Fine-Grained Censorship Mapping - Information Sources, Legality and Ethics

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Censorship

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- China’s “Golden Shield” is the classic example.
  - Saudi Arabia presents perhaps the most extreme filtering regime. (OpenNet Initiative)
- Many different technologies; many different filtering targets; many different rationales and justifications.
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  - DNS Tampering
  - IP Header Filtering (address or protocol)
  - IP Content Filtering (keyword or protocol)
  - Proxy Filtering

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Limitations

- There are limitations to filtering technologies.
- A rough tradeoff between subtlety of approach and computational requirements.
  - In general, more sophisticated methods require greater computational resources.
  - At a national scale, these can become severe.
- Centralization of filtering can cause a variety of problems, as seen with the CleanFeed filter implemented by BT in the UK.
- Centrally managing filtering can also raise significant administrative and organizational burdens.
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Localized Filtering

- Countries may delegate filtering to ISPs or local areas, either for efficiency or to specifically allow localized control.
- We can already observe location-specific choices of filtering in response to local events.
- We therefore expect to see differences in filtering across a state, rather than homogeneous national filtering.
  - Naturally, we also expect filtering to vary over time.
  - We may also expect organizations to have one filtering regime, even across a state.
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- Two major existing projects examine filtering:
  - HERDICT: crowdsources filtering information from volunteer web users.
  - OpenNet Initiative: have used a variety of sources, including volunteers and direct investigation as well as direct technical means, to examine filtering around the world.

- Both, to some extent, consider national-level filtering as homogeneous.

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- Visitors to the website, or users of the plugin, can report sites that appear blocked.
- The website actively presents potentially blocked content, allowing users to verify if it is blocked.
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- The problem is therefore to get a large number of readings from a wide geographical distribution.
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  - Undirected, inconsistent coverage.
- Direct investigation is expensive.
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- Direct access to other connections is possible in some limited cases.
  - Tor exit nodes, and similar services such as psiphon.
  - VPN services or remote shells.
  - Creatively-used public services – webservers, IRC, bittorrent...
- Access to DNS is very simple, and directly addresses one major type of filtering.
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  - China seems to offer no exit nodes. Much of Africa and the Middle East is the same.
  - No-one wants to run Tor-like services in highly filtered areas!
- VPN services are also rare, and usually paid. Remote shells are even more so.
  - Similarly to Tor, these services are typically offered to get past filtering, not get in.
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- If only we could... botnets.
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A variety of legal and ethical questions have already been raised in this talk.

- Is it legal to access blocked websites?
- Is it ethical to ask someone else to access blocked websites?
  - Questions of consent for automated tools or websites.
- Is it legal to creatively abuse a public service? (For the specific purpose of detecting or, potentially, bypassing filtering?)
  - Is it ethical to potentially open a service operator to repercussions based around such misuse?
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- Some sites are blocked for serious legal or societal reasons:
  - Pornography, homosexuality, lèse majesté, insult to religion

- Reporting such sites as blocked may well be legal, but detection through access attempts may cause legal, pseudo-legal or social consequences.

- When is the risk too small, and how can we judge this against arbitrary cultural contexts?
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- Selected the top 80 reported blocked websites according to HERDICT.
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Early Observations

Results have not yet been analysed, but some initial observations:

- Many blocked sites are listed as non-existent in the majority of DNS servers tested.
- Several servers return no result for most blocked sites, but occasionally redirect requests to other DNS servers before doing so.
  - One server in Zhongxin returns a normal response for baidu.com.cn, but redirects to a Beijing server when asked about wujie.net, which then returns no result.
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  - vujie.net is redirected to a number of IPs, but 161 servers that returned a response directed to only 9 separate IPs – none of which appear to offer services, and are apparently unrelated to vujie.net.
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  - Specifically, public services rather than individual services.
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