

The Web of Cognitive Warfare

By

Jindrich Karasek aka [4n6strider](#)



TLP:GREEN / All slides



Adversary: Syndicated cyber crime gangs and the APT actor

Capabilities:

Data mining, sociomapping, microtargeting, use of doppelganger media pages, algorithm-driven content feeds.



Infra:

Social media platforms, marketing tools, website traffic analysis, cloud-based data storage, and trackers.

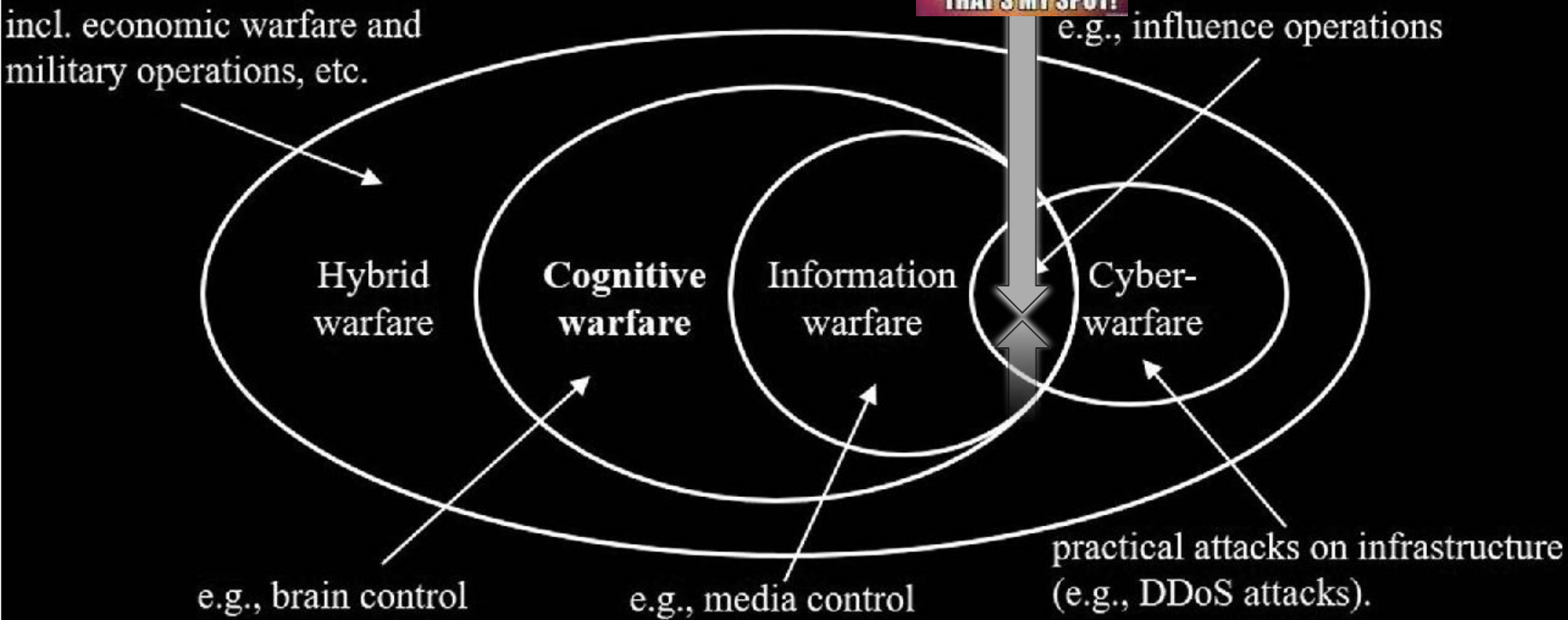
Victim: General public, in “enemy” countries

Plan:

- The Big picture
- OODA: Observe
- OODA: Orient
- OODA: Decide
- OODA: Act
- Conclusion



Big picture:



OBSERVE

Continuous monitoring of social media and web traffic
Identifying indicators of manipulation (e.g., sock puppet accounts, paid ads)
Using OSINT for comprehensive threat landscape awareness



ORIENT

Sociomapping to understand network influences
Analyzing data for behavioral patterns and relationships
Identifying cognitive biases and manipulation tactics
Sentiment analysis to gauge public sentiment
Named Entity Recognition (NER) to identify key actors
Topic Modeling to uncover hidden themes



DECIDE

Developing targeted countermeasures
Crafting communication strategies to counter misinformation
Planning educational initiatives to raise awareness



ACT

Deploying countermeasures and protective actions
Launching public awareness campaigns
Utilizing ethical hacking to test and strengthen defenses



OODA Loop

OODA 1/4 : Observe

Continuous monitoring of social media and web traffic, Identifying indicators of manipulation (e.g., sock puppet accounts, paid ads), Using OSINT for comprehensive threat landscape awareness

Why the Web?

It is everywhere. Good.



UX dark patterns

Manipulative design tactics.

Misinformation loops
Echo Chambers
Information Overload
Fear Appeals
Intermittent Variable Rewards
False Consensus Effect
Hidden Information and Choices

=> **Recognition of dark patterns** is essential in safeguarding democratic integrity and promotion of informed decision making.



Phenomena

- {Explained in **Appendix**}
- Narrative
- Overton Window
- Meme
- Fear
- Cognitive biases
- Persuasion
- Dark Patterns in UX
- Social Identity
- Group Thinking
- Decisions by emotions
- Belief change
- Cognitive capacity



[Caution: This slide is all hoaxes!]

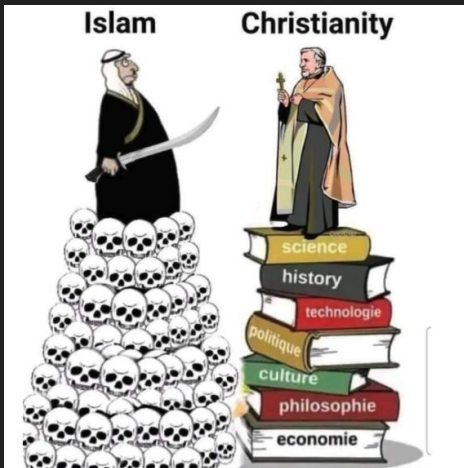
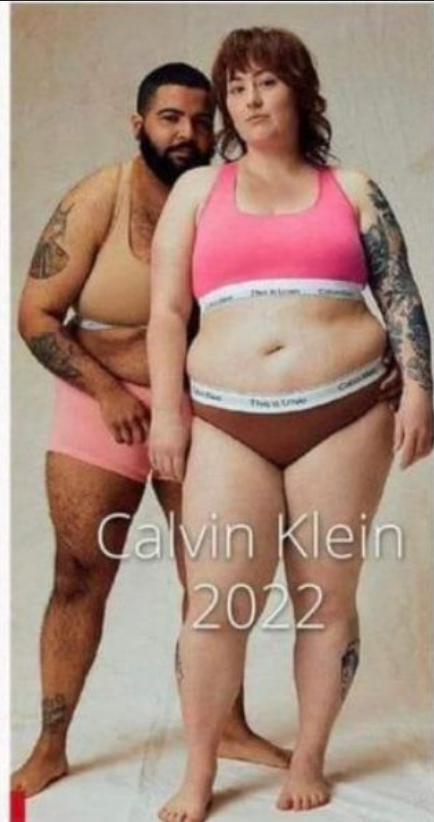
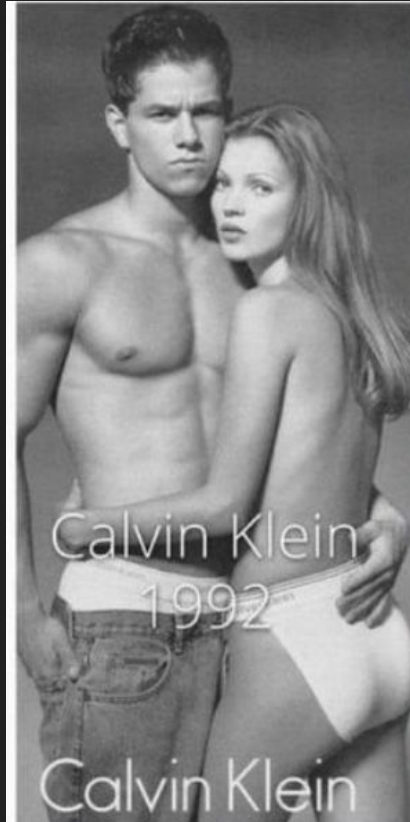
Embassy of Russia in Bangladesh

