

Emerging Digital Services in Cyber Environments

Moderator

Nitin Agarwal, University of Arkansas at Little Rock, USA

Panelists

Valentin Plenk, Institute of Information Systems at Hof University, Germany

Eugen Borcoci, University POLITEHNICA Bucharest, Romania

Maryam Rezaeian, University of Gloucestershire, UK

Nitin Agarwal, University of Arkansas at Little Rock, USA

Valentin Plenk, Institute of Information Systems at Hof University, Germany

- **Bio:** Prof. Dr.-Ing. Valentin Plenk received diploma in electrical engineering from Technical University of Munich. In 1996 he passed his doctorate in the department of mechanical engineering of the Technical University of Munich in the field of surface roughness measurements. Since October 2000 Valentin Plenk teaches control engineering as a full professor at Hof University. After various small research projects he was elected dean of the department of engineering and managed the department from 2003 to 2007 and 2009 to 2015. In his second term he headed the reorganization process that integrated the former textile department into the department of engineering. Since January 2016 he leads the research team for Cyber-Physical Systems at Hof University's Institute of Information Systems (iisys). Since January 2016 he is the scientific head of the Institute of Information Systems (iisys).
- **Title:** Stories from Digital Mobility Systems / User Assistance Systems / Citizen Science

Eugen Borcoci, University POLITEHNICA Bucharest, Romania

- **Bio:** He is a professor at University „Politehnica” of Bucharest (UPB), Electronics, Telecommunications and Information Technology Faculty. His expertise, teaching activities and research have been oriented to specific domains of telecommunications and computer networks architectures, protocols, technologies and services. His current research interest is on new technologies like Software Defined Networking (SDN), Network function virtualization (NFV), Fog/edge computing, 4G/5G slicing, vehicular communications. He has published 5 books, 4 textbooks and over 170 scientific or technical papers and scientific reports. He has been UPB team leader in many European research projects.
- **Title:** New services and use-case perspectives in the context of the 5G technology".

Maryam Rezaeian, University of Gloucestershire, UK

- **Bio:** She is a committed IT specialist and researcher with experience at researching and teaching in UK academic institutions. Her qualifications include a PhD in Computing with IT Management and a MA in Computing with IT Management from the University of Gloucestershire. Her PhD focuses on Enterprise Resource Planning (ERP) using implementation models at small and medium enterprises (SMEs). The research reviewed existing implementation methods and main dimension of change (people, process, technology) to propose a new implementation model for SMEs to ERP vendors.

Her primary research interest is in the area of Management and Information Systems implementation and development in small and medium sized businesses in the developing world. Her research has always been the use of information systems to manage and support business operations. Her future research is to build on the foundation of her PhD and to investigate information management, computing for business, big data analytics, information systems implementation, particularly in developing worlds to support business operation in Manufacturing SMEs. She also uses theoretical analysis that allows exploration of design parameters across wider ranges and in isolation, and helps to understand the impact of each parameter on the observed behaviour of the system.

- **Title:** Cyber security and computer viruses: implications for the IT Service Desk

Nitin Agarwal

- **Bio:** He is the Jerry L. Maulden-Entergy Endowed Chair and Distinguished Professor of Information Science at the University of Arkansas at Little Rock and the Director of the Collaboratorium for Social Media and Online Behavioral Studies (COSMOS). He researches cyber information campaigns, social computing, deviant behavior modeling, group dynamics, social-cyber forensics, data mining, and privacy. He has published 8 books and over 150 articles in top-tier peer-reviewed forums with several best paper awards and nominations. His research is supported by grants from the National Science Foundation (NSF), Office of Naval Research (ONR), Army Research Office (ARO), Defense Advanced Research Projects Agency (DARPA), Air Force Research Laboratory (AFRL), Department of State (DOS), North Atlantic Treaty Organization (NATO), and a priority partnership with the Department of Homeland Security's (DHS) Center of Excellence for Criminal Investigations and Network Analysis (CINA). He is IARIA fellow. Visit <http://ualr.edu/nxagarwal/> for more details.
- **Title:** Disinformation in Cyber Environments

Panel Outcomes

- Digital services have led to several innovative applications (Uber, Air BNB, etc.) that are of commercial impact, support citizen participation, and contribute to social good.
- However, security and privacy concerns persist
- To address these concerns, panel concurred there is a need for better education and awareness, stringent policies or regulations, and accountability.



Softnet 2018

**Panel on Emerging Digital Services
in Cyber Environments**

**Theme: New services and use-case
perspectives in the context of the 5G
technology**

Eugen Borcoci

University Politehnica Bucharest

**Electronics, Telecommunications and Information Technology Faculty
(ETTI)**

Eugen.Borcoci@elcom.pub.ro



New services and use-case perspectives in the context of the 5G technology



- The 5G (fifth generation) networks, in E2E architectures
 - **Driving forces for 5G** - need of enhanced and new services for IoT, smart cities, industry, governance, IoV/automotive, safety/emergency, entertainment, environment, etc.
 - **5G- technology – aiming to**
 - provide a **large set of services** for different categories of **tenants/users**
 - offer flexibility, high capacity/bandwidth, low response time, admit large number of terminals, energy saving, etc.
 - **5G- high interest** from : user communities, operators/ providers/ manufacturers, academia, and standardization/fora organizations
 - 3GPP, 5GPP, ETSI, ITU-T, GSMA, ONF, NGNM, IETF, IEEE, etc.



New services and use-case perspectives in the context of the 5G technology



- Three views/sets-of-requirements for 5G
 - *user-centric* (uninterrupted connectivity and communication services, smooth consumer experience in various contexts)
 - *service-provider-centric* (connected intelligent systems, multi-tenant, multi-domain capabilities, large area of IoT services, critical monitoring/tracking services)
 - *network-operator-centric* (scalable, energy-efficient, low-cost, efficiently managed, programmable, and secure - communication infrastructure)



New services and use-case perspectives in the context of the 5G technology



- **Network slicing** – important 5G concept : resource sharing (with **logical isolation**) among **multiple tenants/users** or **network operators** in a **multi-domain context**
 - **Each slice can be customised for a given set of services with flexible set of QoS/QoE guarantees for users**
 - **On demand, concurrent deployment of multiple E2E logical, self-contained and independent shared or partitioned networks** on a common infrastructure platform
 - **E2E concept** : covers all network segments : radio, wire access, core, transport and edge networks.



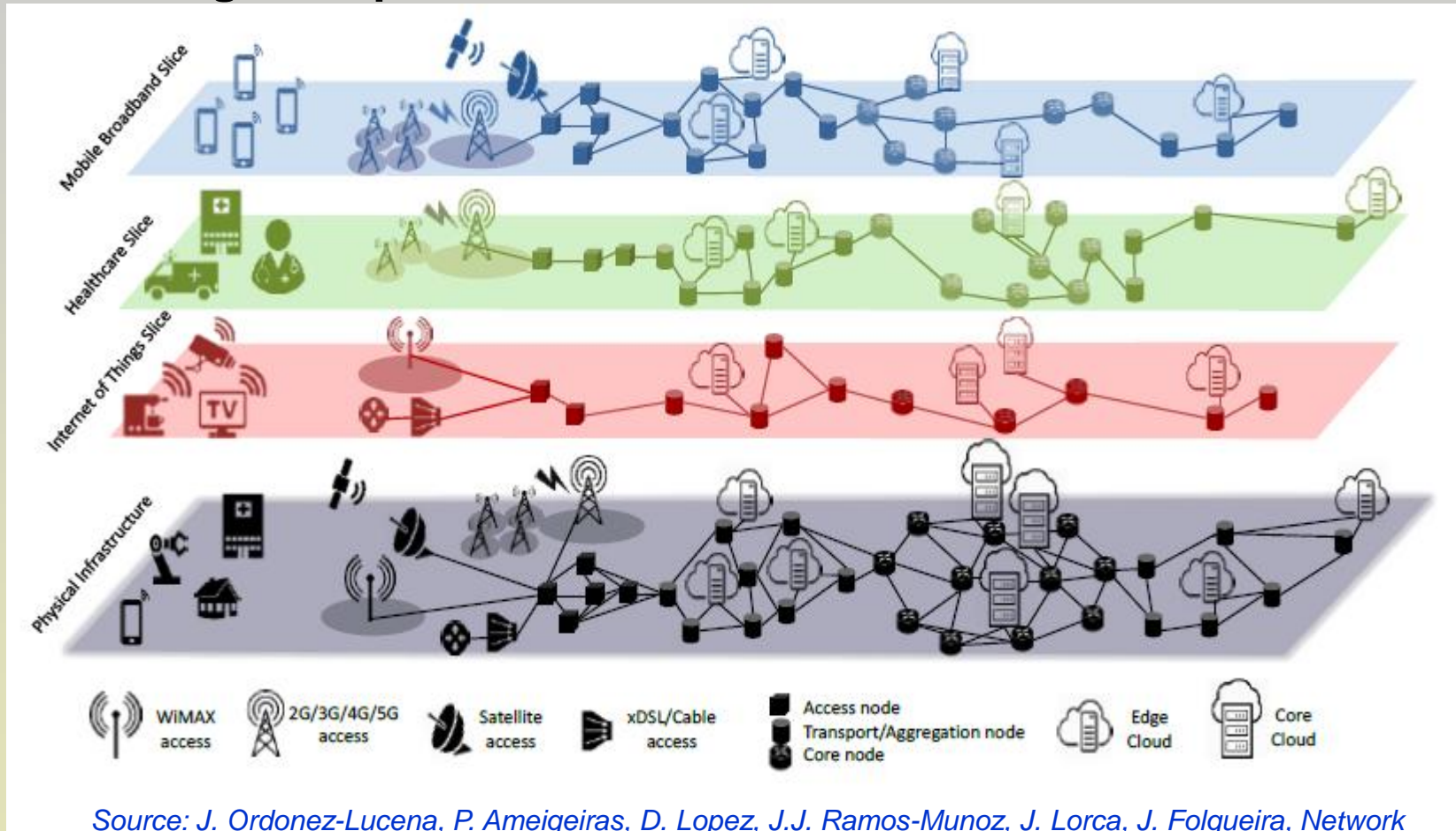
New services and use-case perspectives in the context of the 5G technology



- **Network slicing – in cyber environments**
- **Isolation** - requirement for **parallel slices** running on a shared underlying substrate
- **Isolation aspects:**
 - **Performance:**
 - each slice is defined to meet particular service reqs. (KPIs)
 - service-specific performance reqs. **should be always met on each slice**, regardless of the congestion and performance levels of other slices.
 - **Security and privacy:**
 - **Attacks/faults** in one slice **must not have an impact on other slices**
 - **mgmt issues:** each slice must have independent security functions
 - to prevent unauthorized entities to have r/w access to slice-specific configuration/management/accounting information
 - to record any of access attempts, whether authorized or not

New services and use-case perspectives in the context of the 5G technology

- **5G slicing example-** different slices are dedicated to a set of services



Source: J. Ordonez-Lucena, P. Ameigeiras, D. Lopez, J.J. Ramos-Munoz, J. Lorca, J. Folgueira, Network "Slicing for 5G with SDN/NFV: Concepts, Architectures and Challenges", IEEE Communications Magazine, 2017, Citation information: DOI 10.1109/MCOM.2017.1600935

New services and use-case perspectives in the context of the 5G technology

Categories of 5G fundamental scenarios

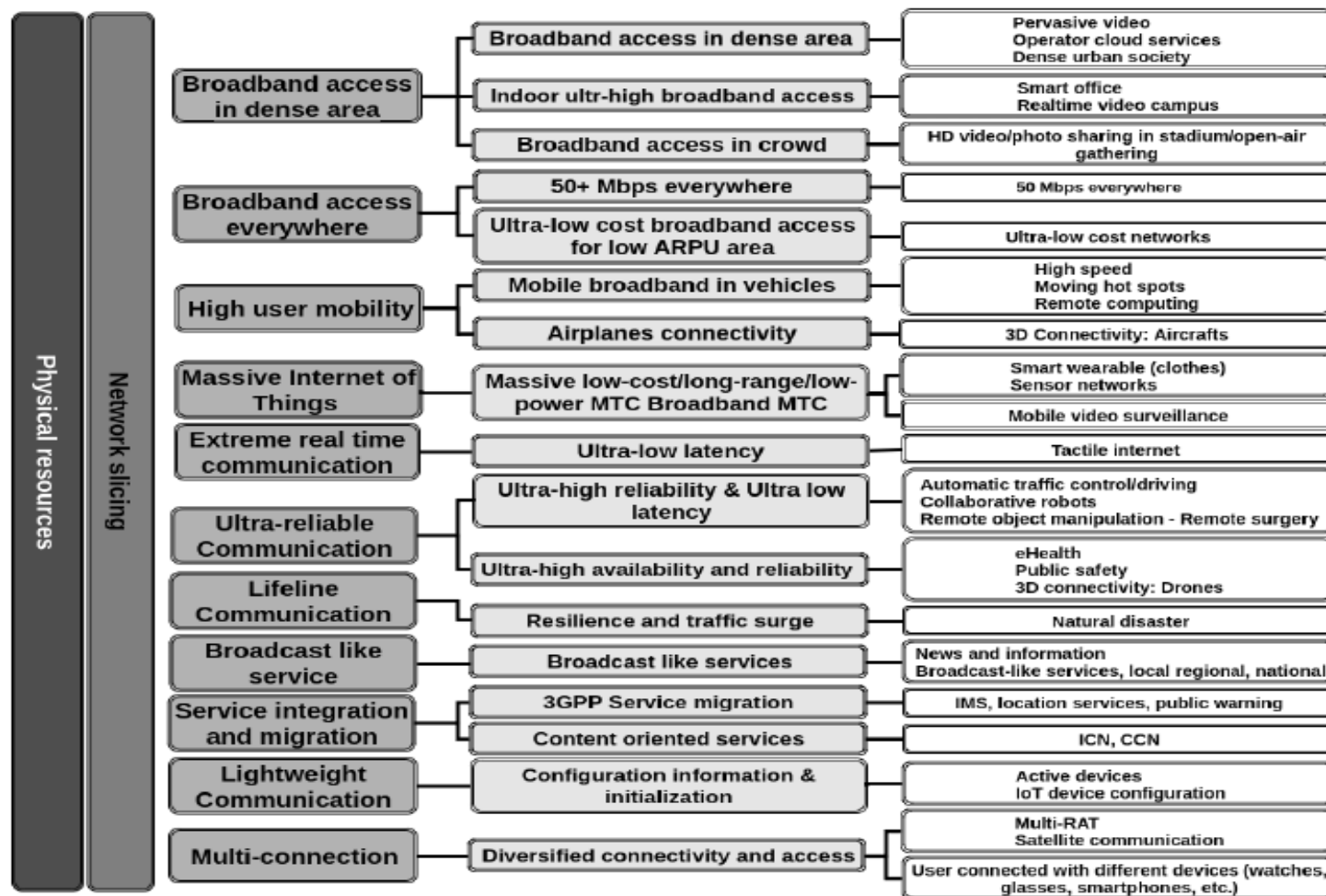
- Massive machine type communication (mMTC)
- Ultra reliability low latency communication (URLLC)
- Enhanced mobile broadband (eMBB)
- **different requirements on 5G: functional** (e.g. priority, charging, policies, security, and mobility) and **performance** (e.g. latency, mobility, availability, reliability and data rates) -→ **dedicated slices can be constructed**

