Process       :Baseline DCT, Huffman coding         Bits Per Sampling       :VCbCr4:2:0 (2 2)         Aperture       :2.4         GPS Institude       :22 n Above Sea Level         GPS Institude       :32 deg 20' 1.20" N         GPS Institude       :32 deg 20' 1.20" N      <	GPS Altitude Ref	· Aboue Sea Level
GPS       Ing Direction Ref       : True North         GPS       Ing Direction       : 327.6882353         Compression       : JPEG (old-style)         Thumbnail Length       : 5819         Image Width       : 2448         Encoding Process       : Baseline DCT, Huffman coding         Bits Per Sample       : 8         V CD Components       : 2448         CPS Altitude       : 2448         GPS Ing Direction       : 2448         Bits Per Sample       : 8         V CD Components       : 2448         GPS Ampling       : VCDCr4:2:0 (2 2)         Apperture       : 32 deg 45' 1.20" N         GPS Anglitude       : 32 deg 20' 2.40" W         GPS Abstitude       : 32 deg 20' 2.40" W         GPS Abstitude       : 32 deg 20' 2.40" W         GPS Construct       : 32 deg 20' 2.40" W         Scale Factor To 35 mm Equivalent: 8.2       : 32 deg 45' 1.20" N, 97 deg 20' 2.40" W         Scale Factor To 35 mm Equivalent: 8.2       : 1/20         Thumbnail Image       : 1/20         Thembhail Image       : 0.60M mm         Field Of Usew       : 4.3.3 mm equivalent: 35.0 mm>         Hyperfocal Distance       : 2.40 m         Light Value       : 7.5	GPS Time Stamp	: 15:18:18.89
GPS Ing Direction       : 327.6882353         Compression       : JPEG (cld=style)         Thumbhail Offset       : 902         Thumbhail Length       : 5819         Image Width       : 3264         Encoding Process       : Baseline DCT, Huffman coding         Bits Per Sample       : 8         Color Components       : 3         Y Cb Cr Stub Sampling       : YChCr4:2:0 (2 2)         Aperture       : 24         GPS Indition       : 32 deg 45' 1.20" N         GPS Indition       : 32 deg 45' 1.20" N         GPS Position       : 32 deg 45' 1.20" N, 97 deg 20' 2.40" W         Image Size       : 1/20         Shutter Speed       : 1/20         Thumbhail Image       : 1/20         Shutter Speed       : 4.4 deg         Focal Length       : 4.8 m (35 m equivalent: 35.0 mm)         Light Value       : 7.5	GPS Img Direction Ref	: True North
Compression       : JPEG (cld-style)         Thumbhail Offset <td:902< td="">         Thumbhail Length       <td:902< td="">         Image Midth       <td:314< td="">         Image Midth       <td:3264< td="">         Image Midth       <td:3264< td="">         Else Mg Sample       :8xeline DCT, Huffman coding         Bits Mg Sample       :8xeline DCT, Huffman coding         Bits Mg Sample       :8xeline DCT, Huffman coding         Color Components       :3         V Ch Cr Sub Sampling       :VChCr4:2:8 (2 2)         Aperture       :2.4         GPS Altitude       :32 deg 45' 1.28" N         GPS Latitude       :32 deg 20' 2.48" W         Image Size To 35 mm Equivalent: 8.2         Scale Factor To 35 mm Equivalent: 8.2         Shatter Speed       :1/28         Image Mid Of Usev       : 0.004 mm         Field Of Usev       : 2.408 m         Pocal Length       : 4.3 mm 35 mm equivalent: 35.0 mm)         Light Value       : 7.5        </td:3264<></td:3264<></td:314<></td:902<></td:902<>	GPS Img Direction	: 327.6882353