2 d ·

Alexander Dugin

(https://t.me/Dugin_Aleksandr):

At the heart of the global confrontation that has begun is the spiritual,... Zobrazit vic



Ongoing PsyOP in Czechia:

Andrej Babiš • Yesterday at 9:45am • 🌐

Viděli jste kurz bitcoinu? Jsem si jistý, že nyní je ten správný čas investovat do kryptoměn. A já už jsem to na své finanční platformě Immediate Matrix udělal.

👍👎👏 5.1k

210 Comments 103 Shares

News Corner

News Corner

Děkujeme za zanechání žádosti

Očekávejte telefonát od našeho odborníka, který vás bude brzy kontaktovat!

📧 Vaše odpovědi jsou odeslány.

Grand Design Studio

Jak bylo oznámeno, byl podepsán nový zákon

Congratulations!

Don't miss our call

Wait for a call within 24 hours - don't miss that call, otherwise another system participant may get your place!

03. 03. 2024

ANDREJ BABIŠ

LUBOŠ XAVER VESELÝ

XAVER S HOSTEM

BUDE LIP

IMMEDIATE NEXUS

FUTURESTEP.JPRO

World of Law Sponsored

You've been scammed by broker or fell into another type of scam... [more](#)

IS YOUR BROKER A SCAMMER?

WE'LL GET YOUR MONEY BACK WITHIN 7 DAYS AND WITHOUT PREPAYMENT!

FREE CONSULTATION

WE'LL GET YOUR MONEY BACK WITHIN 7 DAYS [APPLY NOW](#) PREPAYMENT

FREE CONSULTATION



POZOR

Šéf kontrarozvědky Michal Koudelka sdělil o úspěšné operaci na chytání internetových podvodníků. České úřady zahájí rychlé odškodnění všem poškozeným v důsledku činnosti podvodníků

ZPRÁVY

Pijete finančních prostředků na účet: +47153 CZK

ZPRÁVY

Pijete finančních prostředků na účet: +46908 CZK

ZPRÁVY

Pijete finančních prostředků na účet: +68451 CZK

PLATÍM VÁM VAŠE VÝDAJE POKUD NEVYDĚLÁTE 500 000 CZK DO 3 MĚSÍCŮ!

Téma: Kryptoměny a Filip Kalčák a Václav Toman

Immed Enigma

Process: Data mining, sociomapping & microtargeting

1) Paid Ads promotion:

Social media:
Use of doppelganger media
pages



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Promoted by sock puppet
accounts - comments, likes



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Harvesting of the data using the forms, scripts and usual marketing tools and website traffic analysis



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Data are sent to third party servers in Cloud, javascripts use often trackers of Yandex, Facebook or Google



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4) Output:

The actor has detailed personal info about audience, their relations and has a financial gain if the scam succeeded.



OODA 2/4: Orient

OSINT, mapping to understand network influences, Analyzing data for behavioral patterns and relationships, Identifying cognitive biases and manipulation tactics, Sentiment analysis to gauge public sentiment, Named Entity Recognition (NER) to identify key actors, Topic Modeling to uncover hidden themes

Česká rep... ▾

Všechny reklamy ▾

🔍 babiš

✕

🔖 Uložená hledání

🔼 Filtry

🔖 Uložit hledání

Spuštěno: květen 2024

17. 5. 2024 až 17. 5. 2024

Platformy 🌐 📺 🗣️ 🗣️

Transparentnost v EU ⓘ

Zobrazit podrobnosti o reklamě



Encantos del Mundo

Sponzorováno



Obsah jsme odebrali, protože porušuje naše [zásady pro reklamu](#).

17. 5. 2024 až 17. 5. 2024

Platformy 🌐 🗣️ 🗣️

Transparentnost v EU ⓘ

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VnLP

Sponzorováno

"Vždycky jsem se snažil pomáhat lidem k úspěchu - naše platforma je tou ztratkou k němu." (c) Andrej Babiš.
Nová platforma je schopna zachránit každého v České republice před všemi finančními potížemi. Už žádné přemýšlení, je čas jednat!



WWW.MATCHOFSUCCESSNEWS.COM
Máte poslední sancí

Další inform...

16. 5. 2024 až 16. 5. 2024

Platformy 🌐 📺 🗣️ 🗣️

3 reklamy používají tento obsah a text

Zobrazit souhrnné podrobnosti



Popstock! Portugal

Sponzorováno



ID knihovny: 974707584354146

🔒 Neaktivní

16. 5. 2024 až 16. 5. 2024

Platformy 🌐 📺 🗣️ 🗣️

2 reklamy používají tento obsah a text

Zobrazit souhrnné podrobnosti

16. 5. 2024 až 16. 5. 2024

Platformy 🌐 📺 🗣️ 🗣️

Tato reklama má několik verzí. ⓘ

Transparentnost v EU ⓘ

Zobrazit podrobnosti o reklamě



NewsCentr

Sponzorováno



Obsah jsme odebrali, protože porušuje naše [zásady pro reklamu](#).

Doručování reklam v EU

Dosah

11 722

Zobrazit podrobnosti o reklamě

ID knihovny: 2438260156385237

🔒 Neaktivní

15. 5. 2024 až 17. 5. 2024

Platformy 🌐 📺 🗣️ 🗣️

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Platformy 🌐 📺 🗣️ 🗣️

2 reklamy používají tento obsah a text

Zobrazit souhrnné podrobnosti

Věk ⓘ

35 – 65 + let

Zobrazit podrobnosti o reklamě

Narrative intelligence: 4 AI/ NLP Tricks:

- NER
- POS
- Topic Modeling
- Sentiment Analysis

Automation saves time and
protects the sanity of
analysts.



AI comes to save the day. Well, the NLP.

- **Sentiment analysis** => hate speech detection

@JohnPowe14 Putin a criminal! @Russia do you support that? Stand with @ukraine! #StandWithUkraine

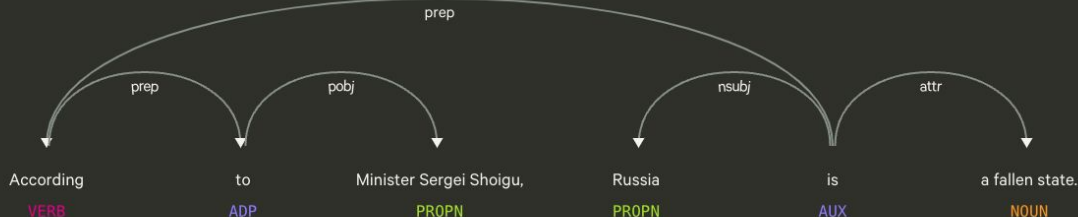
```
{'polarity': -0.625, 'subjectivity': 0.55, 'assessments': [[('criminal', '!', '!'), -0.625, 0.55, None]]}
```

- Detection of the **named entity** => what's going on

Russian **NORP** President Vladimir Putin **PERSON** has repeatedly declared that "the Ukrainian **NORP** operation has failed." According to Russian **NORP** Defense Minister Sergei Shoigu **PERSON**, Moscow **GPE** 's losses from the start of the offensive to the end of October **DATE** exceeded 90,000 people.

