Early detection of radicalized individuals

• Concept

• Use cases:
  Crisis Management
  Gelocations / Identities validation

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Fanch FRANCIS
• 18 years of intelligence exploitation of the internet for the French Ministry of Defence
• Doctoral student, thesis: Social Media as a weapon of war
• Founder of OAK Branch, Associate

Emmanuel JACQUE
• 25 years in Military Intelligence
• Plans and Strategy Manager, Near and Middle East at the Fr-MoD Operations Centre
• Former OAK Branch CEO, Associate Fraud & Security Intelligence Solutions @ SAS Institute
DETECTION

HOW

- **Semantic** and semiotic analysis of content
- **Analytics** performed on the meta-data
- **Link analysis** of contents and meta-data

WHAT FOR

- Reconstruction of the **social environment** of individuals and groups
- Fact: if the individual profile converges towards a group profile then the individual is at risk or represents a risk

FOR WHOM

- Law enforcement (Police, Intelligence, etc.)
- Any Org / company that needs to identify a risk:
  - Other Gov. (social aide allocation, migration)
  - **Banks** (frauds, cyber threats), **Transports** (IE Railways: Frauds, malicious act, delinquency), **Insurance, Energy**
  - Any organisation that needs anticipation, that owns sensitive facilities

SOURCES

- Open and closed sources
- Deep Web
- Dark Net
- GSM Data
- Forensic

Data owned by private companies or organisations
Social media is based upon social networking, they are constantly used in every contention from protest to civil war.

- Georgia 2008
- Moldova 2009
- Iran 2009
- Tunisia 2010
- Egypt 2011
- Libya 2011
- Syria 2011
- Azerbaïdjan 2012
- Ukraine 2014
- …

Social media are used in every form of radicalization whether religious, political or ideological

- Framing
- Preaching
- Recruiting
- Financing
- …

Monitoring, exploitation and analysis of social media is an essential part of securing our societies
### ABOUT SOCIAL MEDIA ANALYSIS

<table>
<thead>
<tr>
<th>Identification</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Statistical analysis</strong> is a proven mean to describe an event: <strong>what, when, where?</strong></td>
<td><strong>Identify</strong></td>
</tr>
<tr>
<td>Impact study of external communication (re-tweet numbers, sentiments analysis, etc.)</td>
<td><strong>Opinion leaders</strong></td>
</tr>
<tr>
<td><strong>Statistical analysis</strong> can not explain an event</td>
<td><strong>Influential broadcasters</strong></td>
</tr>
<tr>
<td>Who initiated, who contributed, etc.?</td>
<td><strong>Active users</strong></td>
</tr>
<tr>
<td><strong>Link analysis</strong> can help visualise, understand and explain events: <strong>who, how, why?</strong></td>
<td></td>
</tr>
<tr>
<td>Highlighting links between:</td>
<td></td>
</tr>
<tr>
<td>- Individuals</td>
<td></td>
</tr>
<tr>
<td>- Individuals and groups</td>
<td></td>
</tr>
<tr>
<td>- Individuals and documents, thematic</td>
<td></td>
</tr>
<tr>
<td>- Documents and thematic</td>
<td></td>
</tr>
<tr>
<td>- Thematic between them (causality)</td>
<td></td>
</tr>
</tbody>
</table>
USE CASES (NOT LIMITED TO…)

Intelligence & Security :
➢ Early detection of radicalized individuals helps prevent terrorism by scoring high risks people
➢ Organized Crime get the network insights
➢ Cyber & Hybrid warfare understand the attacker environment and its supports
➢ Cyber security Score vulnerabilities and prioritize systems updates
➢ Military intelligence Know your enemy network and TTPs*

Business :
➢ Find out who are the key players enrich biographies
➢ e-reputation manage the image of a brand, a person
➢ Risk mitigation while recruiting new people, performing investments
➢ Identify counterfeit goods and distribution networks

*Techniques, Tactics, and Procedures
1. Statistic analysis - BEHAVIOUR

2. Semantic / Semiotic analysis - TOPICS

3. Relational analysis - NETWORKS

Crawl

Social media
FB, Twitter
YouTube
Websites
Forums
Comments
Articles

Meta
Tex
Video
Sound
Image

Semantic spaces

Semiotic spaces

Categorization

Automatic entity extraction

Computer assisted analysis

Characterization

Groups
Individuals
Aliases
Logos / Avatars
Documents
Places
Events

Anticipation / Decision support

CONCEPT (special mention, Nec Mergitur, Paris 2016)
Clusterization

Enrichment (tagging)