Thumbhail Length : 702 Image Width : 3264 Image Width : 3264 Image Mightess : 2448 Encoding Process : Baseline DCT, Huffman coding Bits Per Sample : 2.4 Proture : 182 m Above Sea Level CPS Latitude : 182 m Above Sea Level CPS Latitude : 182 m Above Sea Level CPS Latitude : 248 45 1.20" N CPS Longitude : 32 deg 45' 1.20" N Scale Factor To 35 mm Equivalent: 8.2 Shutter Speed : 1.22 Shutter Speed : 1.20 Thumbhail Image : CBinary data 5819 bytes, use -b option to ex Circle Of Confusion : 0.004 mm Field Of View : 54.4 deg Focal Length : 4.3 mm (35 mm equivalent: 35.0 mm) Light Value : 7.5 - press any key	Compression Thumboail Offort	· JPEG (old-style)
Image Width " 3264 Image Hidth : 2448 Encoding Process : Baseline DCT, Huffman coding Bits Per Sample : 8 Color Components : 3 Y Cb Cr Sub Sampling : YCbCr4:2:0 (2 2) Aperture : 2.4 GPS Altitude : 32 deg 45' 1.20" N GPS Position : 32 deg 20' 2.40" U Image Size To 35 mm Equivalent : 8.2 Shutter Speed : 1/20 The Dhnail Image : GBinary data 5819 bytes, use -b option to ex Circle Of Confusion : 9.004 mm Fical Of View : 54.4 deg Focal Length : 2.08 m Hyperfocal Distance : 2.08 m Hyperfocal Distance : 2.08 m Light Value : 7.5 - press any key	Thumbhail Length	5819
Image Height       : 2448         Encoding Process       : Baseline DCT, Huffman coding         Bits Per Sample       : Sampling         YChCr4:2:0 (2 2)       : 2.4         GPS Initiude       : 97 deg 20' 2.40" W         GPS Position       : 32 deg 45' 1.20" N         GPS Position       : 32 deg 45' 1.20" N         Image Size       : 3264x2448         Scale Factor To 35 mm Equivalent: 8.2       : 1/20         Shutter Speed       : 1/20         Shutter Speed       : 0.004 mm         Field Of Usew       : 54.4 deg         Focal Length       : 4.3 mm (35 mm equivalent: 35.0 mm)         Light Value       : 7.5         press any key       : 7.5	Image Width	: 3264
Incoding Process     Baseline DCT, Huffman coding     Bits Per Sample     Sample     Sample     Sample     Sampling     YCbCr4:2:0 (2 2)     YCCCr4:2:0 (2 2)     YCCCCr4:2:0 (2 2)     YCCCCr4:2:0 (2 2)     YCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	Image Height	: 2448
Diss for sample       19         Color Components       1247         Y Gb Cr Sub Sampling       1247         GPS Intitude       132 deg 45' 1.20" N         GPS Latitude       32 deg 20' 2.40" W         Image Size       32 deg 20' 2.40" W         Scale Factor To 35 mm Equivalent: 8.2         Shutter Speed       1.720         Thumbhail Image       1.720         Thumbhail Image       : 0.004 mm         Giel O Confusion       : 0.004 mm         Great Longth       : 4.3 m equivalent: 35.0 mm>         Hyperfocal Distance       : 2.48 m         Light Value       : 7.5         press any key	Encoding Process	Baseline DCT, Huffman coding
Chi Cr Statu Sampling       YChCr412:0 (2 2)         Productive       2.4         CPS       Latitude         Scale Factor To 35 mm Equivalent: 8.2         Shutter Speed       1.20         Shutter Speed       1.20         Chrolo Of Confusion       20.004 mm         Focal Length       4.4.4 deg         Pocal Length       4.3.4 deg         Light Value       2.08 m         Light Value       7.5	Colow Components	- 0
Aperture       : 2.4         GPS Altitude       : 182 m Above Sea Level         GPS Latitude       : 32 deg 45' 1.20" N         GPS Longitude       : 32 deg 20' 2.40" W         GPS Longitude       : 32 deg 20' 2.40" W         Image Size       : 32 deg 45' 1.20" N, 97 deg 20' 2.40" W         Isage Size       : 32 deg 45' 1.20" N, 97 deg 20' 2.40" W         Scale Factor To 35 mm Equivalent: 8.2       : 1/20         Shutter Speed       : 1/20         Thumbhail Image       : 0.004 mm         Field Of Usew       : 4.3 mm 35 mm equivalent: 35.0 mm>         Hyperfocal Distance       : 2.08 m         Light Value       : 7.5	Y Cb Cr Sub Sampling	: YCbCr4:2:0 (2 2)