- **POS**: parts of speech:

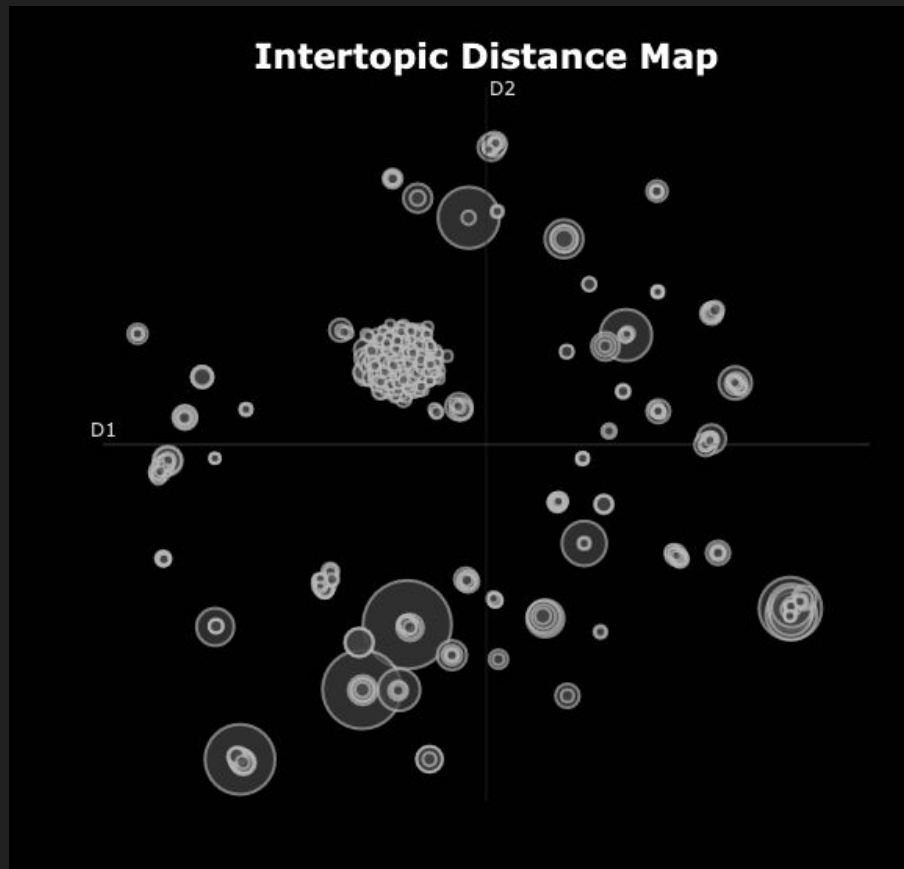
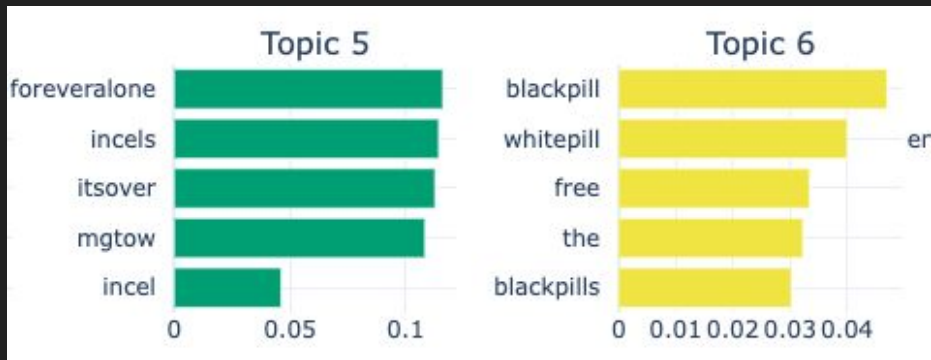
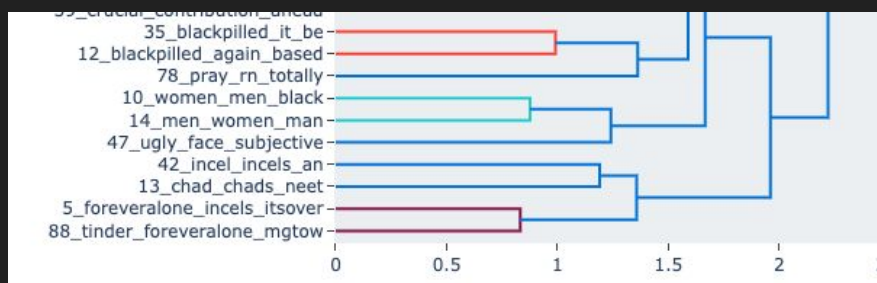
4 tricks you should know about



AI TRICK: Topic Modeling

{Topic modeling with Google BERT}

$$\phi(\text{"king"}) - \phi(\text{"man"}) + \phi(\text{"woman"}) = \phi(\text{"queen"})$$



Ethical hacking



První zákon Petra Pavla o zajištění finančního zabezpečení občanů – přijat

pondělí 28. srpna 2023 – Praha
[Lukáš Zaccpal](#)



```
https://connect.facebook.net/signals/config/765819157890167?v=2.9.125&r=stable&domain=news.ceska.kantaapnews.comhttps://connect.facebo
ok.net/en_US/fbevents.js
!function(f,b,e,v,n,t,s){if(f.fbq)return;n=f.fbq=function(){n.callMethod?
n.callMethod.apply(n,arguments):n.queue.push(arguments)};if(!f._fbq)n
.n.push=n;n.loaded=!0;n.version='2.0';n.queue=[];t=b.createElement(e);t.async=!0;
t.src=v;s=b.getElementsByTagName(e)[0];s.parentNode.insertBefore(t,s)}(window,
document,'script','https://connect.facebook.net/en_US/fbevents.js');
fbq('init', '90167');
fbq('track', 'AddToCart');
```

KryspinGroup Trade Platform

Úroveň marže 0% Použitá marže: 0 Kapitál: \$0.00 Balance: \$0.00 Naser Teei Usau VKLAD
Dostupné marže: \$0.00 P/L: \$0.00 Kredit: \$0.00 15cm@gmail.com

Hledat Všechny

BTC/USD 5m GOOG 5m AAPL 5m TSLA 5m **_BMW.DE 5m**

Active Prodejní certifikákní cena

AUD/CHF	0.56796	0.56823
AUD/JPY	94.157	94.178
AUD/NZD	1.08712	1.08748
AUD/USD	0.64235	0.64246
CAD/CHF	0.65127	0.65158
CAD/JPY	107.976	107.976
CHF/HUF	400.75	401.38
CHF/JPY	165.747	165.772
EUR/AUD	1.68248	1.68272
EUR/CAD	1.46715	1.46748
EUR/CHF	0.95575	0.95597
EUR/DKK	7.4519	7.4534
EUR/GBP	0.85902	0.85917
EUR/HUF	383.15	383.37
EUR/ILS	4.1045	4.1045
EUR/JPY	158.496	158.494

_BMW.DE - 5 096.640 H96.640 L96.620 C96.620 -0.030 (-0.03%)

Objem 1

Investice \$1 045.77
Cena položky 1.08
Ramenec 1:10
Rozšíření 0 pips
Swap Buy -2.81
Swap Sell -2.81
Minimální krok 0.01

