



# Geotagging e Privacy Locazionale: Vantaggi e Rischi

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# Contenuti

- Geotagging
- Profili tecnologici
- Profili giuridici: Privacy Locazionale
- Profili giuridici: Vantaggi e Rischi
- Conclusioni



# Geotagging

- L'inserzione di metadata geografici all'interno di vari supporti, come documenti, messaggi, video o fotografie
- Le informazioni di localizzazione possono consistere in coordinate di altitudine, latitudine, altitudine, distanza...
- Espande la *digital forensics al mobile world*



# Profili tecnologici - I

- Global Positioning Systems (GPS); GNSS; AGPS
- Connessione a reti wifi (WPS) o in base a indirizzo IP
- Geo-location Services: *Foursquare, Yowza!!, Flickr, YouTube, Twitter e PicFog, Google Location Service ...*
- Metadata: *EXIF formats...*

# Profili tecnologici - II

## Profile of US Mobile Wi-Fi Users Who Location-Tag Their Social Media Posts/Photos, by Social Network, Q2 2012

*% of respondents*

Facebook	Instagram
<b>60%</b> ages 25-54	<b>64%</b> ages 21-44
<b>56%</b> plan to shop online this holiday season	<b>37%</b> use their smartphone every time they shop in-store
<b>48%</b> location-tag to notify family and friends	<b>19%</b> plan to do holiday shopping on their smartphone
Twitter	Google+
<b>66%</b> ages 25-54	<b>70%</b> ages 35+
<b>63%</b> plan to use their mobile devices more this holiday season than last year	<b>63%</b> male
<b>57%</b> respond to ads that are locally-relevant	<b>56%</b> have kids age 22 or under
	<b>46%</b> own a tablet

Source: Jiwire, "Mobile Audience Insights Report: Q2 2012," Aug 1, 2012

143849

[www.eMarketer.com](http://www.eMarketer.com)



# Profili tecnologici - III

- Strumenti
  - *Metadata removal tool*
  - *Photo privacy management tool*
  - ...
- Acquisizione forense
  - Firma digitale
  - Marca temporale



# Privacy locazionale

- *Locational privacy* è la capacità di un individuo di muoversi in uno spazio pubblico con la aspettativa che, in circostanze normali, la sua localizzazione non sarà sistematicamente e segretamente registrata per ulteriori usi (Electronic Frontier Foundation)

BLUMBERG A.; ECKERSLEY P., *On Locational Privacy, and How to Avoid Losing it Forever*, in “EFF”, 2009, in <https://www.eff.org/wp/locational-privacy>



# Privacy locazionale e libertà dal governo

- Obiezioni: «*Nothing to hide*»
- Questa argomentazione «*represents a singular and narrow way of conceiving of privacy that when confronted with the plurality of privacy problems implicated by government data collection and use beyond surveillance and disclosure, in the end, has nothing to say.*»

SOLOVE, D. J., *I've Got Nothing to Hide and Other Misunderstandings of Privacy*. San Diego Law Review, Vol. 44, p. 745, 2007; GWU Law School Public Law Research Paper No. 289; in <http://ssrn.com/abstract=998565>





# Privacy locazionale in Europa - I

- Direttiva 95/46/EC: protezione dei dati personali
- Direttiva 2002/58/EC: vita privata e comunicazioni elettroniche
  - Dato relativo al traffico «*qualsiasi dato sottoposto a trattamento ai fini della trasmissione di una comunicazione su una rete di comunicazione elettronica o della relativa fatturazione*» (Art 2, b Direttiva 2002/58/EC)
  - Dato relativo all'ubicazione è «*ogni dato trattato in una rete di comunicazione elettronica che indichi la posizione geografica dell'apparecchiatura terminale dell'utente di un servizio di comunicazione elettronica accessibile al pubblico*» (Art 2, c Direttiva 2002/58/EC)

# Privacy locazionale in Europa - II



Trattamento dei dati (Art 5, 6, 9 Direttiva 2002/58/EC):

1. Confidenzialità
2. Necessità
3. Consenso dell'utente / anonimato

DAMIANI M. L., PERRI P., *Privacy issues in location-aware browsing*, in Privacy issues in location-aware browsing, 3rd ACM SIGSPATIAL international workshop on security and privacy in GIS and LBS, November 2, 2010, San Jose



# Privacy in Italia

- L. 31 dicembre 1996, n. 675
- D. Lgs. 30 giugno 2003, n. 196 (Testo Unico sulla Privacy)



# Vantaggi

## Esempio da *Magnet Forensics*

- *Facebook Chat*
- *Google Maps*
- *Gmail*

SALIBA J., *Using Geolocation Artifacts and Timeline Analysis to Solve the Case: A Digital Forensics Case Study*, in [Magnet Forensics](#), 11 Dec 2013, 11:00am GMT

# Esempio - I



## Facebook Chat

- Used to be left behind on the hard drive in temporary text files, only a few formats
- Now mainly found in live RAM captures (more reason to do them!), and the pagefile.sys and hiberfil.sys files.
- Multiple formats, "emails" and chat blending formats



# Esempio - II

## Google Maps

- Depending on the browser used, URLs may or may not be found in web history records
- However, data is left behind containing URLs and other data regarding the addresses searched / directions obtained
- Can be found in live RAM, pagefile.sys, hiberfil.sys, temporary internet files, and unallocated space
- Useful in many types of cases (homicides, child luring, terrorism) to see where someone was searching on a map or getting directions to