GPS Altitude       : 182 m fbove Sea Level         GPS Latitude       : 32 deg 45' 1.20" N         GPS Longitude       : 97 deg 20' 2.40" W         GPS Position       : 32 deg 45' 1.20" N         Image Size       : 32 deg 45' 1.20" N         Scale Factor To 35 mm Equivalent: 8.2       Shutter Speed         Thumbhail Image       : 1/20         Circle Of Confusion       : 0.004 mm         Field Of Usev       : 54.4 deg         Focal Length       : 4.3 mm (35 mm equivalent: 35.0 mm)         Light Value       : 7.5         press any key	Aperture	: 2.4
GPS Longitude       32 deg 45 1.20" N         GPS Longitude       32 deg 20 2.40" W         GRS Longitude       32 deg 20 2.40" W         GRS Longitude       32 deg 45 1.20" N, 97 deg 20' 2.40" W         Image Size To 35 mm Equivalent 8.2       32 deg 45' 1.20" N, 97 deg 20' 2.40" W         Scale Factor To 35 mm Equivalent 8.2       1.20" N         State Factor To 35 mm Equivalent 8.2       1.20" N         Scale Factor To 35 mm Equivalent 8.2       1.20" N         Scale Factor To 35 mm Equivalent 8.2       1.20" N         Circle Of Confusion       1.20 M mm         Focal Length       1.4.3 mm (35 mm equivalent: 35.0 mm)         Light Value       2.08 m         press any key       7.5	GPS Altitude	: 182 m Above Sea Level
RYS bong taken (2007) (RYS Position : 22 deg 45' 1.20' N, 97 deg 20' 2.40' W Image Size Scale Factor To 35 mm Equivalent: 8.2 Shutter Speed : 1/20 Thumbhail Image : (Binary data 5819 bytes, use -b option to ex act) : 0.004 mm Field Of View : 54.4 deg Focal Length : 4.3 mm (35 mm equivalent: 35.0 mm) Hyperfocal Distance : 2.00 m Hyperfocal Distance : 7.5 - press any key	GPS Lapritude	- 32 aeg 45' 1.20" N
Image Size : 23264x2448 Scale Factor To 35 mm Equivalent: 8.2 Shutter Speed : 1/20 Thumbhail Image : (Binary data 5819 bytes, use -b option to ex act) : (Binary data 5819 bytes, use -b option to ex act) : (Binary data 5819 bytes, use -b option to ex Gircle Of Confusion : 0.004 mm Field Of View : 54.4 deg Focal Length : 4.3 mm (35 mm equivalent: 35.0 mm) Hyperfocal Distance : 2.08 m Light Value : 7.5 press any key	GPS Position	: 32 deg 45' 1.20" N. 97 deg 20' 2.40" V
Scale Factor To 35 mm Equivalent: 8.2 Shutter Speed : 1/20 Thumbnail Image : (Binary data 5819 bytes, use -b option to ex act) : 96 Confusion : 0.004 mm Field Of View : 54.4 deg Focal Length : 4.3 mm (35 mm equivalent: 35.0 mm) Hyperfocal Distance : 2.00 m Light Value : 7.5 - press any key	Image Size	: 3264×2448
Shutter Speed : 1/20 Thumbhail Image : (Binary data 5819 bytes, use -b option to ex act> Gircle Of Confusion : 0.004 mm Field Of Uiew : 54.4 deg Focal Length : 4.3 mm (35 mm equivalent: 35.0 mm) Hyperfocal Distance : 2.08 m Light Value : 7.5 press any key	Scale Factor To 35 mm Equivalen	t: 8.2
Analysian frage - Contary data 3017 Bytes, dis -B option to ex Ciscle Of Confusion : 0.004 mm Picld Of Usew : 54.4 deg Pocal Length : 4.3 mm (35 mm equivalent: 35.0 mm) Hyperfocal Distance : 2.08 m Hyperfocal Distance : 7.5 press any key	Shutter Speed Thumboail Image	: 1/20 : (Binamy data 5819 butes use -b option to out
Circle Of Confusion : 0.004 mm Field Of Uiew : 54.4 deg Focal Length : 4.3 mm (35 mm equivalent: 35.0 mm) Hyperfocal Distance : 2.08 m Light Value : 7.5 press any key	act)	- (binary data saly bytes, use -b option to ext
Field Of Uiew : 54.4 deg Pocal Length : 4.3 mm (35 mm equivalent: 35.0 mm) Hyperfocal Distance : 2.00 m Light Value : 7.5 press any key	Circle Of Confusion	: 0.004 mm
Focal Length : 4.3 mm (35 mm equivalent: 35.0 mm) Hyperfocal Distance : 2.08 m Light Value : 7.5 — press any key	Field Of View	: 54.4 deg
Hypervocal Distance : 2.08 % Light Value : 7.5 press any key	Focal Length	: 4.3 mm (35 mm equivalent: 35.0 mm)
press any key	Light Halue	- 2.00 m - 7.5
	press any key	