SELL 96.62 BUY 96.76

Take profit 0 \$
Stop loss 0 \$

Otevřené pozice (0) Čekající pozice (0) Uzavřené pozice (0)

Symbol Sell Buy

Objem Počáteční cena Aktuální kurz Take Profit Stop Loss Výměna Zisk \$

V tabulce nejsou k dispozici žádné údaje

ČESKÉ ELEKTRÁRNY SPOUŠTĚJÍ PROGRAM PODPORY OBČANŮ

first_name is required

Jméno

last_name is required

Příjmení

email is required

Tvůj e-mails

phone must be a valid phone number

+420 + 601123 456

Poslat zprávu



Snažili jsme se, aby náš produkt byl jedinečný a užitečný.

```
<!DOCTYPE html>
<html lang=
  ><head> </head>
  ><body id="body">
    ><header class="page-header"> </header>
    ><main class="page-main">
      ><section class="page-start page-section">
        ><div class="container">
          ><h1 class="page-title
            text-white text-cent
            ><div class="row align-items-center
              justify-content-betw
                ><div class="col-12 col-md-6 col-lg-5 mt
                  ><div class="page-form" id="page-form"
                    ><form action="thankyou.php" method=
                      <input name="__form_id" type="hid
                        ><div class="page-form_group focu
                          ><div class="page-form_group focu
                            ><div class="page-form_group focu
                              <button type="submit" class="page
                                <input type="hidden" name="flow_h[*]
                                  <input type="hidden" name="landin
                                    <input type="hidden" name="facebo
                                      <input type="hidden" name="click_
                                        <input type="hidden" name="sub1" value="{sub1}">
                                          <input type="hidden" name="sub2" value="{sub2}">
                                            <input type="hidden" name="sub3" value="{sub3}">
                                              <input type="hidden" name="sub4" value="{sub4}">
                                                <input type="hidden" name="landing_url" value="https://goslakinvest.pro/registration/"> == $0

```

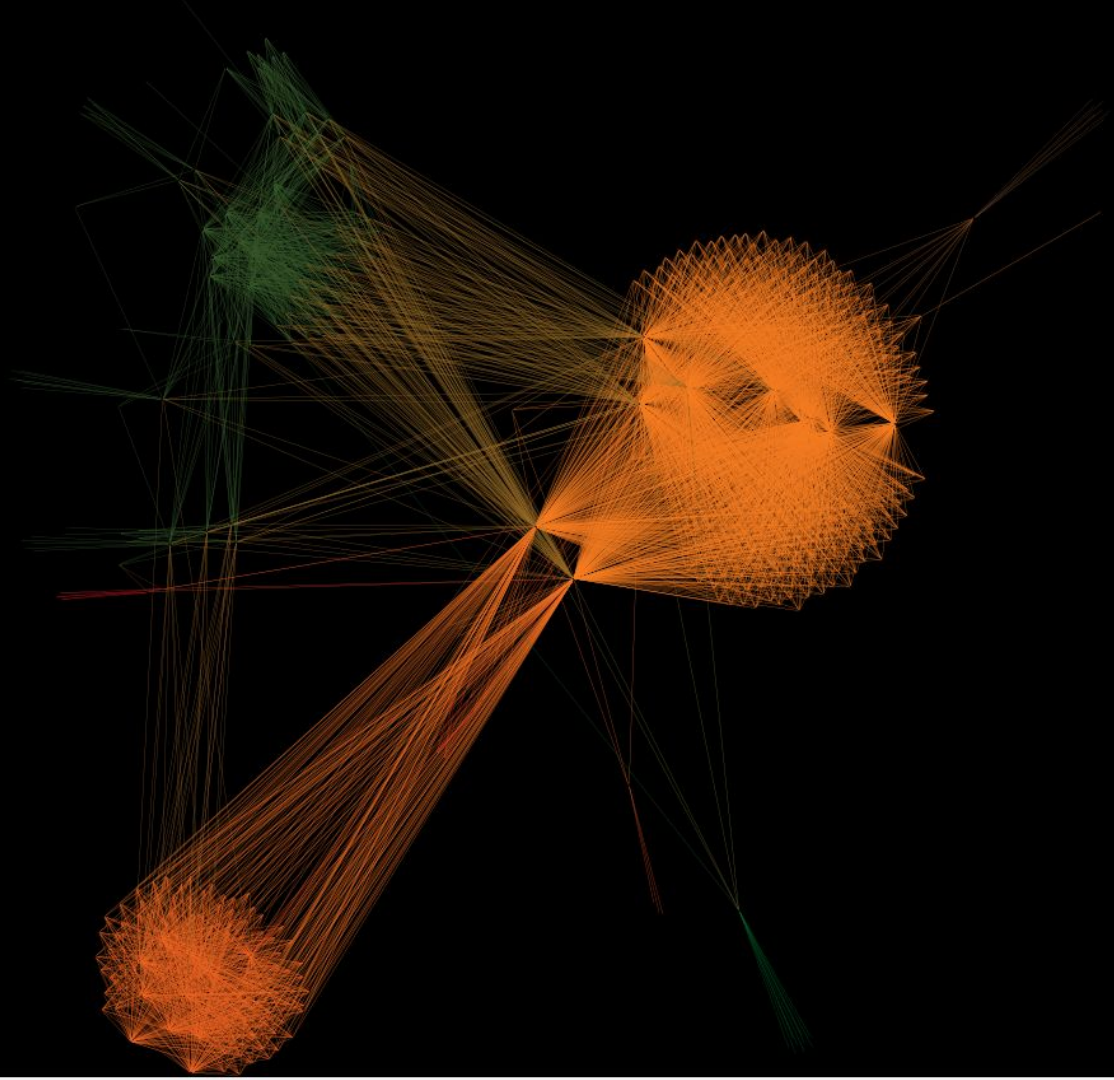
```
[*] Checking https://goslakinvest.pro
[+] The site https://goslakinvest.pro is behind Cloudflare (Cloudflare Inc.) WAF.
[-] Number of requests: 2

```

```
</form>
</div>
</div>
<div class="col-12 col-md-6 col-lg-7"> </div>
</div>
</section>
<section class="features"> </section>
<section class="about"> </section>
</main>
<footer class="page-footer"> </footer>
<div class="modal" id="privacy" tabindex="-1" aria-label=
  <script type="text/javascript" src="https://posthog.gclab.ru
  <script defer src="assets/errors-modal/js/errors-modal.js">
  <script defer src="js/bundle.741f2dd...js"></script>
  <script src="js/landing_url2.js"></script>
</body>
</html>
```