Categorization

Level 2 (ontologies)

French, English, Arabic (including dialects)

Grammatical analysis
Syntax analysis
Knowledge extraction
Consolidation
Named entries transliteration

Reasoning & Enrichment

Relation links extracted, timed and positioned

Characterization & profiling
(Groups, individuals, places, events)

Knowledge base
Reverse links

Statistical analysis
(Meta data & content)

Semantic analysis

Level 1 (Algebra method)

Level 2 (ontologies)

Relational analysis
(understanding & representation)

Collection

Filtering & Focalization

Fusion Exploitation

IP: 201.1.42.37
Latitude: N48°51'12"
Longitude: E002°20'55"

Event

©OAK Branch SAS, DETECTION Project, mars 2016

@xxx
Data integration
BIG DATA (Hadoop)
ETL Connectors

METHODS

Data exploration & Analysis - Analytics
Exploration, statistics, patterns discovering, rules engine

FUNCTIONS
Real time MONITORING
ALERTS

PRODUCTS
➢ Dashboards, graphs, clouds,
➢ Direct access to documents suggested by alert engine

➢ Network graphs (individuals and groups) for queries, based on contextual information
➢ Named entities
➢ Events
➢ Qualified links
➢ Geolocation

SOCIAL NETWORK ANALYSIS

Social Network Analysis
Visual analysis of networks:
- individuals
- documents
- events
- goods

➢ Catégorization
➢ (by subject)

SCORING

➢ Network graphs (documents and subjects) for queries based on subjects of interest
➢ Causes and consequences
➢ Timelines

DATA INTEGRATION
BIG DATA (Hadoop) ETL Connectors

SEMANTICS

Semantics
Discover new languages
Understand networks (based on subjects and contents)
Discover new groups

Grammatical analysis
Syntax
Entity extraction
Consolidation
Concept translation

OAK Branch SAS, Projet DETECTION, oct 2016
Twitter Analysis NodeRed 29/03/2017 SAS SWA
Demo based on:

Mentioned / in Reply to (@)

actor A

Tweet

actor B

RT

Tweet 1

Tweet 2

# L

# 1

Fussenweg

AND

Actor

AND

RT

AND

Tweet

AND

user mentioned on reply
Using Statistical Analysis Software (SAS)

Social Media Data Modeling

Tweet

AND

RT

AND

User

Mentioned

or Reply

Mentioned

In Reply to (@)

Tweet

RT

#
Orientation by TECHNICAL DATA ANALYSIS

Behavior analysis based on activity analysis. First step to direct the investigation based on behavioral criteria.
L'ANALYTIQUE AVEC SAS

DES ANALYSES RICHES AVEC UNE MANIPULATION SIMPLE

Prévisions, simulations, arbres de décision, cartographie...
Orientation by THEMES / LANGUAGES

22 Languages, transnational phenomena detection and link, to orientate further investigations.

Method 2
Orientation by TOPICS (CA)

Advanced analytics
• Activity peaks
• Geolocation
• Behavior

Data integration
Data preparation & Load

Content analysis
Detection & Analysis:
• Languages
• Topics

Networks analysis
Individuals linked by (Tweets / RT / #)

RESULTS
Orientation by THEMES / LANGUAGES
Le big data n'est plus la problématique des seules DSI. Au-delà du volume des données, il faut voir leur variété, leur hétérogénéité et par conséquent leur richesse.
Orientation by RELATIONSHIPS

Network structure analysis based on technical data to orientate further investigations on behaviors and topics of interest

Method 3
Orientation by RELATIONS (SNA)

Advanced analytics
• Simultaneous activity
• Level of actors
• Momentum
• Gelolocation

Content analysis
- Detection & Analysis:
  • Topics
  • Network of Topics linked by contents

Data integration
- Data preparation & Load

Networks analysis
- Focus on a group of individuals
Réduire le Supercluster

Approche hybride de détection

- Analytique des réseaux
- Text Mining
- Modélisation prédictive
- Détection d’anomalies
- Règles métier
Advanced analytics

Behavior breakouts
- When?
- Who?
- Where?