Characteristics	mMTC	URLLC	eMBB
Availability	Regular	Very High	Regular (baseline)
E2E latency	Not highly sensitive	Extremely sensitive	Not highly sensitive
Throughput type	Low	Low/med/high	Medium
Frequency of Xfers	Low	High	High
Density	High	Medium	High
Network coverage	Full	Localized	Full

Source: End to End Network Slicing – White paper 3 Outlook 21, Wireless World, Nov 2017

New services and use-case perspectives in the context of the 5G technology

Use-cases family and category per 3GPP and NGMN



Source: *MGMN 5G WHITE PAPER, NGMN Alliance, white paper, https://www.ngmn.org/uploads/media/NGMN_5G_White_Paper_V1_0.pdf, Feb. 2015.*



New services and use-case perspectives in the context of the 5G technology

- **Verticals and Use cases**
- **Augmented Reality (AR)/ Virtual Reality (VR)**
 - Strong-Interactive VR: Audio-visual interaction
 - Strong-Interactive VR: Low-delay speech and video coding
 - Strong-Interactive AR: Use Cases
- **Automotive (CV2X)**
 - Infotainment
 - Telematics
 - Road Safety and Efficiency:
 - road warning, information sharing
 - Advanced Driving Service
 - Cooperative driving
 - Platooning
 - Tele-operation
- **Energy**
 - Smart-grids, Micro-grids
 - Smart meters and aggregator gateways
 - Electricity traffic scheduling



New services and use-case perspectives in the context of the 5G technology



- **Verticals and Use cases (cont'd)**
- **Healthcare**
 - Hospitals, Rehabs and care homes
 - Health and wellness monitoring
 - Remote healthcare, Remote surgery
- **Industry 4.0, Manufacturing**
 - Augmented reality, Control-to-control (C2C)
 - Motion control, Mobile robots and mobile platforms
 - Mobile Control Panels with Safety Functions, Closed-loop control
 - Process monitoring, Plant asset management
- **Internet of Things for Low Power Wide Area Applications**
 - Asset Tracking and monitoring, Waste management, Smart parking, Smart manhole, Water metering, Gas Metering
- **Public Safety**
 - Mission critical : Push-To-Talk, data, video, IoT
- **Smart Cities**
 - Intelligent lighting
 - Public safety
 - Emergency service management



New services and use-case perspectives in the context of the 5G technology



■ Conclusions

- 5G and slicing technology offer a large range of digital services in multi-tenant, multi-domain and E2E context
- Still many R&D open issues related to
 - business models, architecture, services creation and management, network management and control, security, virtualisation techniques, implementation and deployment, etc.
- Estimations exist - that commercial 5G-based networks will be available after 2020....
- Thank you !



Cyber security and computer viruses: implications for the IT Service Desk

Martin Wynn and Maryam Rezaeian
University of Gloucestershire

Information security in IT services

- ▶ Information Security is a critical part of how we run the Infrastructure
- ▶ No industry segment is immune to cyber-attacks and the public sector tops the list for targeted security incidents (Benson, 2017). Institutions should consider important structural and resource-related issues before establishing such a competition.
- ▶ Critical infrastructures increasingly rely on information systems and on the Internet to provide connectivity between systems. Maintaining and protecting these systems requires an education in information warfare that doesn't merely theorize and describe such concepts
- ▶ Most organizations' IT help desk serves as a clearinghouse of information about internal and external activities, as well as usage of technology. As such, it can be a logical first line of defence against hackers and other criminals.



Issues/dangers

- ▶ User Account Policy (there are staff accounts that are still alive)
- ▶ Privileged Access (Admin rights)
- ▶ Managing the security Configuration (such as password, unnecessary software)
- ▶ Security update (windows update on users machine)
- ▶ System Administrators
- ▶ Mobile devices and iPad and users devices

Potential solutions/Challenges

- ▶ Secure the internet connection (use the firewall to secure the internet connection)
- ▶ Secure University's devices and software (choose the most secure settings for your devices and software)
- ▶ Control access to the university data and services (control who has access to our data and services)
- ▶ Protect from viruses and other malware (protect ourselves from Viruses and other malware)
- ▶ Keep the university devices and software up to date

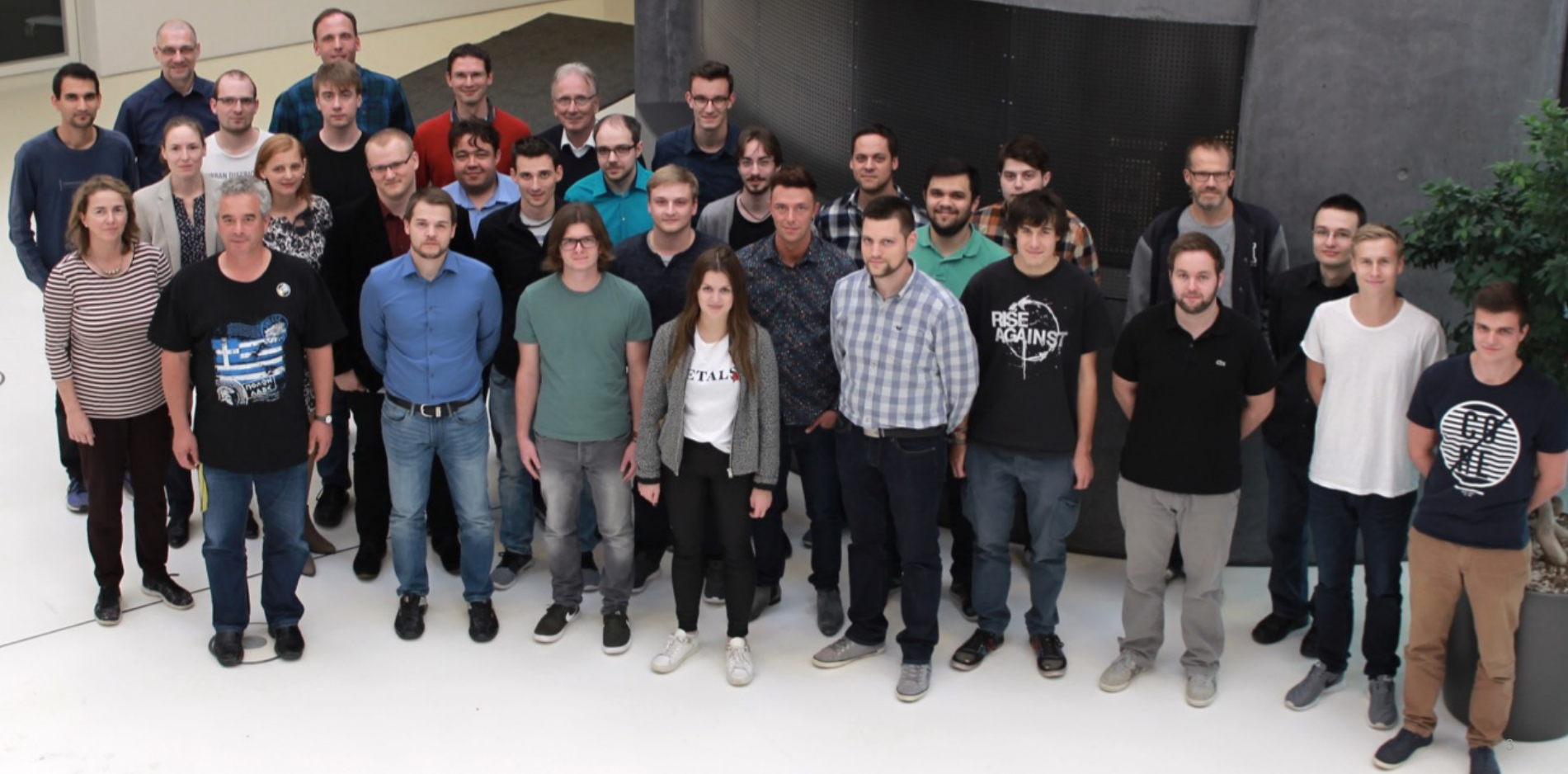
The Institute of Information Science at Hof University

Digital Mobility Systems / User Assistance Systems / Citizen Science



valentin.plenk@iisys.de

The Team

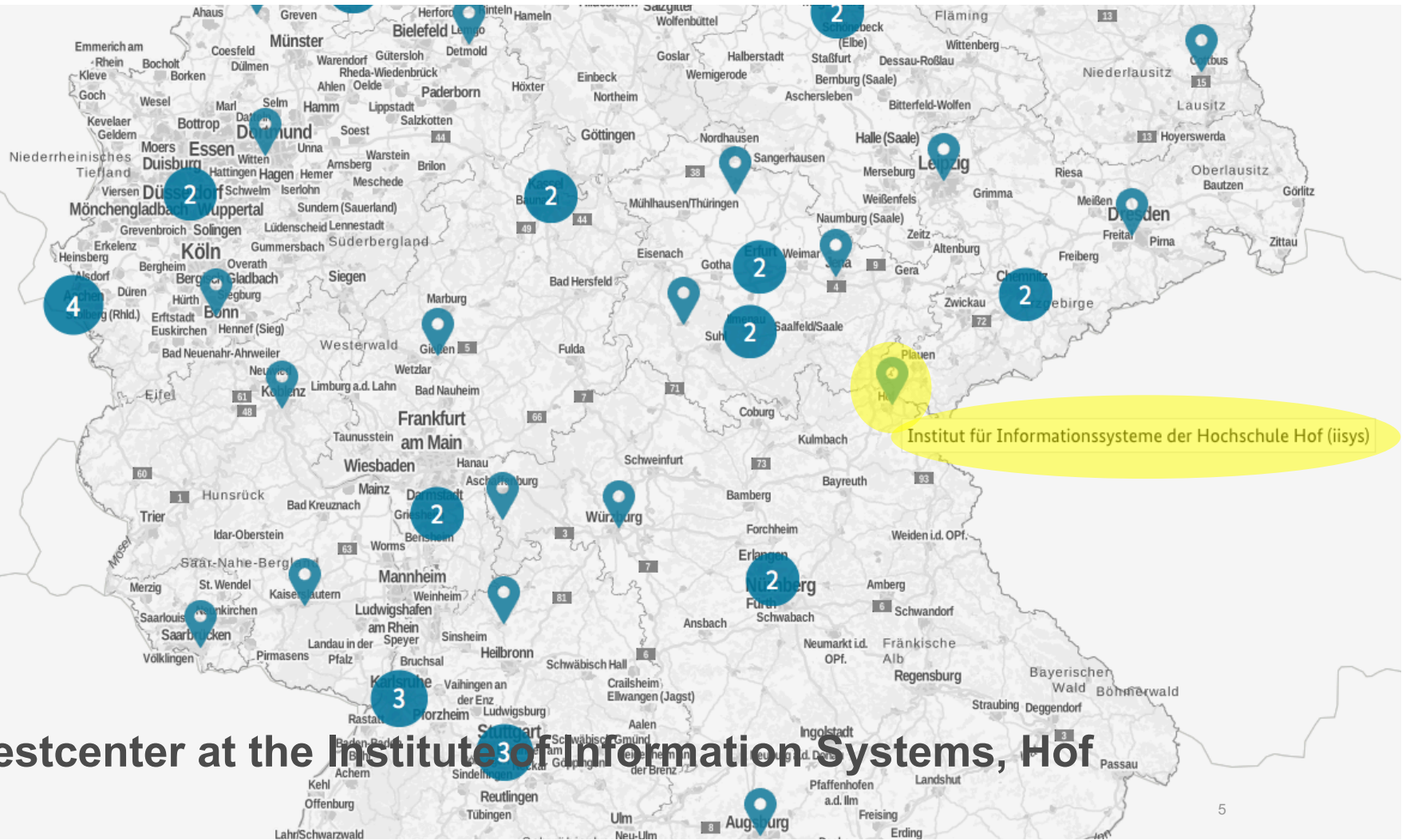


Landkarte Industrie 4.0

Anwendungsbeispiele

Testzentren

Informations- und Unterstützungsangebote



Industry 4.0 Testcenter at the Institute of Information Systems, Hof

Analog to Digital – Production Log

Aufschreibung des Mitarbeiters der Ist-Daten für Maße und Funktion des Artikels aus der P

