Geolocation: more than meets the eye

Robin Taylor
What we’ll be looking at today

- Brief introduction about myself
- What is geolocation?
- How is geolocation used in investigations?
- Methodology
- Some of my favorite geolocation examples
- Questions & Practice
A little bit about myself

• Tibet Research Project
• Research masters in Criminology w/ a focus on citizen investigations and visual evidence
Geolocation

- The practice of identifying the geographical location of an image or video
How have I used geolocation?

- Geolocating prisons
- Names, a picture, a county...
- Sometimes there are several prisons within the city district or area
my #1 tool:

Google Earth Pro
Role of geolocation in investigations

- **Disinformation**
  - Fact finding

- **Supportive role**
  - Verifying the location of a person in a certain country/city/village

- **The investigation (Tibet Research Project)**
  - Geolocation is all you set out to do
Turkey claimed they found a mass grave of people killed by the YPG in Afrin.

Geolocation and OSINT work showed that the site had been bulldozed by Turkish forces and later ‘found’.
Missing person

- Bellingcat piece by Carlo Gonzales geolocated these images connected to a missing person (April 2021)
Tigray, Ethiopia (April 2021)
Geolocation in investigations are rarely straightforward.
Methodology: reducing your area of interest

- Context
- Image analysis
- Map markings
- Trial and error
- Be creative

Be creative
Context

- Who posted?
- Where was it posted?
- Your investigation also serves as context

- Metadata = jackpot
Metadata = jackpot

- Contains information about the image
  - Time, date, location, type of camera, width, etc.
- Rare...
Image analysis

- Foreground – Background analysis
- Identifying POIs
- Reverse image search
Image analysis: Nyalam Prison
Reverse image search
Google vs Yandex

Language - Wikipedia
A language is a structured system of communication used by humans, based on speech and gesture (spoken language), sign, or often writing.

language | Definition, Types, Characteristics, & Facts | Britannica
Language, a system of conventional spoken, manual (signed), or written symbols by means of which human beings express themselves. The functions of language ...
Map markings
What is not in your image/video

“the beer of the Bahamas”
How can that help?
Trial and error

• Sometimes you need to revisit previous assumptions
• Perhaps the beer is sold in other countries?
• Islands just out of view?
• Tunnel vision
Be creative

• Jacopo de’ Barbari’s map of Venice (1500)
Leonardo da Vinci’s map of Imola, Italy (1502)

- Perhaps the first ichnographic map
- Satellite map without a satellite
Working through limitations w/ creative solutions

- Sources (important)
- Many map sources beyond Google Maps
- Open source data (city)
- No one method fits all
Missing person case
Missing person case
The killing of Rouzan Al-Najjar (Forensic Architecture)
Geolocate where Rouzan was shot from
Using sun & shadows for geolocation
SunCalc

- Reverse image search didn’t work
- Using the sun to establish the direction of the road
Bellingcat’s MH17 investigation: BUK Convoy

- Tracking the BUK and its path using social media, dashcams, etc.
- 19 month geolocation investigation
Crowdsourcing for geolocation

- Crowdsourcing seven videos of executions by Libyan commander Werfalli
- ICC warrant & problems of verifiability
- Twitter user suggested the colour of the sand indicated this image was taken in South-West Bengazhi
- Online community
How to get started?

• Geoguessr
• Tutorials (Bellingcat, YouTube, etc.)
• @Quiztime on twitter

• I have created a folder with images for you to geolocate, if you’d like to try just let me know!
Questions?

Twitter: @robintayyy
Email: robintayyy@icloud.com
Mentioned investigations

Tibet Research Project
www.tibetresearchproject.org

Missing person investigation by Carlo Gonzales

‘Mahbere Dego’ Tigray, Ethiopia investigation

The Killing of Rouzan Al-Najjar
https://forensic-architecture.org/investigation/the-killing-of-rouzan-al-najjar

Bellingcat’s MH17 Investigation
https://www.bellingcat.com/tag/mh17/

Werfalli geolocation
https://www.bellingcat.com/news/mena/2017/10/03/how-an-execution-site-was-geolocated/

Using Shadows to establish time/date
https://medium.com/quiztime/lining-up-shadows-2351ae106cec