Content analysis

Topics of Interest
- What?
- Which Subjects?

Networks analysis

Relationships
- With whom?
- How?

Dissemination

FUSION of Methods 1, 2 & 3 => MATCH

INDIVIDUALS or GROUPS profiling
SCORING of INDIVIDUALS & GROUPS (risk exposition or risk level)
The Intelligence cycle within the SAS Platform

- Streaming
- Data integration
- Data Quality
- Data Federation
- Master data Mgmt

- Automation
- Data integration
- Data Quality
- Data Federation
- Master data Mgmt

- Business rules
- Scoring
- Modeling

- Statistics (desc./pred./presc.)
- Text analysis
- Link analysis

* Third party software
DÉTECTION D’ÉVÉNEMENTS PAR ANALYSE DES DONNÉES TECHNIQUES

OAK BRANCH KNOWLEDGE MANAGEMENT
Social Media UKR 2014 : Accounts detection based on activity changes
Social Media UKR 2014: Filtering the top followed accounts

![Graph showing the number of followers in millions and the number of tweets.](image)

### Nombre de Followers (millions)

- **BBC Breaking**: 8
- **BBC World**: 5
- **Vera Brezhneva**: 4
- **muz_tv**: 3
- **ARTEM_KLYUSHIN**: 2
- **trina_kandelaki**: 1
- **YourGreatNews**: 1
- **KimLem Russia**: 1
- **wst_news**: 1
- **anekdotru**: 1

### Nombre de tweets

- **body**: “Очень не нравится. Его создают.” Создан МКЛ.

- **body**: "Ukraine Billionaires Desert Yanukovych After EU Accord Reversal". 
  http://t.co/GUJ9sMx via @SW #Украина #Киев #Kiev
  Boxing Champ Vacates Heavyweight Title for Ukraine Presidential Run
  http://t.co/2CCxPR via @msn. #Украина #Киев
  Clashes End at Kiev Rally
  http://t.co/89U2ZD via @RFEERU #Украина #Киев #Kiev
  RT @BBCNews: Kiev. Now http://t.co/CHkGpCV // #Украина #Україна #Київ #Україна
  RT @vserita: @poltrash: Евромайдан http://t.co/2rCl5S1H7s ГеоБлако: средняя стоимость #Украина #майдан #евромайдан #украина

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Social Media UKR 2014: Who are the most active influential accounts?
Social Media UKR 2014: Close up on the most followed accounts
Social Media UKR 2014 : virality ?

Viralité moyenne : 32,1
Viralité Maximum : 77

<table>
<thead>
<tr>
<th>Nom d'utilisateur</th>
<th>Nombre de Posts</th>
<th>Nombre de Retweets</th>
<th>Nombre de tweets/Retweet</th>
<th>Nombre de Followers</th>
<th>Nombre d'amis</th>
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<tbody>
<tr>
<td>vesti_news</td>
<td>39</td>
<td>1</td>
<td>40</td>
<td>903 549</td>
<td>37</td>
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</tbody>
</table>

Appuyez sur F11 pour quitter le mode plein écran.
### Social Media UKR 2014: Spammers?

<table>
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<tr>
<th>Nom d'utilisateur</th>
<th>Nombre de Retweets</th>
<th>Nombre de tweets/Tweet</th>
<th>Nombre de Post</th>
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<td>inewsua</td>
<td>652</td>
<td>652</td>
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<td>ksuly908</td>
<td>623</td>
<td>624</td>
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<tr>
<td>info78598314</td>
<td>507</td>
<td>508</td>
<td>1</td>
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<tr>
<td>ukpravda_news</td>
<td>461</td>
<td>396</td>
<td>88</td>
</tr>
<tr>
<td>fut_oks</td>
<td>410</td>
<td>413</td>
<td>5</td>
</tr>
<tr>
<td>hohlow_a</td>
<td>401</td>
<td>403</td>
<td>2</td>
</tr>
<tr>
<td>korall8</td>
<td>401</td>
<td>406</td>
<td>5</td>
</tr>
<tr>
<td>LChaussy</td>
<td>396</td>
<td>491</td>
<td>3</td>
</tr>
<tr>
<td>Andimko</td>
<td>389</td>
<td>409</td>
<td>20</td>
</tr>
<tr>
<td>Kocheseny</td>
<td>380</td>
<td>392</td>
<td>12</td>
</tr>
</tbody>
</table>