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Auftrag: 978920
Anlage: T M 007.1
Menge: 0 / 480
? 2901

Steuerung

Schicht
1 2 3 4 5 6 8

Uhrzeit **17:05**

Dauer **05:31:13**

Letzter Vorgangstart
11:34 Uhr

Aufrüsten

Anfahren

Extrusion

Variantenwechsel

Abrüstung

Auftrag beenden

Werte

Zur Verpackungsvorschrift

Startzeit und Startdatum
09:57 07.07.2018

Endzeit und Enddatum
17:05 10.07.2018

Gutware und Ausschuss
Gutware Ausschuss

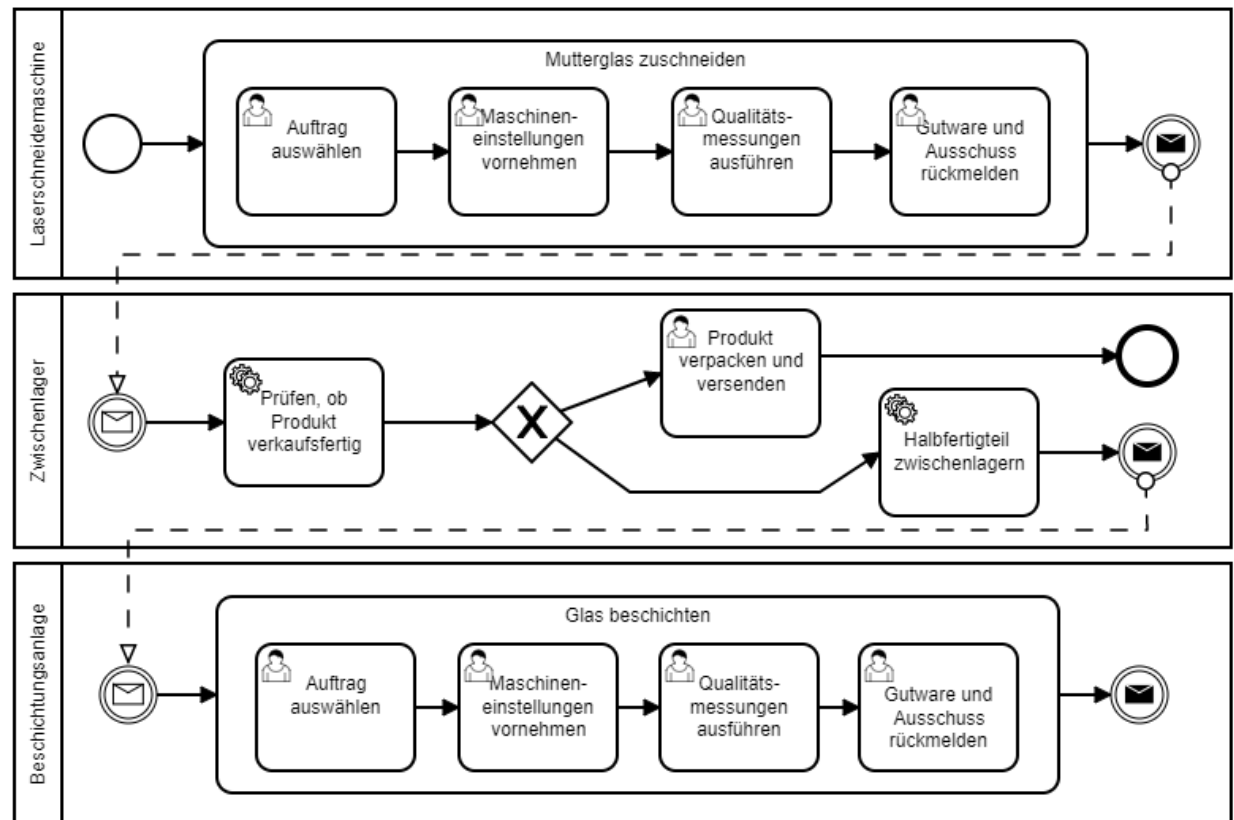
kg/m und Geschwindigkeit
kg/m v m/min

Vorgang	Startzeit hh:mm	Endzeit hh:mm	Menge (m)			Gewicht (kg/m)	v (m/min)
			Gutware	Gesamt	Ausschuss		
Aufrüsten	06.07.2018 14:43	07.07.2018 09:57	0	0	0	0	0

Analog to Digital – Workflow

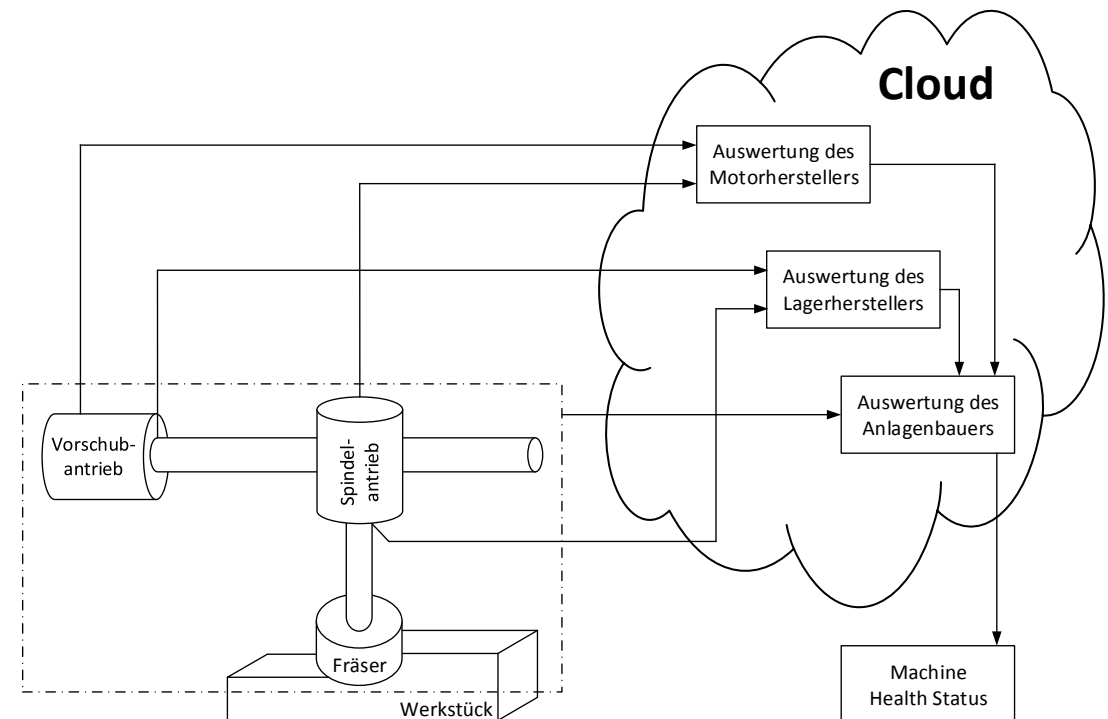
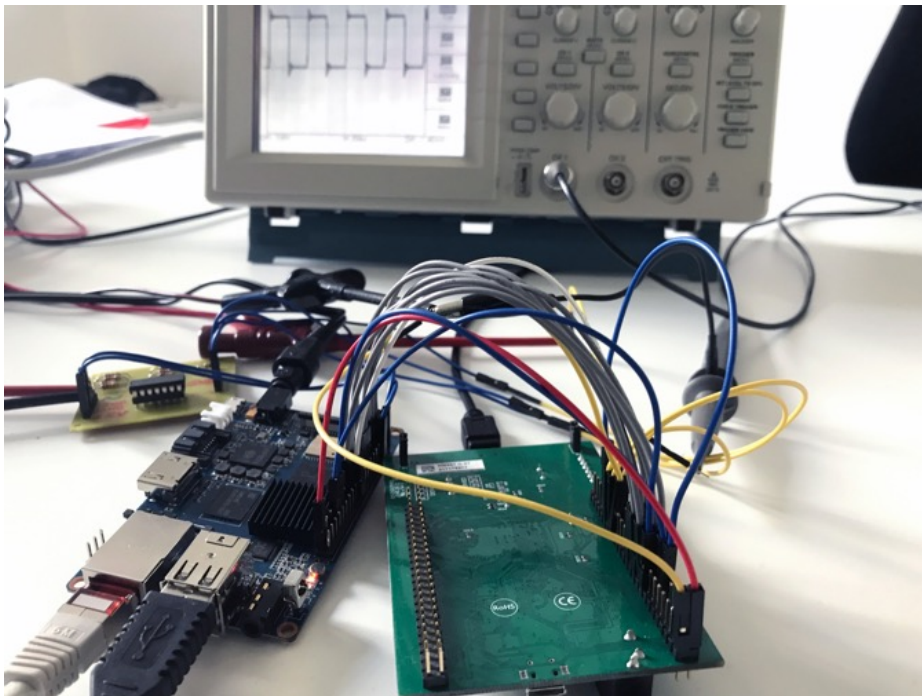


Bildquelle: eigenes Foto



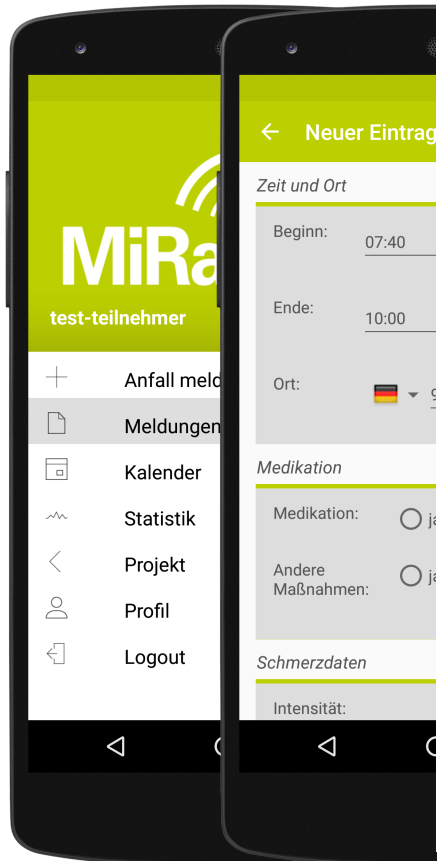
Bildquelle: eigener Screenshot mit Camunda Modeler erstelltes Diagramm

Analog to Digital – Condition Monitoring



V. Plenk and F. Ficker. Industrie 4.0. In D. Wolff and R. Göbel, editors, Digitalisierung: Segen oder Fluch, chapter 2, pages 29 – 54. Springer, Berlin, 2018.

Smart devices / Citizen Science



Zeit und Ort ?

Beginn: 07:00 08.10.2015

Ende: 13:00 09.10.2015

Ort: 95028 Hof

Medikation ?

Medikation: ja nein

Medikamente:

- Triptan
- Ibuprofen
- ASS
- Paracetamol
- Kombinationspräparat
- Metamizol
- Tramadol oder Tilidin
- Pfefferminzöl
- sonstiges

Besserung durch Medikamente: ja nein wenig

Andere Maßnahmen: ja nein

- Pause und Hinlegen
- Kühlen
- Kaffee
- sonstiges

Schmerzdaten ?