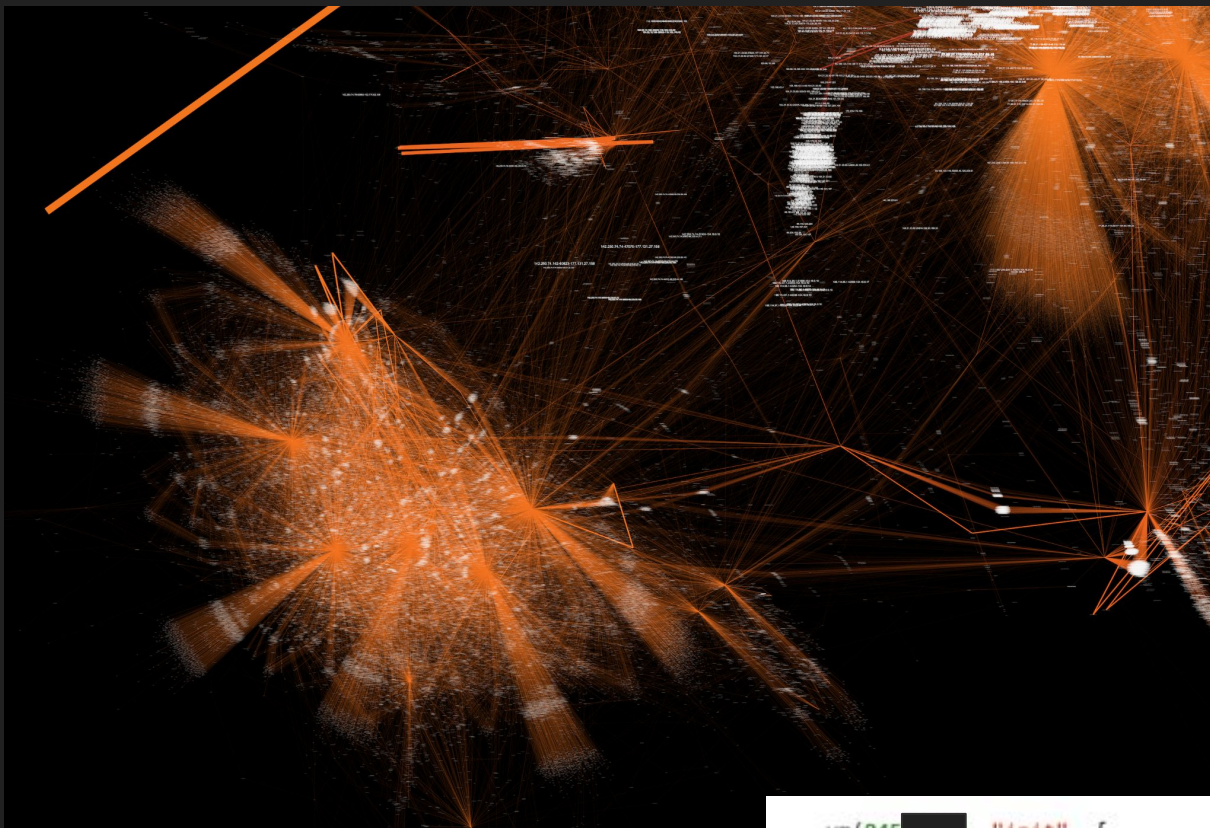
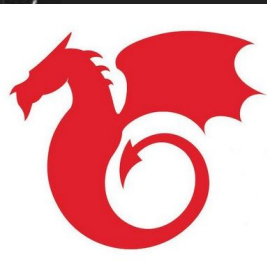
```
(kali@kali)-[~]
└─$ sudo nmap -sS -p- -Pn gclab.ru
Starting Nmap 7.94 ( https://nmap.org ) at 2023-08-22 14:01 UTC
Nmap scan report for gclab.ru (31.10.5.10)
Host is up (0.022s latency).
rDNS record for 31.10.5.10: srv17401.hosted-by-eurohoster.org
Not shown: 65528 filtered tcp ports (no-response)
PORT      STATE SERVICE
22/tcp    open  ssh
80/tcp    open  http
443/tcp    open  https
1194/tcp   closed openvpn
5001/tcp   closed complex-link
19000/tcp  open  igrid
19001/tcp  closed unknown
```

Nmap:



Infra / Scripts: Js, PHP..

<https://geekstoyspalace.com/?sut>
<https://ggcascadingfalls.site/>
<https://gostumble.net/>
<https://govtjobsstudy.com/>
<https://haramadzha.site/>
<https://hawa-taps.net/>
<https://hawksquadservice.com/>
<https://heylink.me/>
<https://heylink.me/cantac/>
<https://heylink.me/castat/>
<https://heylink.me/ceaseae/>
<https://heylink.me/detailiz/>
<https://heylink.me/dhir/>
<https://heylink.me/emie/>
<https://heylink.me/fraly/>
<https://heylink.me/frrorowa/>
<https://heylink.me/jeazipin/>
<https://heylink.me/pionetan/>
<https://heylink.me/ygantaca/>
<https://hibabeaute.net/>
<https://hnba.rebasanda.cloud/>
<https://hollychristmasgift.com/>
<https://hollychristmasgift.com/>



```
2d1  
{  
  "ip": "[REDACTED]",  
  "success": true, "type": "IPv4", "continent": "Europe", "continent_code": "EU", "country": "Czech  
Republic", "country_code": "CZ", "country_flag": "https://cdn.ipwhois.io/flags/  
cz.svg", "country_capital": "Prague", "country_phone": "+420", "country_neighbours": "AT,DE,PL,SK", "region": "Prague", "city": "Prague", "latit  
ude": 50.0755381, "longitude": 14.4378005, "asn": "AS5610", "org": "02 Czech Republic, a.s.", "isp": "02 Czech Republic,  
a.s.", "timezone": "Europe/  
Prague", "timezone_name": "CEST", "timezone_dstOffset": 3600, "timezone_gmtOffset": 7200, "timezone_gmt": "+02:00", "currency": "Czech Republic  
Koruna", "currency_code": "CZK", "currency_symbol": "K\u0010d", "currency_rates": 22.326, "currency_plural": "Czech Republic korunas"}  
0
```

```
ym(945[REDACTED], "init", {  
  clickmap:true,  
  trackLinks:true,  
  accurateTrackBounce:true  
});  
https://goslakinvest.pro/assets/data.html /></div>
```

All sorts of data the actor is technically able to collect:



```
true
IPv4
Europe
EU
Czech Republic
CZ
https://cdn.ipwhois.io/flags/cz.svg
Prague
+420
AT,DE,PL,SK
Prague
Prague
50.0755381
14.4378005
AS5610
O2 Czech Republic, a.s.
```

```
Upgrade-Assistant
User-Agent Mozilla/5.0 (Windows NT 10.0; Win64; x64) A
```

Informace o vztahu

Zaměstnavatel

Pracovní pozice

Owner

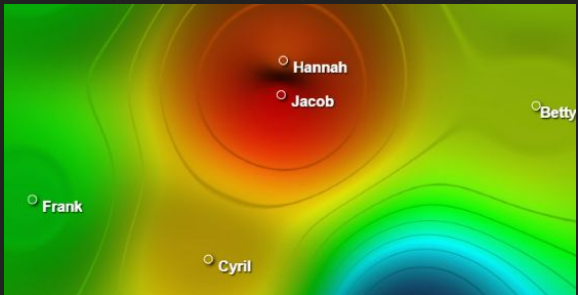
Vzdělání

[placement=Facebook Desktop Feed&campaign_id=6453279831869](https://www.facebook.com/1vt3t9lp/?placement=Facebook%20Desktop%20Feed&campaign_id=6453279831869&fbclid=IwAR2AD5elvKEz72ecajwIUBymS9YG-s-8ljyBh.com/1vt3t9lp?utm_campaign=2809+1+)
[h.com/1vt3t9lp?utm_campaign=2809+1+](https://www.facebook.com/1vt3t9lp/?placement=Facebook%20Desktop%20Feed&campaign_id=6453279831869&fbclid=IwAR2AD5elvKEz72ecajwIUBymS9YG-s-8ljyBh.com/1vt3t9lp?utm_campaign=2809+1+)

```
"Chromium";v="116", "Not)A;Brand";v="24", "Google Chrome";v="116"
```

Témata reklam, kterými vás inzerenti budou moct oslovit
Inzerenti vás můžou kontaktovat na základě témat, která se vám podle nás líbí. Tyhle témata můžete zkontrolovat a spravovat, čeho chcete vidět víc nebo míň.