- b. I added the red arrow as this is the information you will need
- 8. Resize the window if needed and scroll toward the bottom of the information. You will see GPS information. Write down the Latitude and Longitude Information.
  - a. In my example it would be the following:
    - i. Lat 32 45 1.2
    - ii. Lon 97 20 2.4
- 9. Go to this website:
  - a. <u>http://transition.fcc.gov/mb/audio/bickel/DDDMMSS-decimal.html</u>
  - b. Under "Degrees Minutes Seconds to Decimal Degrees" enter your latitude and longitude information (broken into three parts as I have listed above into the three separate fields for each) into the converter and click "Convert to Decimal"
  - c. Your output should look like this:

## **Degrees Minutes Seconds to Decimal Degrees**

i.

Enter Degrees Minutes Seconds latitude:		32	45	1.2		
Enter Degrees Minutes Seconds longitude:		97	20	2.4		
Convert to Decimal Clear Values						
Results: Latitude: 32.750333 Longitud		e: 97	.334			

- d. In another tab on your browser, go to http://maps.google.com
- e. Copy the decimal degree from Latitude and Paste into the search field, then add a comma and space
- f. Copy the decimal degree from the Longitude field and paste just after the comma in the search field
- g. Add a negative sign to the Longitude number
- h. Your search on maps.google.com should look like this:

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2	L

- ii. Don't forget the negative Longitude value or you will end up on the other side of the world! Literally, it will look like the location is somewhere in the mountains just over ten miles southeast of Yushu, China.
- i. Click the blue box with magnifying glass to search (or hit enter)

Using the photo I took as an example, the coordinates would place you at Burnett Plaza in downtown Fort Worth, TX. Of course, the location of your child's photo will more than likely be different. Looking at my example, you will see the location looks to be several meters away from the building; however, is still relatively close. I would suggest you play around with taking a picture in your home, map it, and see where it puts you. A few meters off here and there is normal. It may look like you took the picture in your backyard when you actually took it in the front room of the house. That is normal. If it appears your child is in the general area (within 200 feet) of the friend's house, you have nothing to worry about. If it looks like they are a block or more away from that location, then worry.

I sincerely hope you found this information useful. Please remember that technology changes at a very fast pace. The information contained in this handout will not remain fresh forever. My analysis of products and my recommendations are based on the information current as of beginning of the year, 2014. I would encourage you to search for reviews on reputable sites such as Cnet and PC Magazine. These

sites have expert reviewers whose only job is to find, test, and review products and devices.

For additional information on keeping your children protected online, please visit the following links:

http://www.fbi.gov/stats-services/publications/parent-guide

http://www.safekids.com/child-safety-on-the-information-highway/

http://kidshealth.org/parent/positive/family/net\_safety.html

http://www.scholastic.com/parents/resources/article/your-child-technology/keeping-kids-safe-online