Intensität:

Starke Schmerzen, die hartnäckig, stechend und für den Patienten sehr erschöpfend sein können

Schmerzort: links

Schmerzart: pulsierend / pochend / klopfend

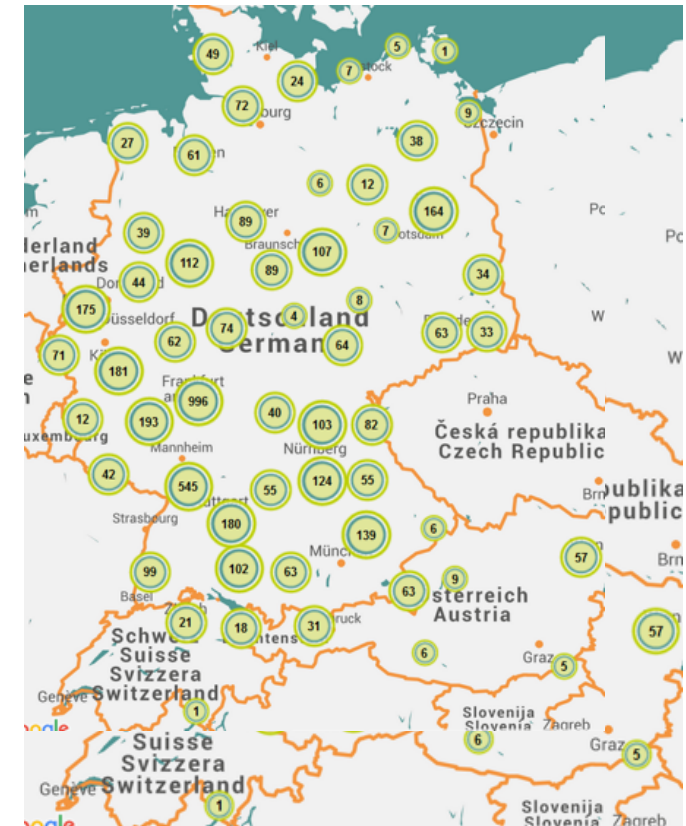
Wo begann der Schmerz: am Kopf

Begleitscheinung: (Übelkeit etc.) ja nein

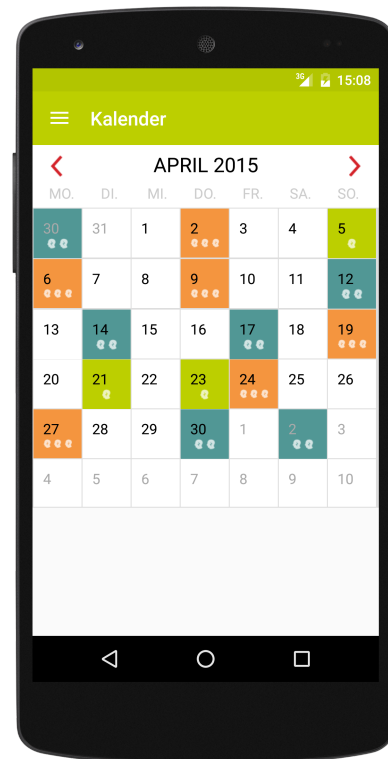
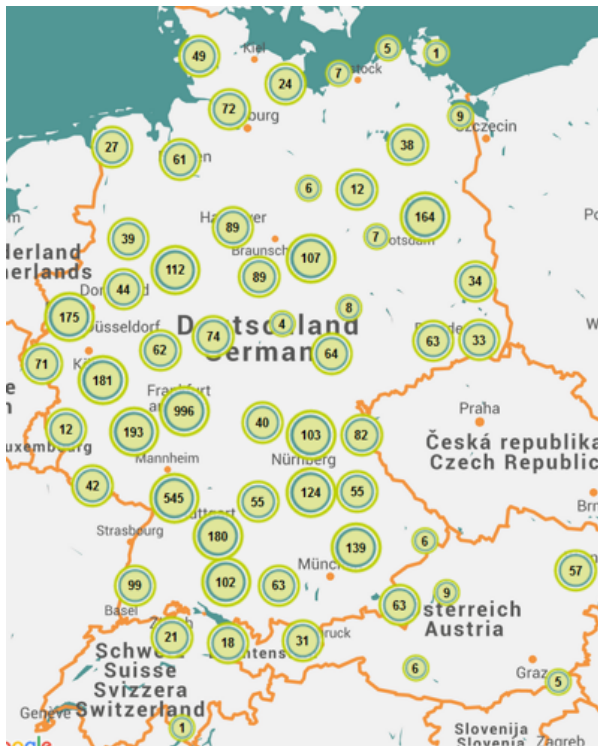
- Übelkeit
- Erbrechen
- Lichtempfindlichkeit
- Lärmempfindlichkeit
- Geruchsempfindlichkeit
- Rückzugs-/Ruhebedürfnis
- Bewegungsdrang
- Schwindel
- sonstiges

Behinderung von Aktivitäten: ja nein

Anzahl ausgefallener Arbeitstage: 2 Tage



Smart devices / Citizen Science



Hypothesen für Triggerfaktoren

Nahrungs- / Genussmittel

- Alkohol
- Geschmacksverstärker
- Histamin-haltige Nahrungsmittel
- Kaffee / Koffein
- Mangelernährung (z.B. Magnesiummangel)
- Wassermangel

Umwelteinflüsse

- Feinstaub
- Föhnwinde
- Vollmond
- (extreme) Wetterbedingungen
- Wetterumschwünge

Medikamente

- Häufige Einnahme von Triptanen

Aktivitäten

- Autofahrten
- extreme körperliche Anstrengungen

Körper & Psyche

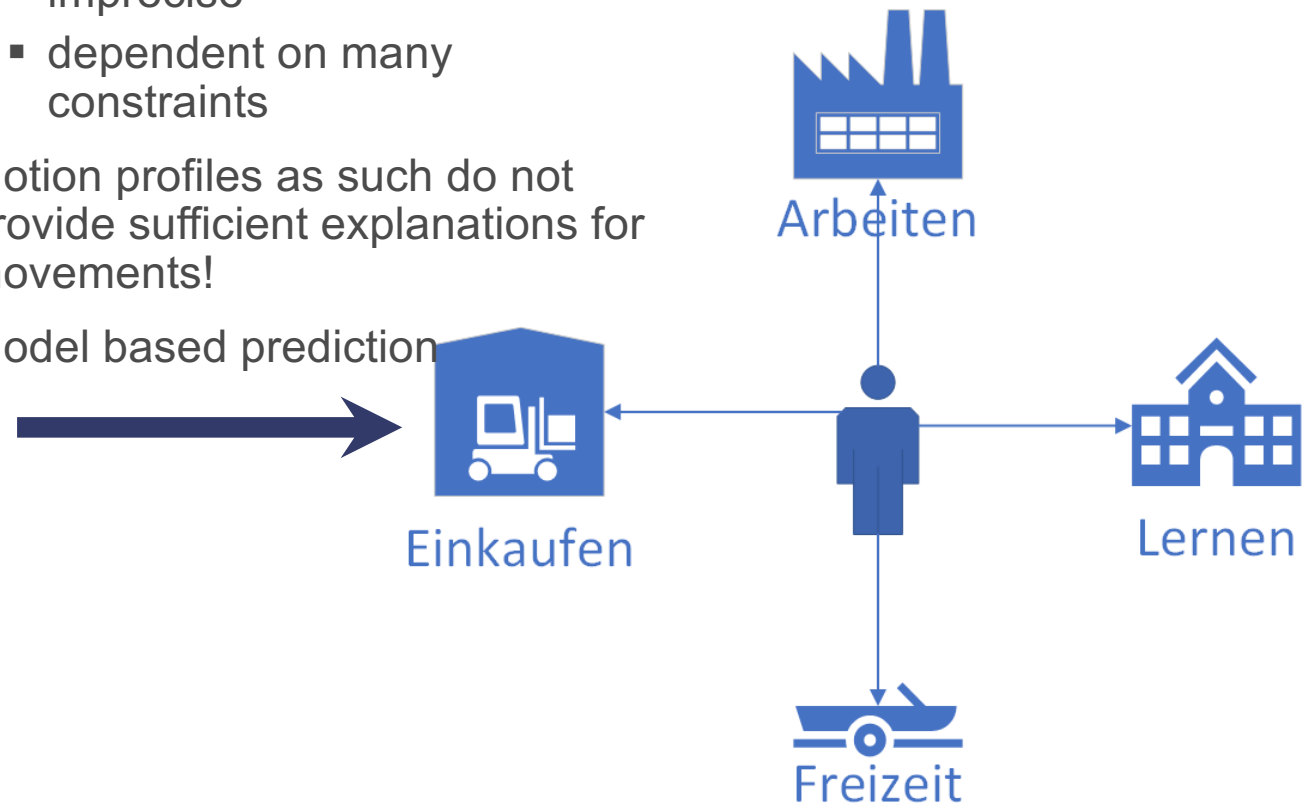
- Hormonstoffwechsel
- Menstruation
- Muskelverspannungen / Blockaden
- Psychische Faktoren
- Reize mit Lokalisation Nase
- Reizüberflutung
- Schlafmangel / Schlafmuster
- Stress
- Übersäuerter Magen
- Unglücklichsein
- Wechsel zwischen Anspannung und Entspannung

Kombinationen

- viel / wenig Nahrung + Wetterumschwung
- Kombination von Nahrungsmitteln
- Schlaf in überheizten Räumen + bestimmtes Nahrungsmittel oder Wetterumschwung
- Eisenmangel + körperliche Anstrengung

Digital Mobility

- Motion profiles are
 - incomplete
 - imprecise
 - dependent on many constraints
- Motion profiles as such do not provide sufficient explanations for movements!
- Model based prediction



Thanks for listening



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95028 Hof

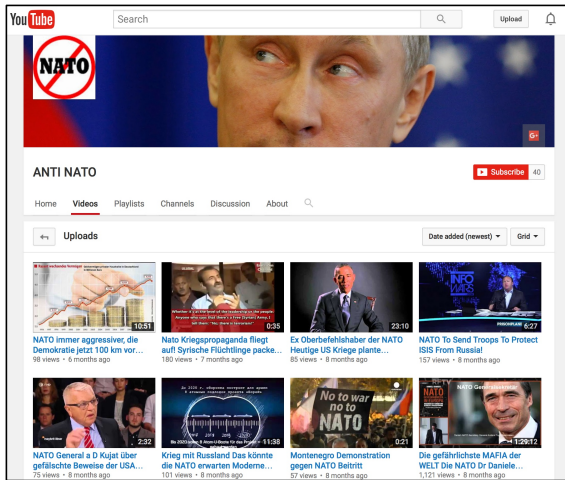
Phone +49 9281 409-4690
Fax +49 9281 409-55-4690

valentin.plenk@iisys.de
www.iisys.de

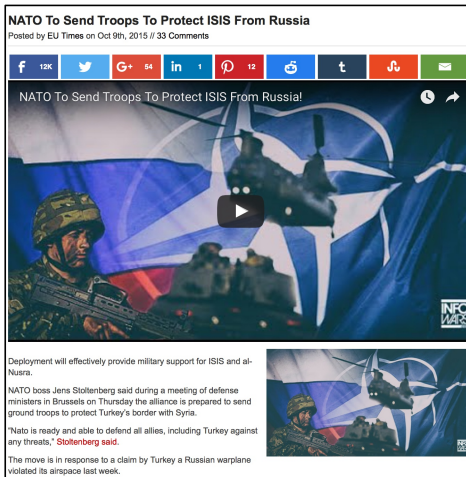
Deception, Disinformation, Digital Services in Cyber Environments

Nitin Agarwal (nxagarwal@ualr.edu)

Maulden-Entergy Endowed Chair and Distinguished Professor
Collaboratorium for Social Media and Online Behavioral Studies (COSMOS)
University of Arkansas – Little Rock



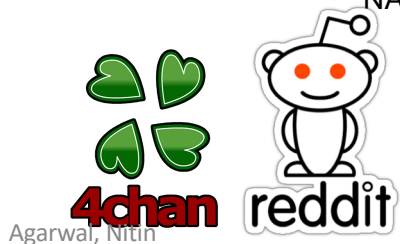
A YouTube channel with several Anti-NATO propaganda videos. The channel is called, "ANTI NATO".




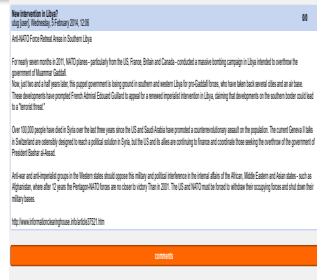
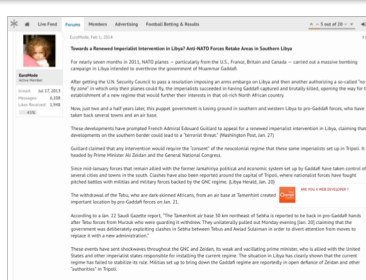
A blog using YouTube video to spread anti-NATO propaganda suggesting NATO's troops obstructing Russian operations in Syria thereby helping ISIS.





A blog using YouTube video to spread anti-NATO propaganda by suggesting NATO is waging war against Syrian refugees.



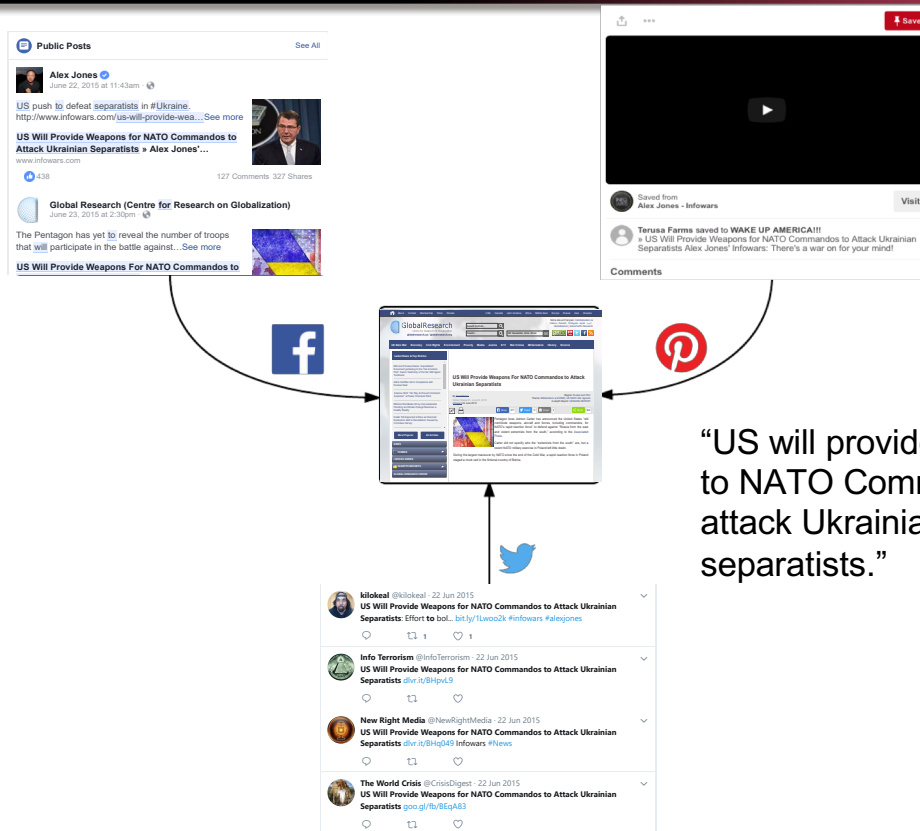
- **What is Cyber Forensics?**
 - It is the science of collecting, analyzing, and reporting of evidence in a legal way. These evidences can be used to detect or prevent a crime or a dispute where evidences are stored digitally.
- **What do we mean by Social Cyber Forensics?**
 - It is a branch of "Cyber Forensics" and defined as the process of investigating the relationships between "entities" (single actors, groups, organizations, nation-states, etc.) and revealing the digital connections among them in social media space by extracting/collecting metadata associated with their social media accounts, e.g., affiliations of the user, geolocation, IP address.