# Esempio - III



## Gmail Webmail

- Traces of data seen in the Inbox view left behind, sometimes full messages as well
- Found in live RAM (again! 😊), the pagefile.sys / hiberfil.sys, and sometimes unallocated space / temporary internet files



# Esempio foto da smartphone - I



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	<p>ComponentsConfiguration: YCbCr  ISO Speed Ratings: 320  Exposure Time: 1/15 s  White Balance: Auto  Lens Make: Apple</p>
IMAGE	<p>YResolution: 72  ResolutionUnit: inch  Orientation: top, left  Make: Apple  GPSTag: 1524  DateTime: 2014:03:24 15:04:38  YCbCrPositioning: Centered  XResolution: 72  Model: iPhone 5s  Software: 7.1  ExifTag: 198</p>
THUMBNAIL	<p>YResolution: 72  ResolutionUnit: inch  Compression: JPEG (old-style)  XResolution: 72  JPEGInterchangeFormatLength: 11009  JPEGInterchangeFormat: 1788</p>
GPSINFO	<p>GPSTimeStamp: 14:04:35.2  GPSLongitude: 11deg 20' 50.670"  GPSLatitudeRef: North  GPSAltitude: 33.2 m  GPSLatitude: 44deg 32' 4.410"  GPSLongitudeRef: East  GPSAltitudeRef: Above sea level</p>

(Michele Ferrazzano, [www.periziainformatica.it](http://www.periziainformatica.it))



# Esempio foto da smartphone - II

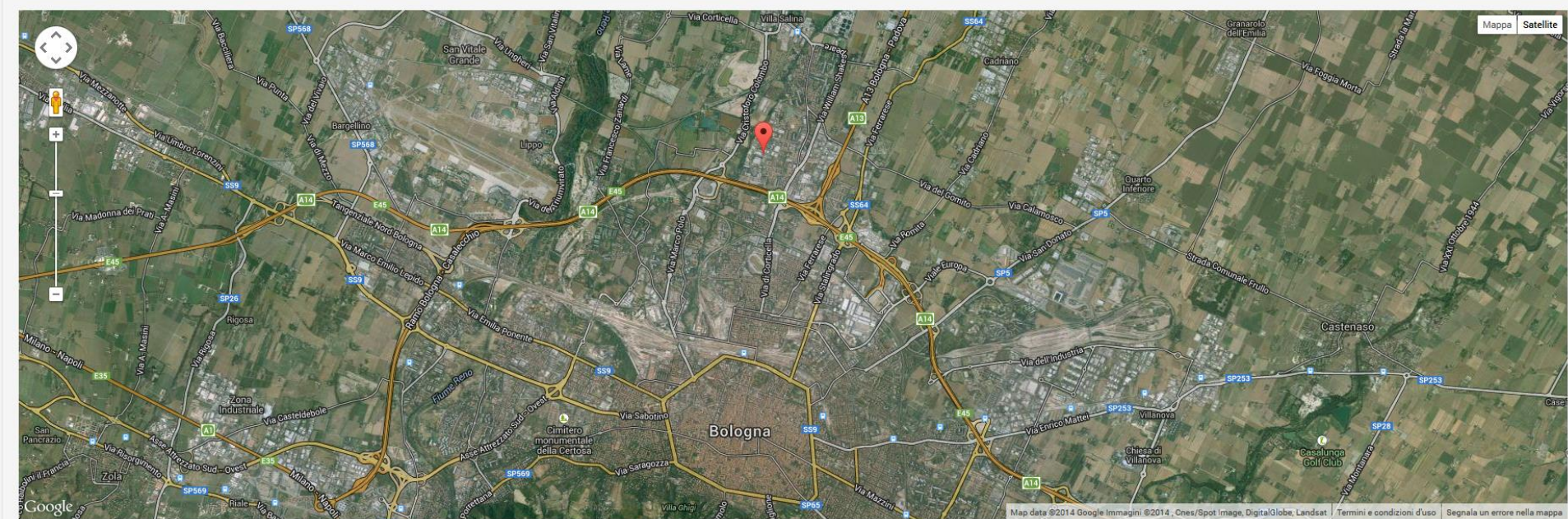


Image analysis: 7b1ac546e17025f8a5c6861126acf7e3

Submitted at: March 24, 2014, 4:24 p.m.

Dashboard Static EXIF Thumb **Map** ELA Signatures

## GPS Localization



(Michele Ferrazzano, [www.periziainformatica.it](http://www.periziainformatica.it))



# Pericoli

- Cyber-stalking
- Cyber-casing: *the use of geo-tagged information available online to mount real-world attacks*
- Altri pericoli: geo-localizzazione in luoghi di vacanza, condivisione online di foto scattate in abitazioni di celebrità o terzi...

FRIEDLAND G., SOMMER R., *Cybercasing the Joint: On the Privacy Implications of Geo-Tagging*, in [http://www1.icsi.berkeley.edu/~fractor/papers/friedland\\_112.pdf](http://www1.icsi.berkeley.edu/~fractor/papers/friedland_112.pdf)



# Conclusioni

- Digital Forensics
- Privacy locazionale
- Ingenuità degli utenti
- Over-sharing
- Cybercasing



*Be sociable but always be smart!*

Grazie