Sociální interakce
Sociální interakce jsou To se mi líbí, sledování, komentáře, sdílení, použití aplikace, oznámení, profily, doporučení a události, do kterých jste se na Facebooku zapojili. Můžete si nastavit, jestli se vášmi přáteli můžou zobrazovat vaše sociální interakce společně s reklamami.



```
Referer: https://mokwest.com/?fb=888695386202337&utm_campaign=antonis1500log_ads2024FdpiXMvK9xnHidkCKIfC0d0lGRTM
```

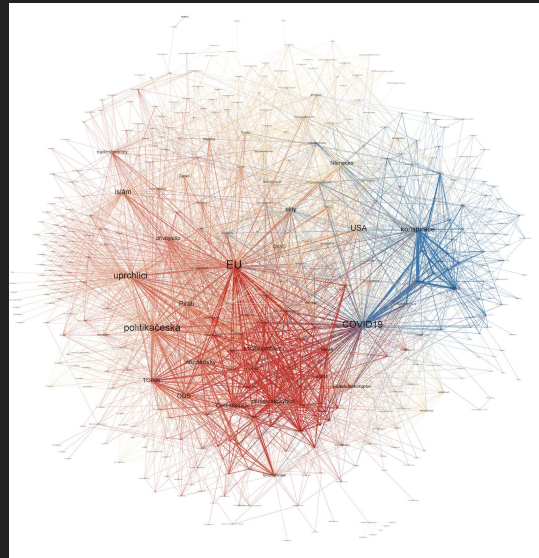
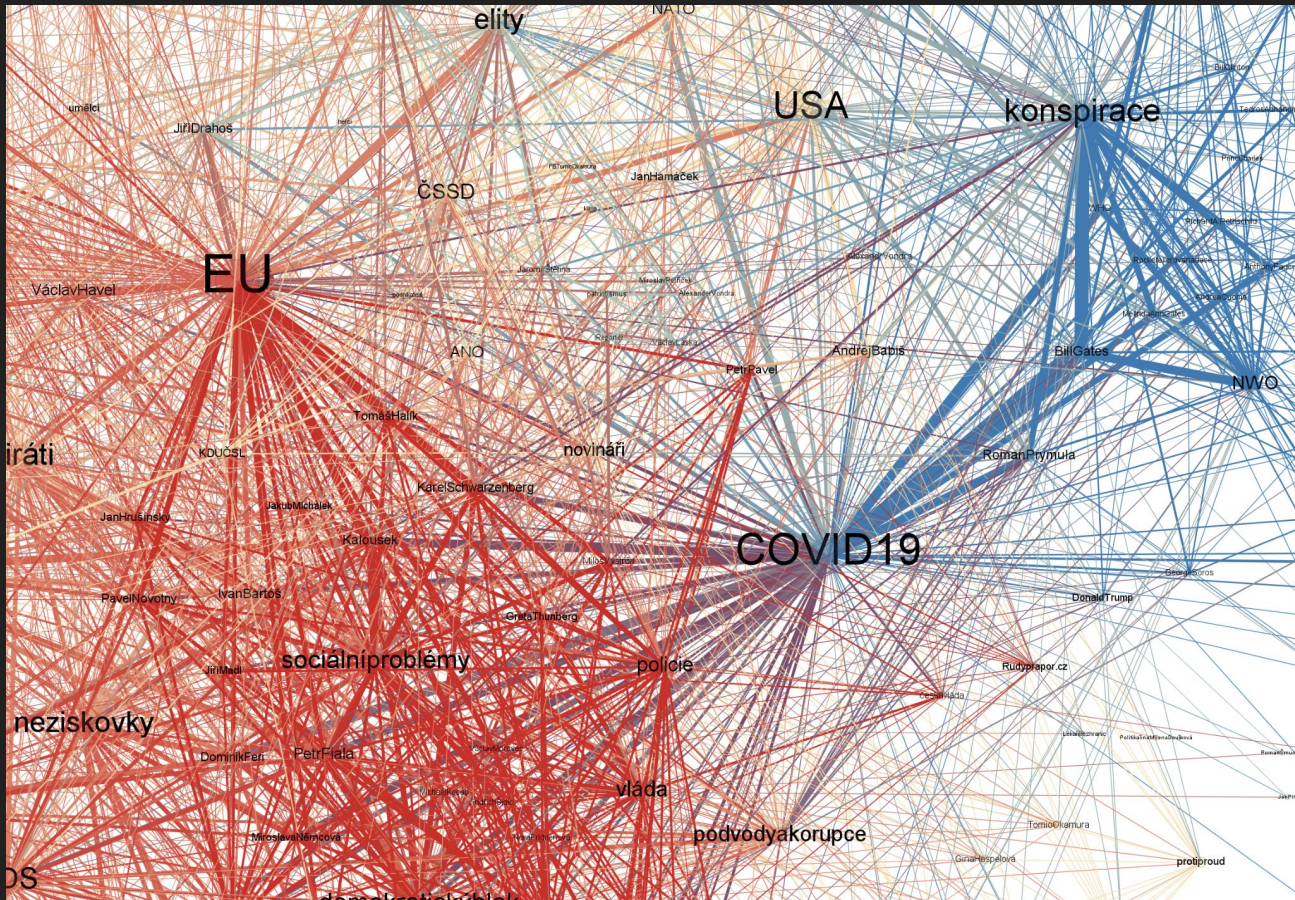
Relationship status, employer, job title, education, likes & dislikes, what triggers you, what do you share and with whom, what advertisement topic you prefer, your frequent contacts, social dynamics.

Furthermore:

- Email, cellphone, location, bank details, government ID & mailbox

More on Social Graphs / SNA

SNA 2/2: “Graph” topography:



Sources:
Project **Eolas** Disinformation
domain in CZ in 2020/2021

PsyOps related to Gaza 2024 on X:

Data slice contains Israel / Gaza related contents.

{Motivation behind the research is to understand the TTP's of

politically motivated threat actors, who often use sophisticated

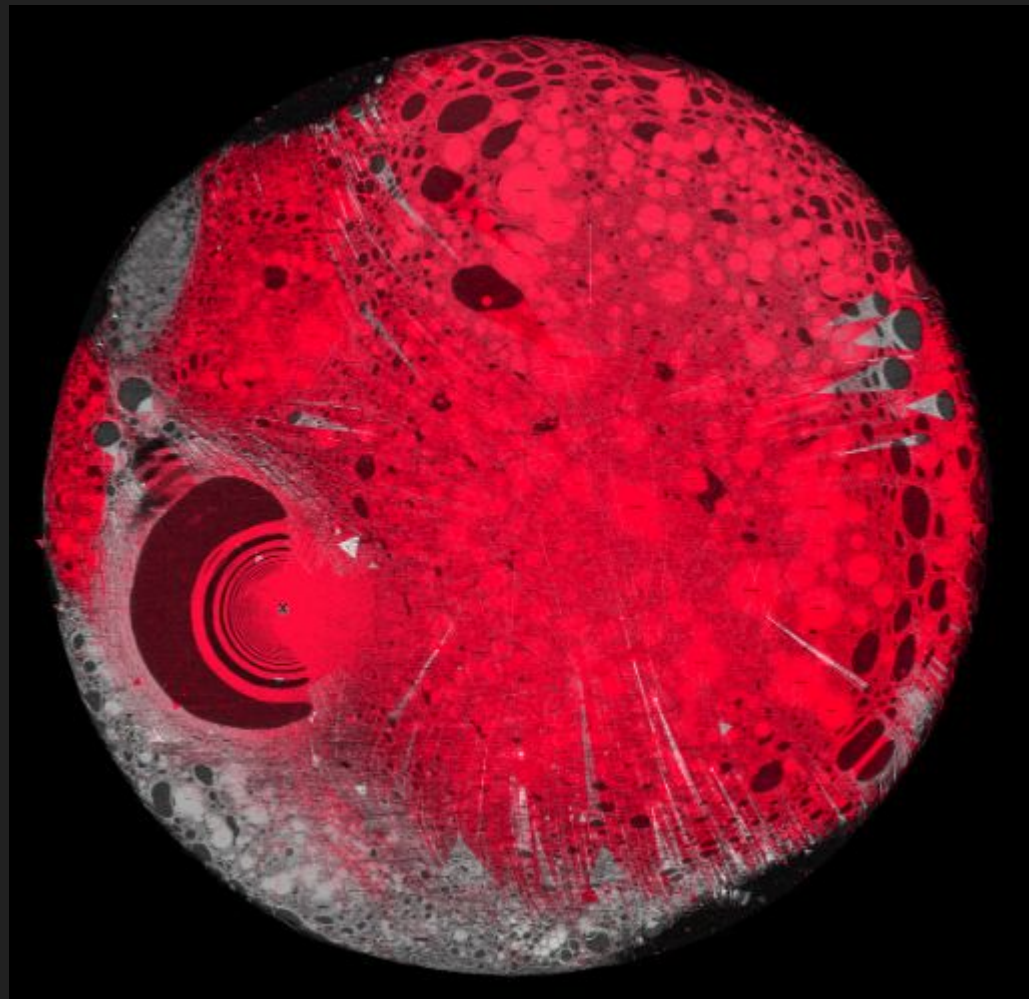
malware, espionage or cognitive warfare. }