Towards a Renewed Imperialist Intervention in Libya? Anti-NATO Forces Retake Areas in Southern Libya

Cross Media Dissemination of Content

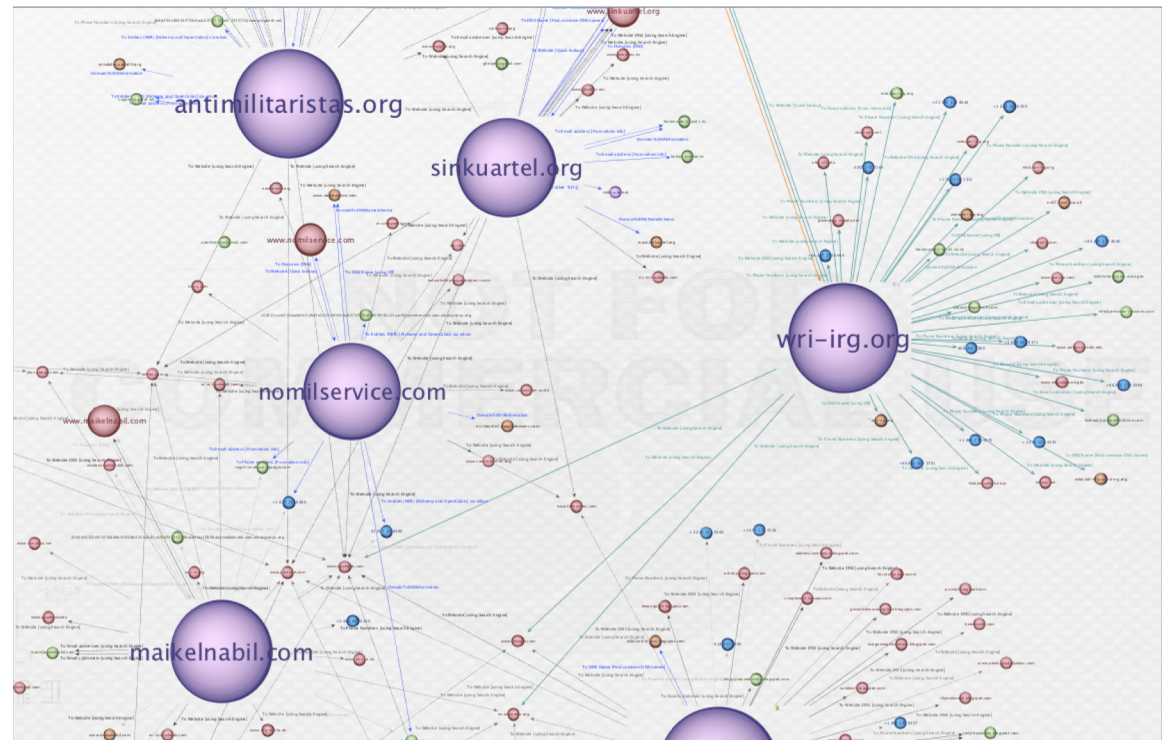


Cyber Forensic Analysis - Blogs

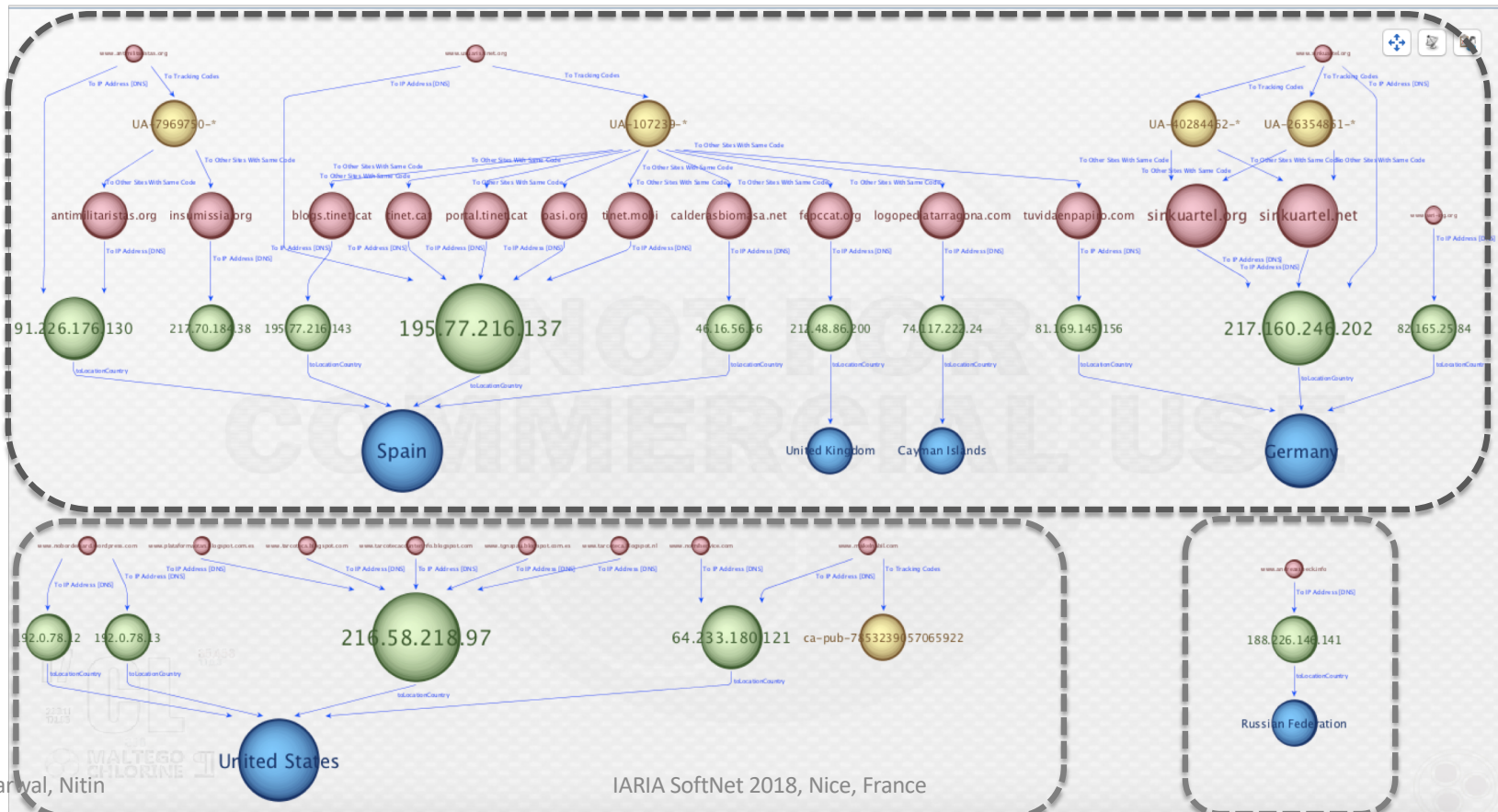
Case Study 1

Cyber forensic analysis helps extracting metadata, such as,

- Web traffic tracker codes (Google Analytics IDs)
- Email addresses
- IP address
- Contact details e.g., phone number
- Names under which the domain is registered
- Other digital presence e.g., Twitter handles, YouTube links, Facebook profile, other blogs, etc.



* Upcoming book on Social Cyber Forensics, Al-Khateeb & Agarwal (2018). Springer Briefs





Founder of



Founder of



affiliated to



Agarwal, Nitin @warresistant

IARIA SoftNet 2018, Nice, France

No Military Service Facebook page

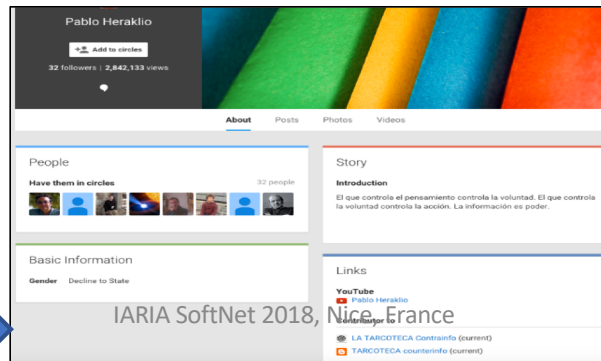


Blog in Spanish

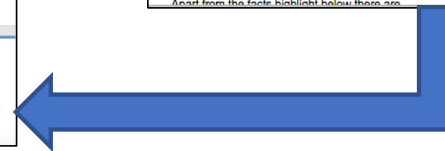
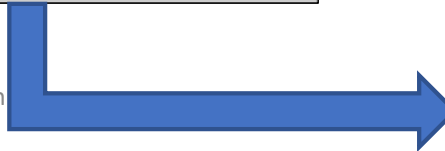


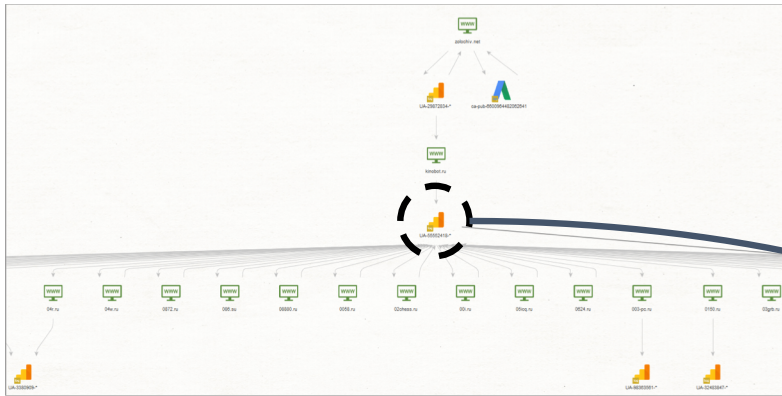
Same Blog in English

Blogger's Google Plus Profile

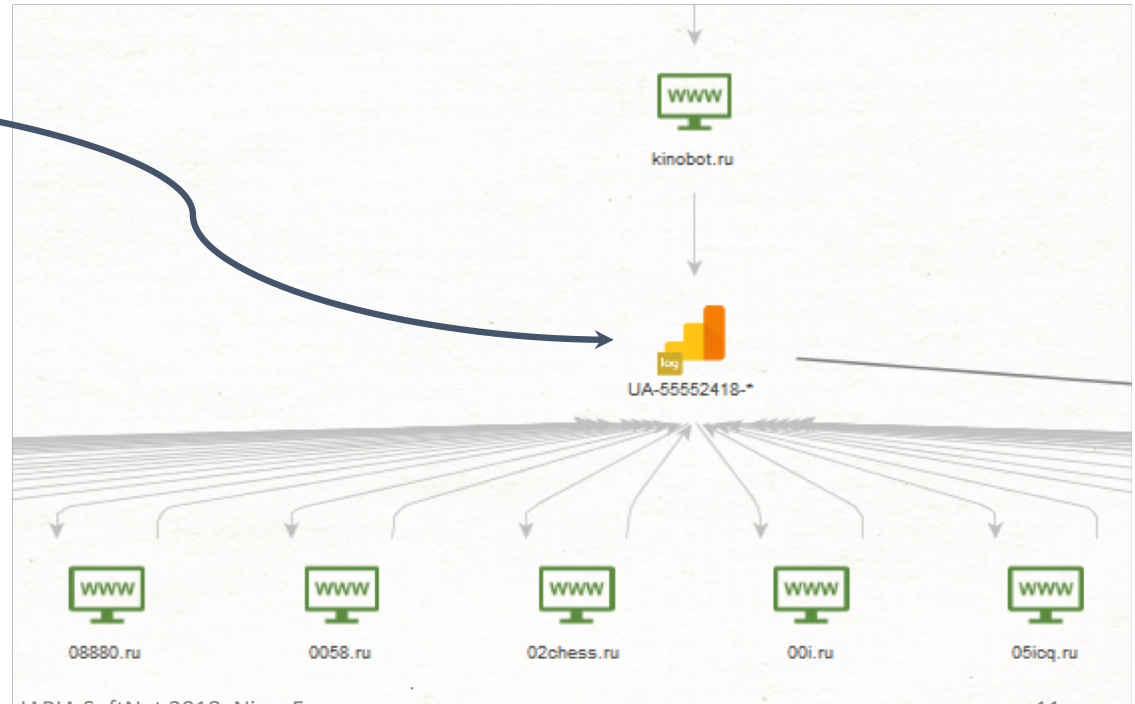


Agarwal, Nitin

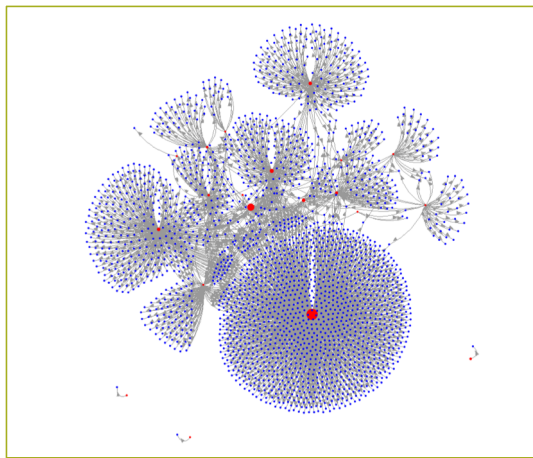




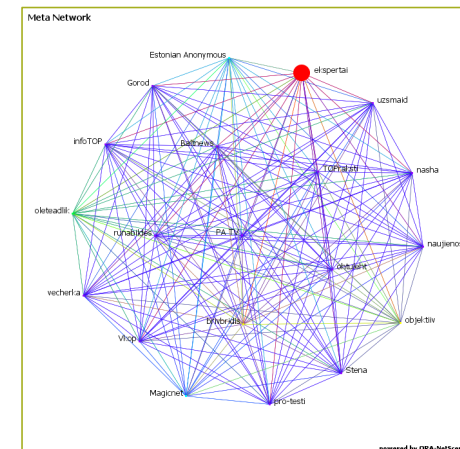
Automated Blog farms or *blog bots* observed



- Blogs mentioning Ukraine's recent political events (January 2018 onwards).
- Fabricate perception of a virtual crowd.