#### Diagram

Chart showing the number of tweets Retweeted from November 2013 to May 2014.
Social Media UKR 2014: What is Retweeted the most?
Social Media UKR 2014 : #Hashtags
Processus d’Analyse textuelle

Workflow
Social Media UKR 2014: Tweet inspection

Table des tweets

<table>
<thead>
<tr>
<th>Contenu du tweet</th>
<th>Date du tweet</th>
<th>Heure du tweet</th>
<th>Utilisateur</th>
<th>Nombre de followers</th>
<th>Nombre de retweets</th>
</tr>
</thead>
<tbody>
<tr>
<td>#Славянки: ТЕРРОРИСТЫ ГОТОВЯТ ПРОВОКАЦИЮ С ГИБЕЛЬЮ МИРНЫХ ЖИТЕЛЕЙ <a href="http://t.co/CanA9yvpAf">http://t.co/CanA9yvpAf</a></td>
<td>02/05/2014</td>
<td>10:08:45</td>
<td>kalashnikova</td>
<td>2374</td>
<td>1980</td>
</tr>
<tr>
<td>#Днепр #Одесса #Днепропетрополис #Кривойр #Луганск</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

37
Social Media UKR 2014: Original Tweet (information source)

Top 10 des Twittos les plus retweetés

<table>
<thead>
<tr>
<th>Utilisateur</th>
<th>Nombre de tweets</th>
<th>Nombre de followers</th>
<th>Nombre de retweets</th>
</tr>
</thead>
<tbody>
<tr>
<td>serge61</td>
<td>7</td>
<td>950</td>
<td>38.00</td>
</tr>
<tr>
<td>CloudieBH</td>
<td>2</td>
<td>6009</td>
<td>24.00</td>
</tr>
<tr>
<td>roman_piro3vye</td>
<td>2</td>
<td>1013</td>
<td>49.00</td>
</tr>
<tr>
<td>BULLK17</td>
<td>1</td>
<td>10177</td>
<td>36.00</td>
</tr>
<tr>
<td>kasperskotka</td>
<td>1</td>
<td>2234</td>
<td>158.00</td>
</tr>
<tr>
<td>ponomarenko_r</td>
<td>1</td>
<td>7516</td>
<td>42.00</td>
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<tr>
<td>nemdaeli</td>
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<td>378</td>
<td>28.00</td>
</tr>
<tr>
<td>PravdaFatou</td>
<td>1</td>
<td>7699</td>
<td>52.00</td>
</tr>
<tr>
<td>rianu</td>
<td>1</td>
<td>623271</td>
<td>51.00</td>
</tr>
<tr>
<td>zwarnog99</td>
<td>1</td>
<td>14418</td>
<td>28.00</td>
</tr>
<tr>
<td>Contenu du tweet</td>
<td>Date du tweet</td>
<td>Heure du tweet</td>
<td>Utilisateur</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Судя по поступающей информации сепаратистам в #Славянск приходит люди. Пришел час расплаты, сухой Смерть врагам!</td>
<td>02/05/2014</td>
<td>21:43:04</td>
<td>roman_primorye</td>
</tr>
<tr>
<td>Террористы в #Славянск готовятся осуществить массовую людоеднюю людей с целью имитировать зверства украинских саперов. <a href="http://n.com/Qgsy1td0">http://n.com/Qgsy1td0</a></td>
<td>02/05/2014</td>
<td>21:03:15</td>
<td>roman_primorye</td>
</tr>
</tbody>
</table>
Social Media UKR 2014 : Topics analysis (Themes)
Social Media UKR 2014: Topic = “Violence”
Social Media UKR 2014: Topic = "violence" – account focus
Social Media UKR 2014: account focus: Vladtime
Social Media UKR 2014 : Text extraction (Weapons)
Social Media UKR 2014: Weapons associated to dead
Social Media UKR 2014 : focus on “BTR”
Social Media UKR 2014: focus on “BTR” in May 2014
Social Media UKR 2014 : focus on “BTR” May 2014, 7th
Social Media UKR 2014 : ready for intelligence report !