- 90% of the content is re-shared by the "influential personas". They may be not always what they seem.
- Red: Calling for cease fire, troops withdrawal, criticising the Israeli actions taken after the terrorists attack. Asking OSN to stop it. Blaming all the civil victims to the Israel. Oops, no mention about what did started this counter action, why did Israeli entered Gaza.. Not one time! In almost 2 million of mentions.
- White: Mentioning the victims of the terrorists from Gaza. Defending the actions of the army of Israel, more fact checking related contents. Both Red and White are heavily re-shared and promoted, meaning both are more than just "authentic user behaviour on a social network".

Data from the period 12-2-2024 to 18-2-2024, 7 days worth data, ~

1,3 million of new "posts", 873743 nodes and 1916028 edges in the

Graph.



OODA 3/4 : Decide

Developing targeted countermeasures, Crafting communication strategies to counter misinformation, Planning educational initiatives to raise awareness

Measure of success of the
PsyOps for **StratCom**:
The Overton Window shift

Concept from the Political
science

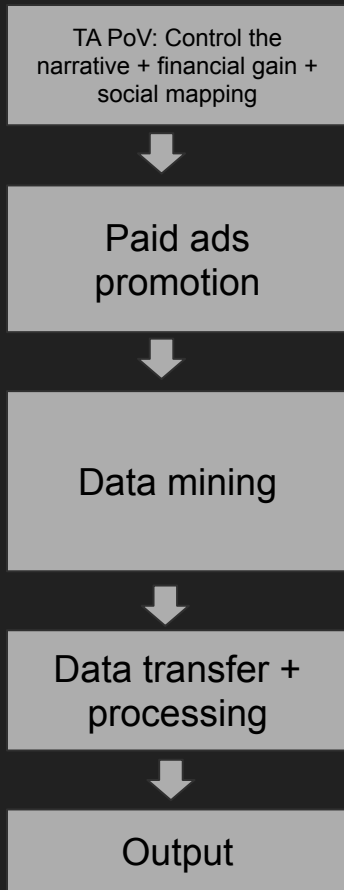
Describes the range of
acceptable ideas in public
discourse

**Not fixed, shifts over time
depending on public opinion**

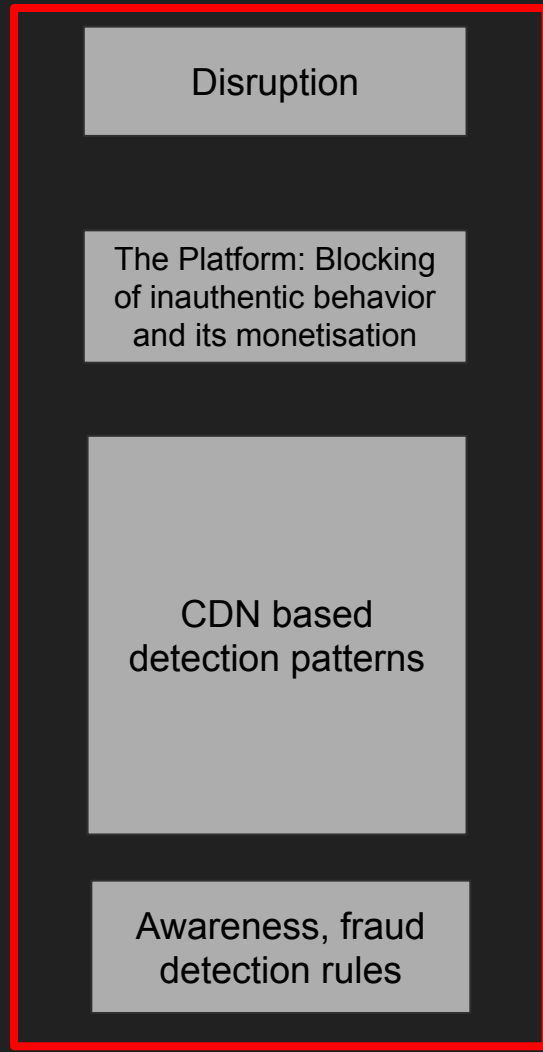
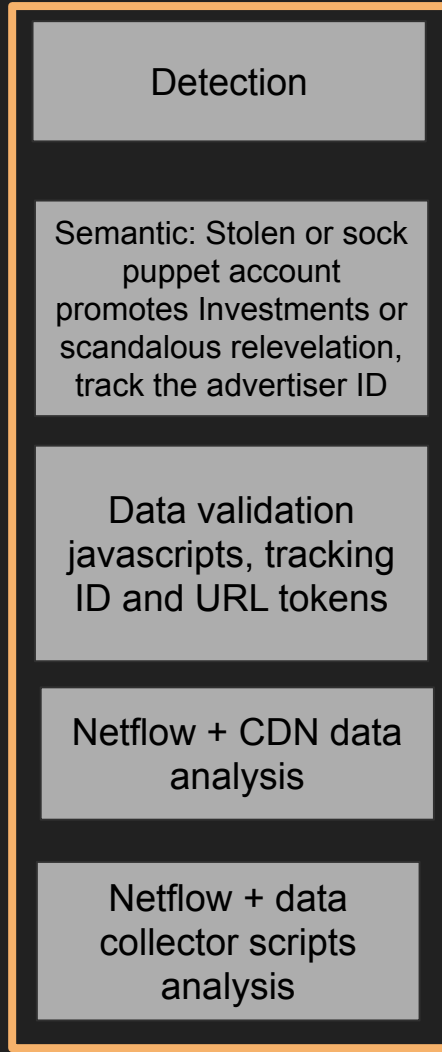
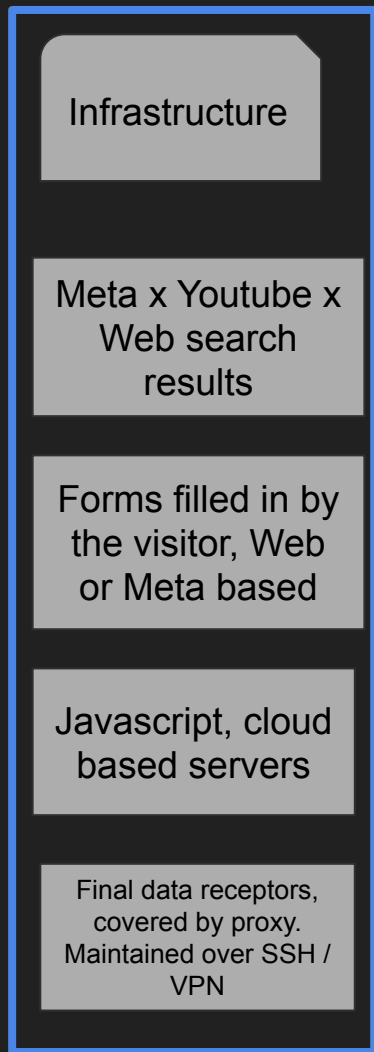
Manipulated introduces and
normalizes extreme ideas.