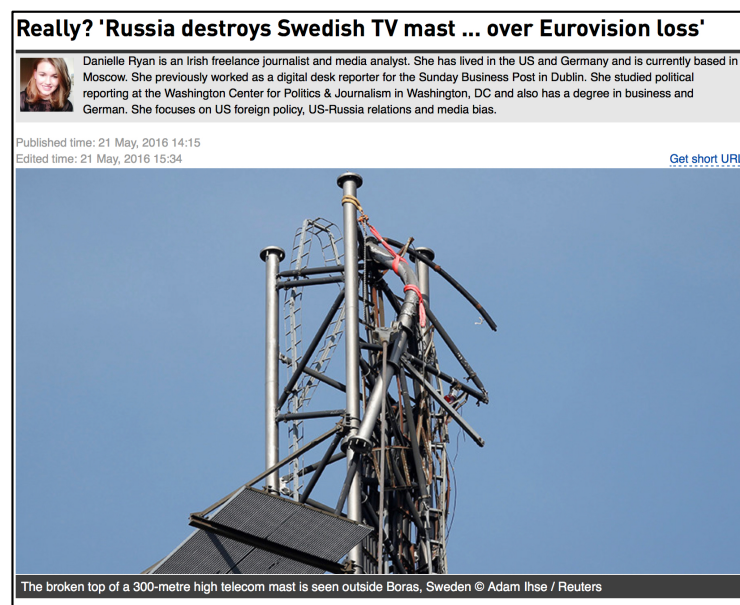
- The above figure is a network of blogsites and shared hyperlinks.
- The network contains 21 blogs (red nodes) and 2,321 hyperlinks (blue nodes).
- Size of a node is proportional to the number of hyperlinks (i.e., out-degree centrality).
- Edge thickness is proportional to the number of times a blogsite has a hyperlink.



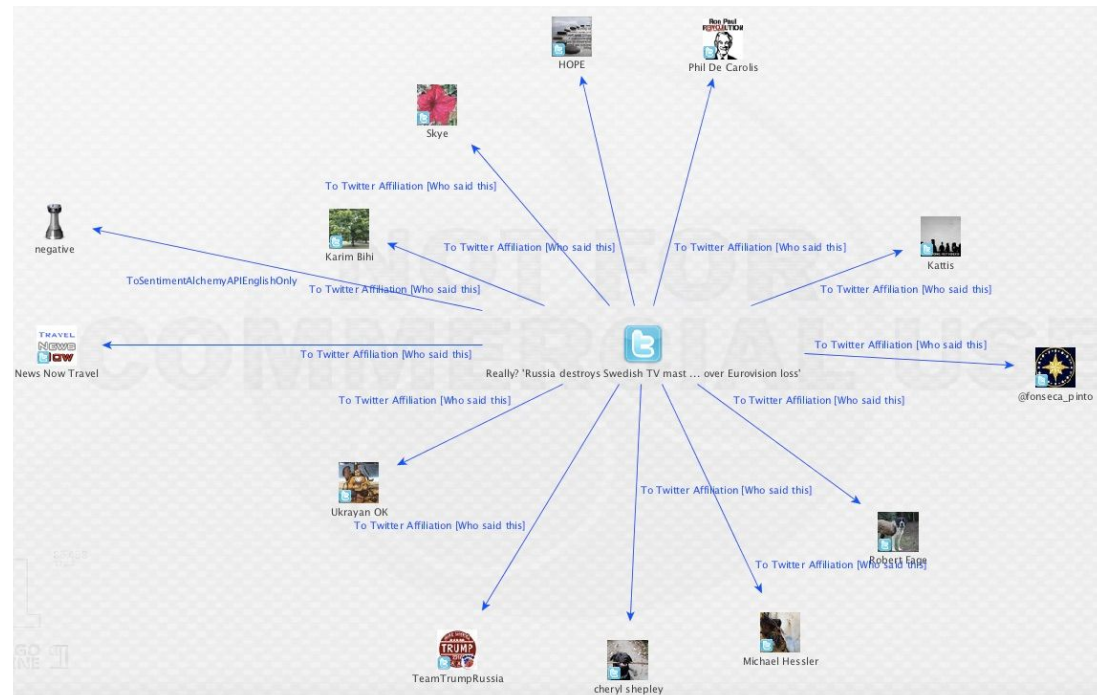
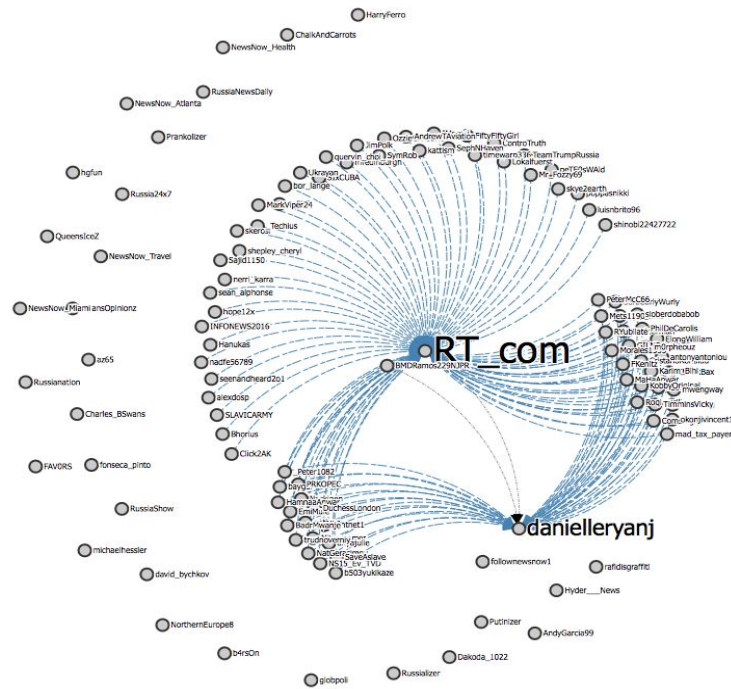
- The above figure is a network of blogs based on commonly shared hyperlinks.
- The network is fully connected, i.e., a clique, where every blog is connected with every other blog.
- This depicts massively coordinated information campaign



Reuters article on the destruction of Swedish TV mast.
Published: 18 May 2016. Last accessed: 03 June 2016.



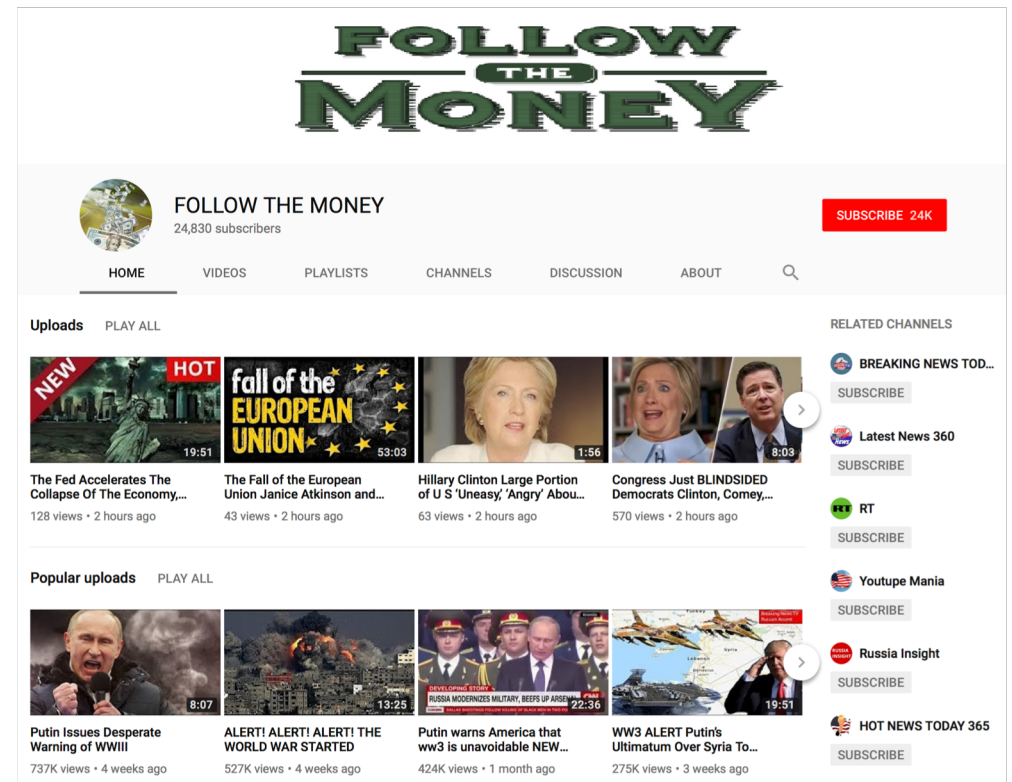
RT.com article mocking the Reuters article. Published: 21 May 2016. Last accessed: 03 June 2016.



Cyber Forensic Analysis – YouTube (vlogs)

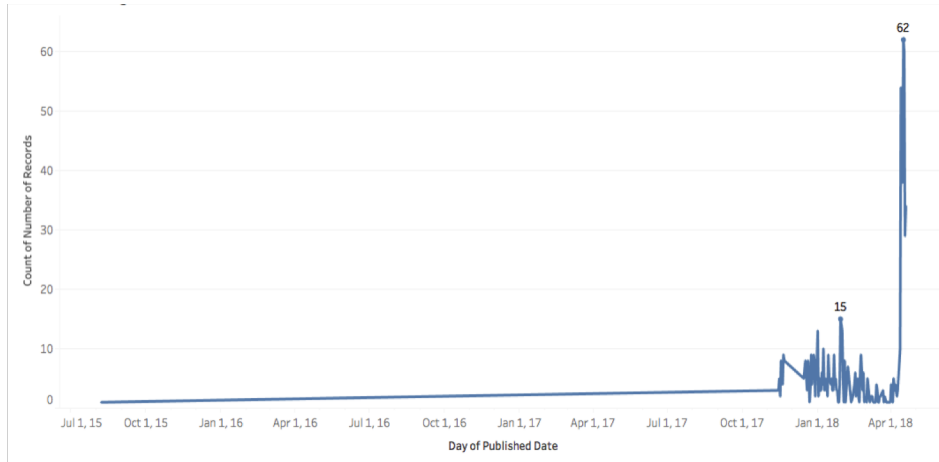
Case Study 2

- Total number of videos: 2,449
- Total number of views: 4,743,103
- Number of subscribers: 24,830
- Most videos posted in last week, yet received over 1,000,000 views in total.
- Related channels - RT, Russia Insight
- Collected 15,401 comments from 788 videos (data collection currently ongoing)

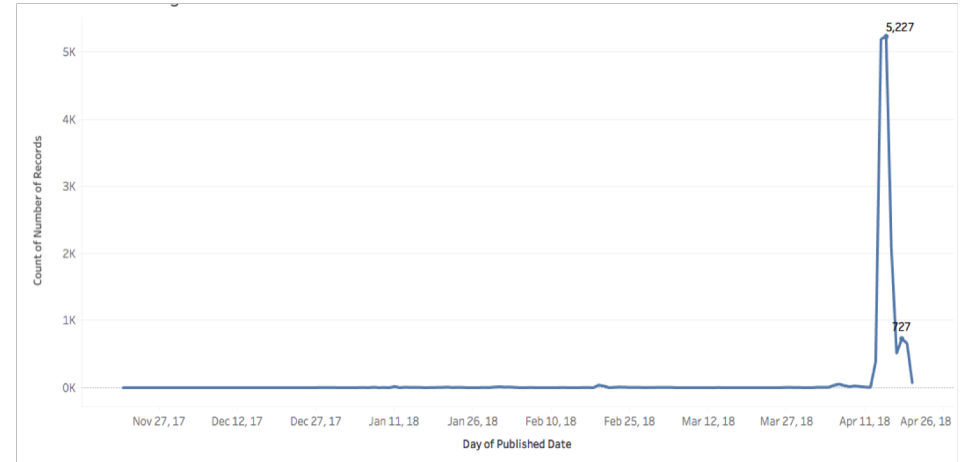


The screenshot shows the YouTube channel page for 'FOLLOW THE MONEY', which has 24,830 subscribers. The channel banner features the text 'FOLLOW THE MONEY' in a stylized, green, distressed font. Below the banner, there are navigation tabs for HOME, VIDEOS, PLAYLISTS, CHANNELS, DISCUSSION, and ABOUT. The 'Uploads' section is active, displaying a grid of video thumbnails. The first row includes videos such as 'The Fed Accelerates The Collapse Of The Economy...', 'The Fall of the European Union Janice Atkinson and...', 'Hillary Clinton Large Portion of U S 'Uneasy,' Angry' About...', and 'Congress Just BLINDSIDED Democrats Clinton, Comey...'. The second row, under 'Popular uploads', features 'Putin Issues Desperate Warning of WWII', 'ALERT! ALERT! ALERT! THE WORLD WAR STARTED', 'Putin warns America that ww3 is unavoidable NEW...', and 'WW3 ALERT Putin's Ultimatum Over Syria To...'. On the right side, there is a 'RELATED CHANNELS' section listing channels like 'BREAKING NEWS TODAY', 'Latest News 360', 'RT', 'Youtube Mania', 'Russia Insight', and 'HOT NEWS TODAY 365', each with a 'SUBSCRIBE' button.