<table>
<thead>
<tr>
<th>Contenu du tweet</th>
<th>Date du tweet</th>
<th>Heure du tweet</th>
<th>Utilisateur</th>
<th>Nombre de followers</th>
<th>Nombre de retweets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Когда купил 42 новых БТР для нужд карательной операции в Славянске <a href="http://t.co/kYWhk7No">http://t.co/kYWhk7No</a></td>
<td>07/05/2014</td>
<td>17:10:21</td>
<td>km_ru</td>
<td>1124</td>
<td>0,00</td>
</tr>
</tbody>
</table>

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Impression PDF
Social Media UKR 2014 : Casualties

Nombre de tweets et nombres de victimes moyen

Nombre de victimes sur le temps

Fréquence de ETAT VICTIMES et ARMES

04/04/2014
03/05/2014
31/05/2014
Social Media UKR 2014: Casualties focus
Social Media UKR 2014: Focus on specific operating mode (VBIED)
Social Media UKR 2014: Naming the actors, Defining the roles
## Social Media UKR 2014: Building the Networks

### SAS Social Network Analysis

<table>
<thead>
<tr>
<th>Risque Global</th>
<th>Utilisateur</th>
<th>Topic discussed in tweets</th>
<th>Nombre de Retweets</th>
<th>Nombre de Tweets</th>
<th>Number of times mentioned in a tweets</th>
<th>Noeuds Du Reseau</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>DonTigr</td>
<td>FORCES_SEPARRATURCES, FORCES_RUSSES</td>
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Social Media UKR 2014: Selecting category "weapons"
Social Media UKR 2014: Selecting category “weapons”, account focus

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Social Media UKR 2014: Selecting category “weapons”, account inspection
Social Media UKR 2014 : Account Network
The topic #LIFE_WILL_WILL_UKRAINE is used in 33 tweets.
The topic MEDIA_MEDIA_UKRAINE is used in 18 tweets.
Social Media UKR 2014 : Network analysis

rusborder register on 21 JAN 2009 is a NON VERIFIED account and indicated as language ru
Social Media UKR 2014: Orientation by Technical data analysis ARTEM_K.

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<th>RISQUE GLOBAL</th>
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Social Media UKR 2014: ARTEM_K. account investigation
Social Media UKR 2014: ARTEM_K. account investigation
CHRONO GEO REFERENCED EVENTS (CGR)
Positive identification of persons of interest through profiles

Activities location and time tracking

Searches for inconsistencies both in statements and technical documents
A **chrono-geo referenced** event (CGR) is an event that associates the user of a vector, at a place, at a given instant (DTG).

Each vector (cell phone, car, email, banking transactions,...) match with a user profile.

The cumulative of the **CGRs** allows to follow an individual in time and space through its various user profiles.

**CGRs** are spread out in the data provided by the various operators who record every minutes events of the vectors for which they are responsible (airlines, banks, security forces, remote monitoring operators, ISPs ...)

**CGRs** derived from declarative information as in the witness hearing or custodial investigation report may be taken in account and integrated.

By cross-checking it becomes possible to identify the individual behind the different profiles user and to rebuild his activity.

80% **OF AN INDIVIDUAL’S DAILY ACTIVITY CAN BE CHRONO-GEO-REFERENCED**
By tracking wire payment or any other kind of transaction

Following your car by tracking it or through third party accounts

Accounts from people happening to follow you

Intercepting emails or breaking in social media accounts

Video surveillance and other kinds of video tracking

Wiretapping phone calls or studying metadata

Chrono Geo Referenced Events

POSSIBILITIES
CGR CROSS CHECKING
CHRONO GEO REFERENCED

EXTRACTION AND INCOHERENCIES SEARCHES
Conclusions

- **Social media intelligence** is about how to use individuals as sensors to collect the data.

- **Behavior** is key in the detection of new trends (radialization, crisis, emergency, etc).

- **Text analysis** is applicable to any possible case.

- **Topics** are **discovered** automatically.

- **Arithmetic operations** are possible form Texte extractions.

- **Network build and analysis** are essential to understand a situation and define the **role** of actors.

- **Geolocation** is not obvious.
Next steps:

- DETECTION platform operated by OAK Branch to support a Fr MoD funded operational research program to deal with arab dialects
- SAS partnered with OAK Branch for MASP (corp.)
- Interpol, Europol, UK services, Fr services requested a follow-up after this presentation

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& AP
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