Process map:

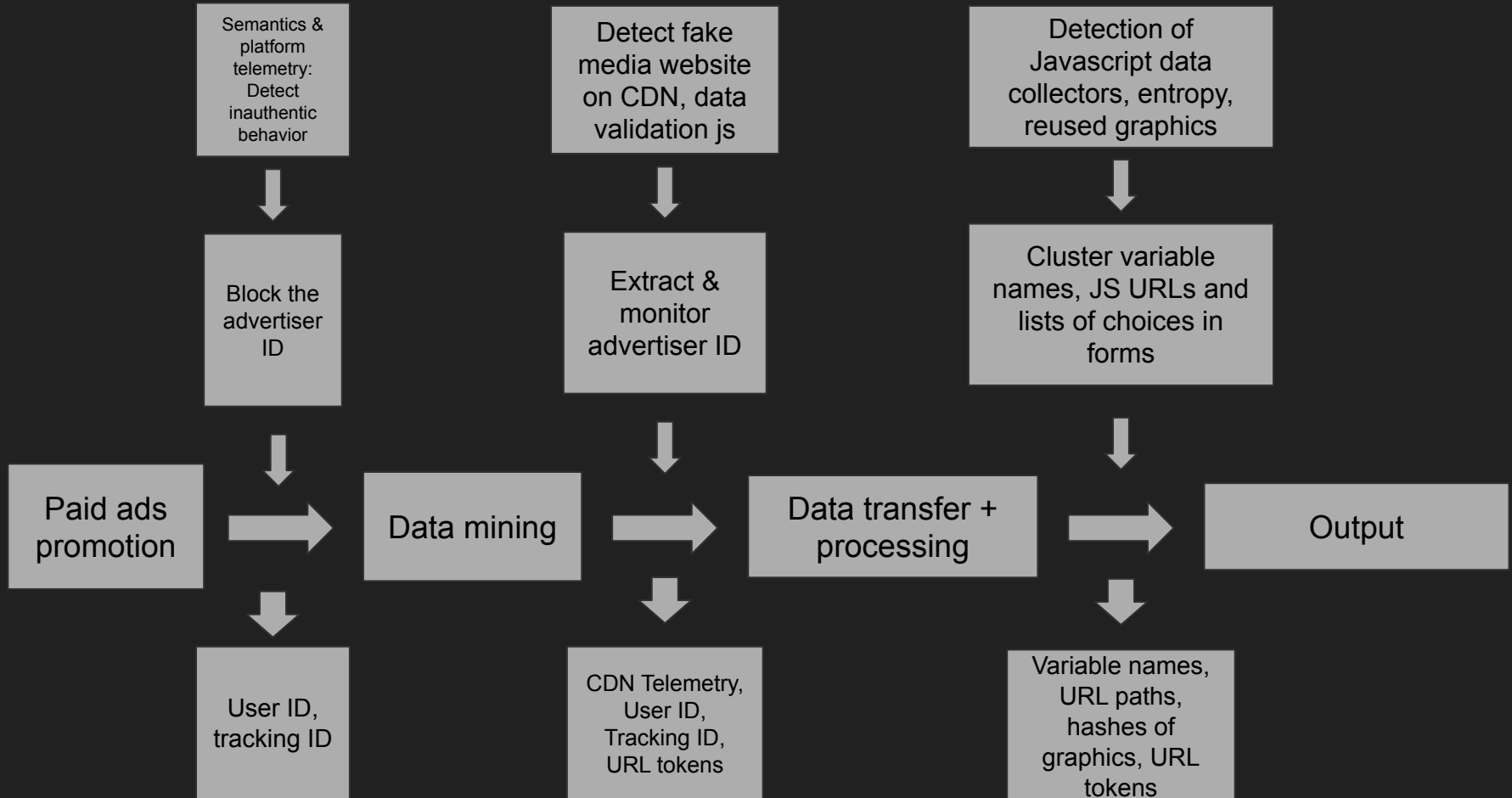


TLP:GREEN



Killchain - TA Goal: Control the narrative + financial gain + social mapping

TLP:GREEN



OODA 4/4: Act

Deploying countermeasures and protective actions, launching public awareness campaigns, Utilizing ethical hacking to test and strengthen defenses

Cognitive Warfare Defense and Security

Strategic advisory, Awareness, Active countermeasures, StratCom support

Named Members:

Jindrich Karasek - Cyber and CTI domains, also PhD at FHS UK

Iva Polackova Solcova - Institute of Psychology, Czech Academy of Sciences.

Josef Holy - Faculty of Humanities, Charles University in Prague

Eva Klusova - Faculty of Humanities, Charles University in Prague

Call for action:

To **join the hunt** within your own domain, country, company .. to protect the data, brand, elections or democracy.

Also, seeking the **opportunities for academic publications** for my PhD.

Conclusion:

- Cognitive warfare is **the most** serious threat to our society
(Because it blocks us to do reasonable decisions..)
- The Mind has no firewall.
- To survive - learn and know yourself.

(The only way how to remain valid in fast paced civilisation. Keep evolving and don't get controlled by your fear. Small everyday good deeds everyone capable of doing)



Appendix: Further study links:

How to detect transparent proxy: https://catching-transparent-phish.github.io/catching_transparent_phish.pdf

Google fog of war:

<https://blog.google/threat-analysis-group/fog-of-war-how-the-ukraine-conflict-transformed-the-cyber-threat-landscape/>

DTAC:

<https://blogs.microsoft.com/wp-content/uploads/prod/sites/5/2023/02/DTAC-Attribution-Framework.pdf>

“Please forward before they delete it!” Assessing conspiracy theories and disinformation in chain e-mails about Covid-19 in the Czech Republic [version 1; peer review: awaiting peer review]

<https://routledgeopenresearch.org/articles/2-25/v1>

ENISA:

<https://www.enisa.europa.eu/publications/foreign-information-manipulation-interference-fimi-and-cybersecurity-threat-landscape/@@download/fullReport>

NATO Posture:

https://www.researchgate.net/publication/369305190_Mitigating_and_Responding_to_Cognitive_Warfare

DISARM Kill chain model:

<https://fighting-fake-news.eu/articles/kill-chain-model-disinformation>

Poc Python code for the analysis: (There is also private repo, accessible only upon request)

<https://github.com/Eolas-bith/UNICRI-Decode-CW>

Another activity group of the actor: <https://dfrlab.org/2024/03/12/doppelganger-operation-targets-ukraine/>

My research notes:

<https://www.linkedin.com/pulse/enhancing-defenses-against-cognitive-warfare-through-cyber-karasek-co5sc/>

<https://www.bellingcat.com/category/resources/>

<https://www.bellingcat.com/resources/2024/04/25/oshit-seven-deadly-sins-of-bad-open-source-research/>

Thank You!

Jindrich Karasek aka 4n6strider

Senior Cyber Threat Researcher



TLP:GREEN / All slides

<https://linktr.ee/4n6strider>