Video Posting Trend



Comment Posting Trend



The sharp increase in number of videos posted and a similar increase in the number of comments is suspiciously interesting.

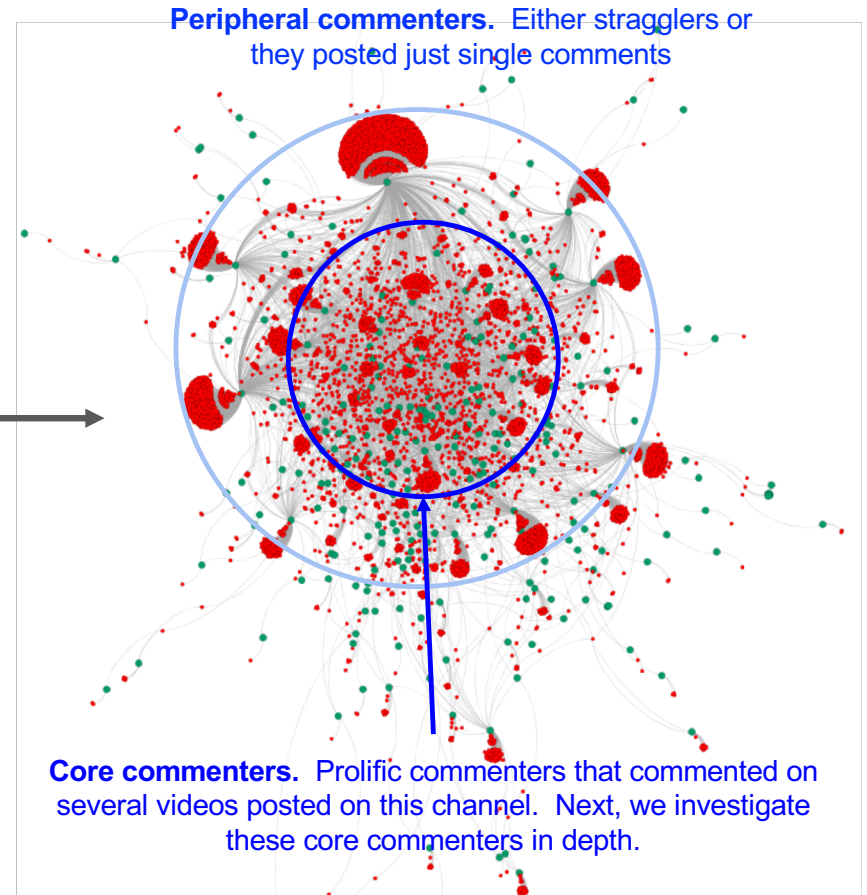


*Accepted at ASONAM



Red nodes are commenters

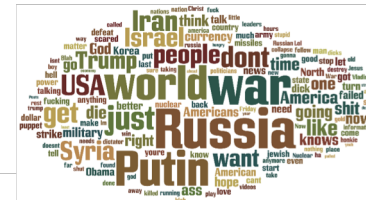
Green nodes are videos posted on 'Follow the Money' channel.



Analyzing core commenters reveal small but dense communities, i.e., group of commenters who have commented frequently on same set of videos.

**Accepted at ASONAM*

Word cloud of comments posted by the clique in 1



Word cloud of comments posted by brokers in 2, 3, and 4

73 comments out of 148

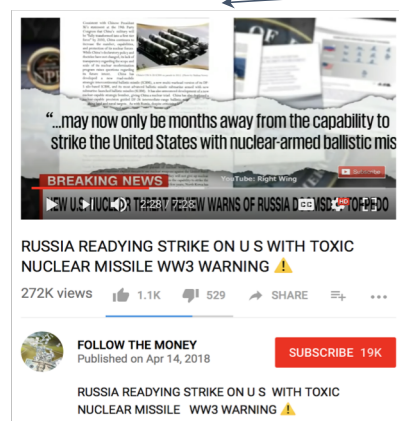
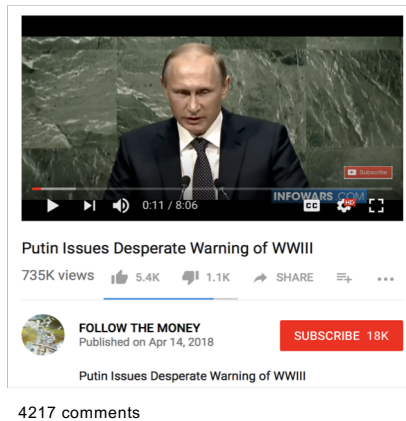
The clique (1) commented on 6 videos. Two most commented videos by the commenter clique are shown below.

69 comments out of 148

1 comments out of 3

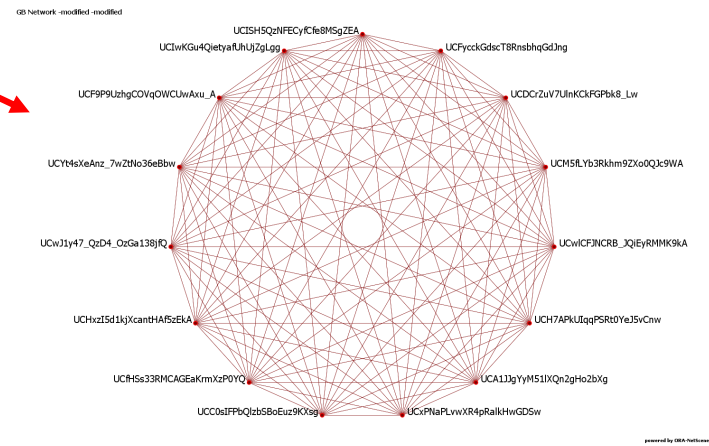
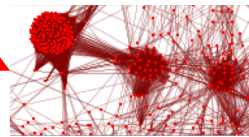
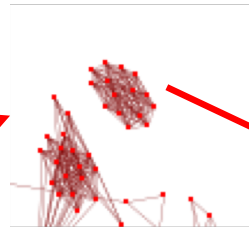
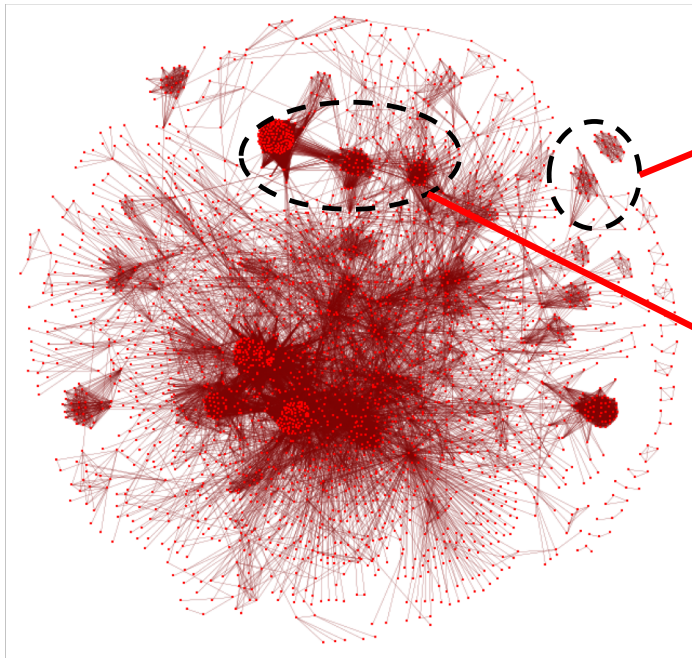
1 comments out of 3

4 comments out of 10



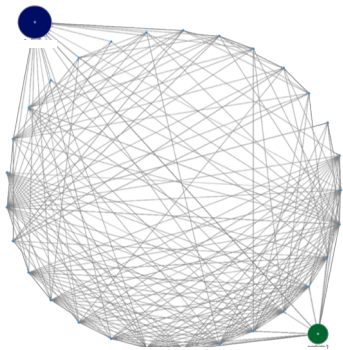
1976 comments

The commenter clique (1) is mainly amplifying the *ruussia, putin, world war* signal and the brokers (2, 3, 4) are connecting *trump* and other US political narratives (e.g., *jobs, elections, hillary*) to this conspiracy.

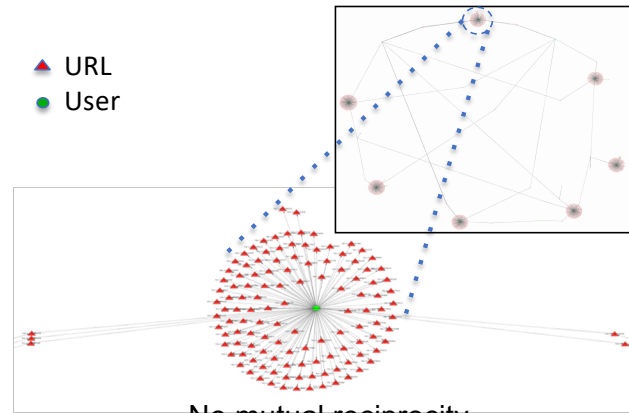


Commenter cliques observed

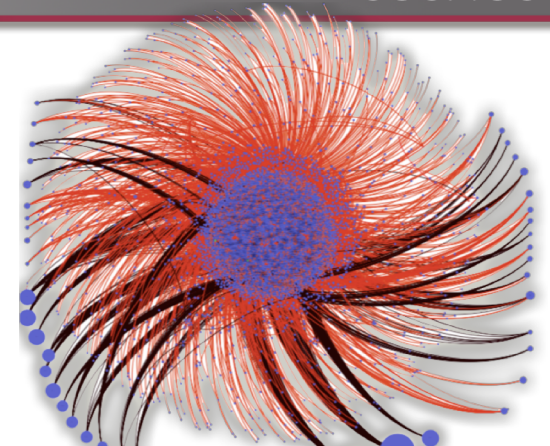
- Two commenters are connected if they commented on a video.
- Large Communities of commenters exist.



Mutual reciprocity.
IFYFM & FMIFY



No mutual reciprocity.
Coordination in information network



Organizational hierarchy.
Core and peripheral bots

COORDINATION/BEHAVIOR COMPLEXITY



Crimean Invasion 2014



Dragon Ride 2015



Trident Juncture 2015



ISIS Propaganda 2016

TECHNOLOGY

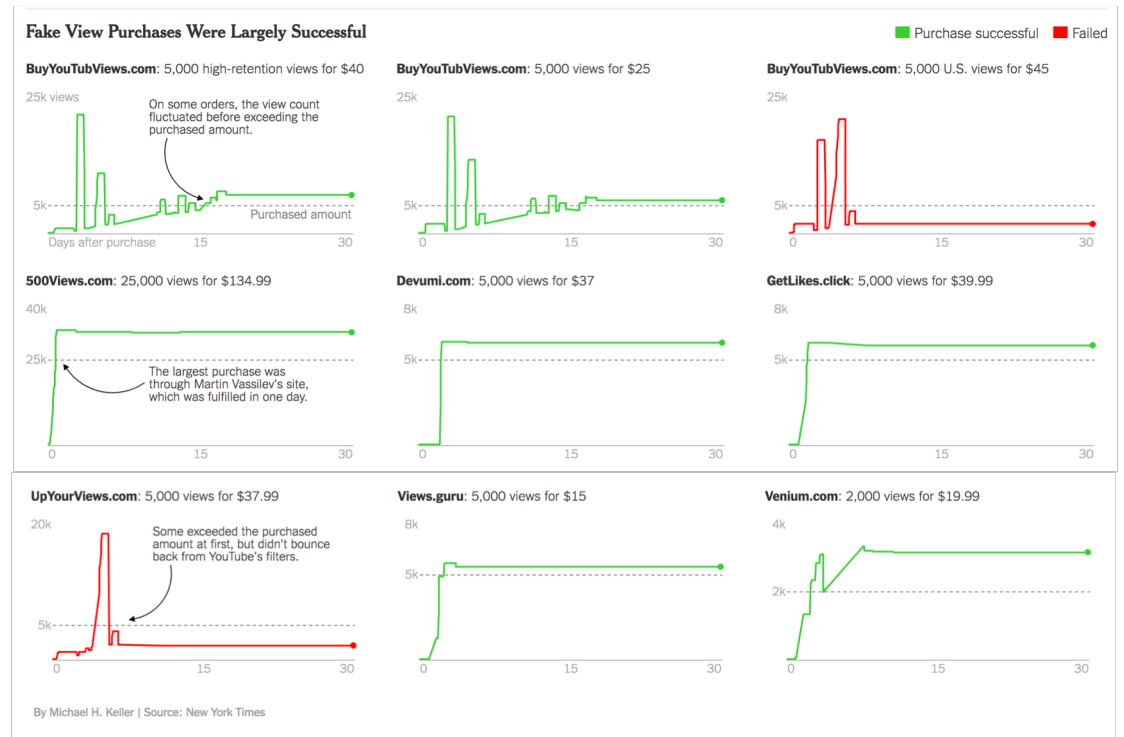


Interactive illustration by Adam Ferriss for The New York Times. Video footage by Scott Dalton, William Widmer, Joshua Lott and Martin Vassilev.

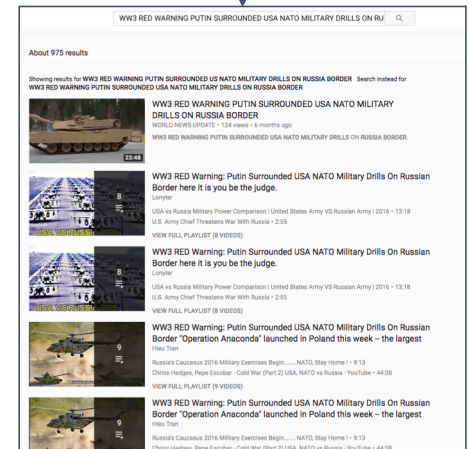
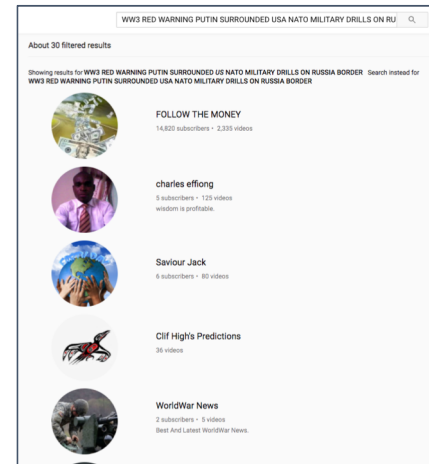
The Flourishing Business of Fake YouTube Views

Plays can be bought for pennies and delivered in bulk, inflating videos' popularity and making the social media giant vulnerable to manipulation.

By MICHAEL H. KELLER AUG. 11, 2018



- The same video appeared on YouTube in 2016, 2017, and 2018 on the following channels:
 - FOLLOW THE MONEY
 - Published on Apr 18, 2018
 - <https://www.youtube.com/watch?v=i9K1wYHYsak>
 - WORLD NEWS UPDATE
 - Published on Sep 20, 2017
 - <https://www.youtube.com/watch?v=rMQofGXhtVQ>
 - SHOCK NEWS
 - Published on Apr 26, 2017
 - <https://www.youtube.com/watch?v=WONxppeB3wk>
 - Julian Assange TV
 - Published on Dec 3, 2016
 - <https://www.youtube.com/watch?v=Ijd-FtnWFew>
 - Doll Channel
 - Published on Nov 6, 2016
 - <https://www.youtube.com/watch?v=OzuWOxXHIP4>
 - Robert Christiansen
 - Published on Oct 11, 2016
 - <https://www.youtube.com/watch?v=JJA41eD59-l>
 - Flat Earth Verified
 - Published on Jul 4, 2017
 - <https://www.youtube.com/watch?v=KT-OxdVMFsg>



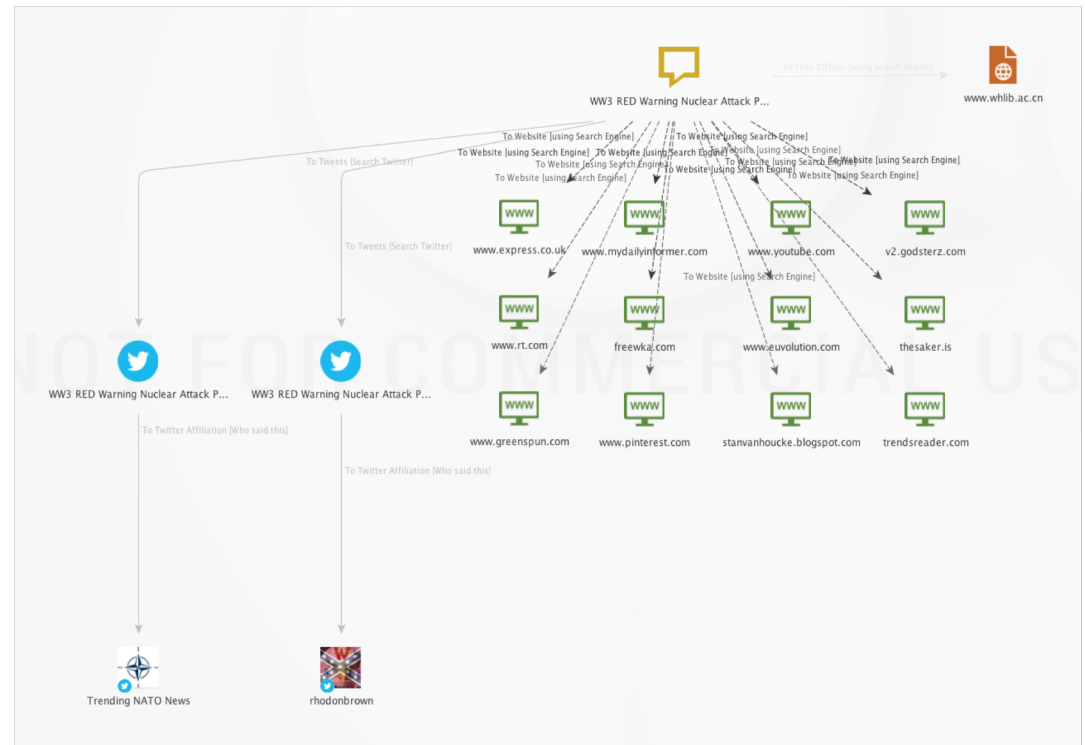
The same video was shared 975 times by 30 YouTube channels.

The title of the video was tweeted by the following Twitter handles:

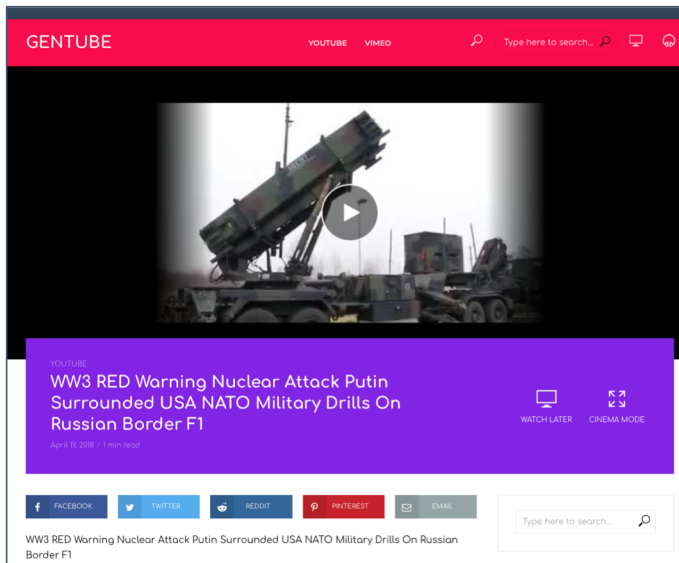
- Trending NATO News
- @NATOlizer
- Faramarz Kashigari
- @farazkashigari
- Rhodonbrown
- @rhodonbro

The video is related to the following domains:

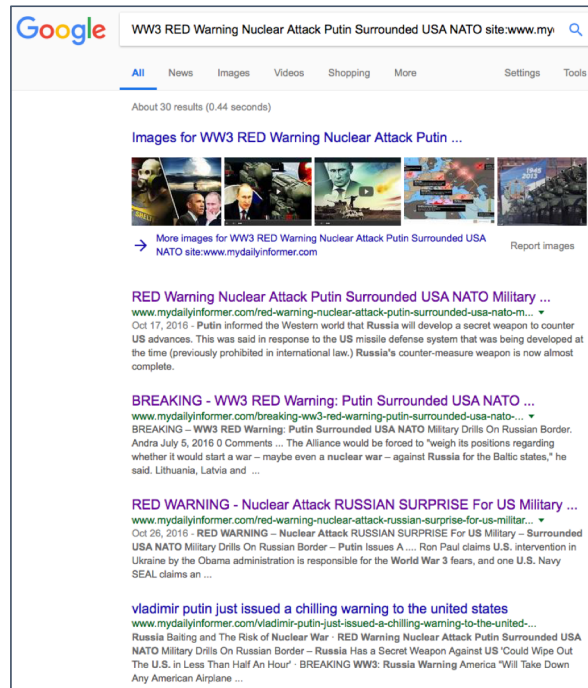
- www.stanvanhoucke.blogspot.com
- www.freewka.com
- www.evolution.com
- www.thesaker.is
- www.trendsreader.com
- v2.godsterz.com
- oriharu.net
- www.whlib.ac.cn
- www.express.co.uk
- www.pinterest.com
- www.greenspun.com
- www.mydailyinformer.com
- http://revolutionradio.org
- http://beforeitsnews.com



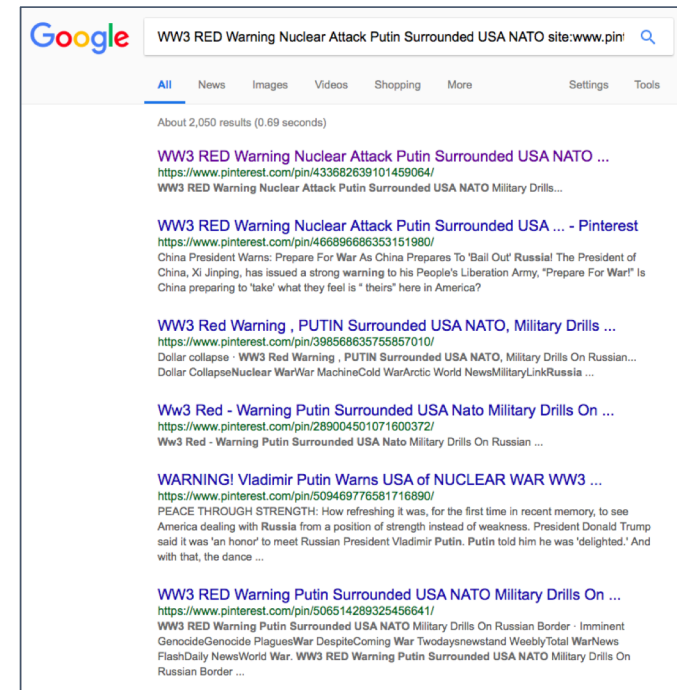
*Accepted at ASONAM



The video also appeared on GenTube.co which is a SUSPICIOUS video website



The title of the YouTube video appeared on www.mydailyinformer.com which does not exist anymore.



The title of the YouTube video appeared on multiple Pinterest pages.

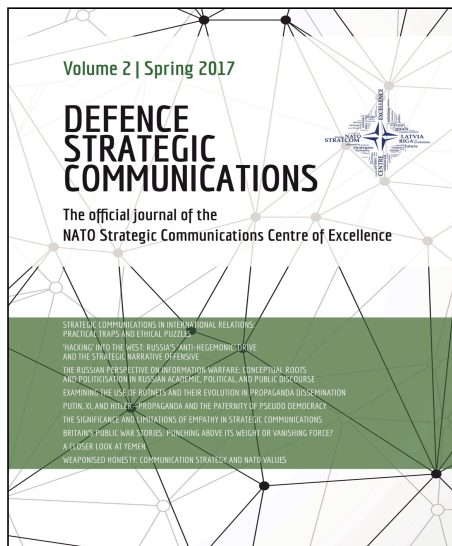
- Data collection/data retention/data sharing policies
- Privacy (GDPR, etc.)
- How we can advance the debate over social cyber security leading to policy and action in the cyber diplomacy space.



Samer Al-khateeb and Nitin Agarwal. Social Cyber Forensics. Springer Briefs in Computer Science. Fall 2018.



Nitin Agarwal, Nima Dokoohaki, Serpil Tokdemir. Emerging Research Challenges and Opportunities in Computational Social Network Analysis and Mining. Lecture Notes in Social Networks. 2018.



Samer Al-khateeb, Nitin Agarwal, Rick Galeano, and Rebecca Goolsby. Examining the Use of Botnets and their Evolution in Propaganda Dissemination. *Journal of NATO Defence Strategic Communications*, Vol. 2, pp. 87-112. 2017.



Nitin Agarwal and Kiran Kumar Bandeli. Blogs, Fake News, and Influence Operations. *Digital Hydra: False Information Online as a Weapon*, NATO StratCom COE, November 2017.

- Tools Developed:
 - Blogtrackers - <http://blogtrackers.host.ualr.edu/>
 - YouTubeTracker - <http://youtubetracker.host.ualr.edu/>
 - Focal Structure Analysis - <http://fsa.host.ualr.edu/>
- Follow us: **@cosmographers**



Blogtrackers

 YouTubeTracker



FOCAL
STRUCTURE
ANALYSIS

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