

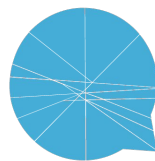


LOD Navigator

Tracing Movements of Italian Shoah Victims

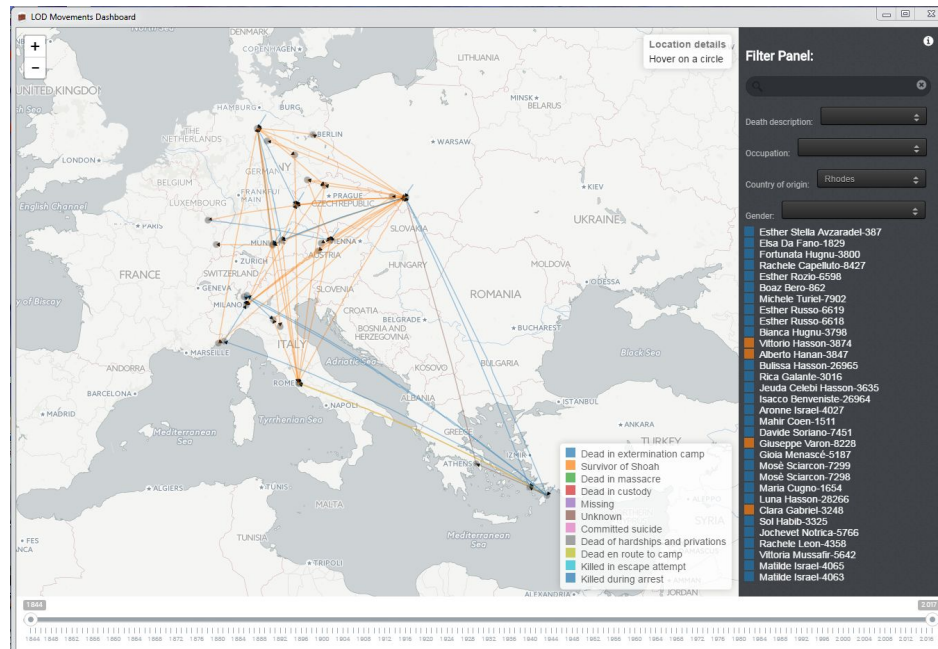
Rachele Sprugnoli, Giovanni Moretti, Sara Tonelli

Digital Humanities Research Group
Fondazione Bruno Kessler (Trento, Italy)



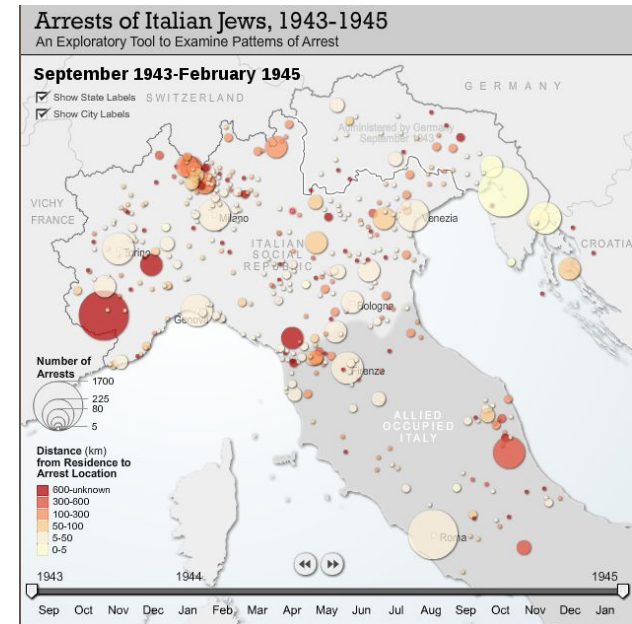
WHAT

- Standalone tool that tracks the movements of Italian victims of Shoah through an interactive visualization
- Movement = trajectory from one georeferenced place where a dated event took place to another
- Based on Linked Open Data (*thanks to Laura Brazzo and Silvia Mazzini!*)
- Freely available: <http://dh.fbk.eu/technologies/lod-navigator>



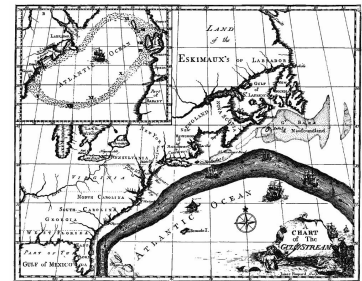
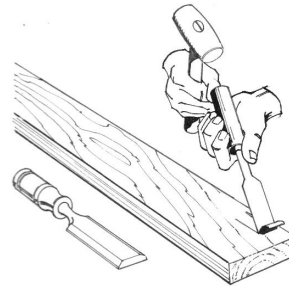
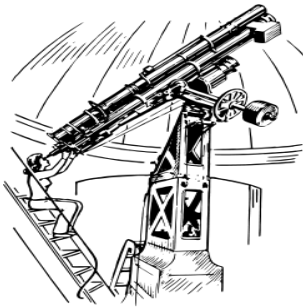
WHY

- Holocaust was “a profoundly geographical phenomenon” (Knowles et al., 2014)
- Visualizations can help:
 - generating new questions and new knowledge about Nazis’ genocidal policies
 - reconstructing stories of groups of victims and individuals



HOW

- Four steps:
 1. Data observation
 2. Data extraction
 3. Data integration & manipulation
 4. Data visualization





1) DATA OBSERVATION

■ CDEC Digital Library and LODview

The screenshot displays the CDEC Digital Library interface. The main content area shows a hierarchical view of data for Primo Levi. The top level is 'Levi, Primo' (http://dati.cdec.it/od/shoah/person/5002), which is an entity of type 'Person'. Below this, a specific event is highlighted: 'persecution of Levi, Primo 31/7/1919 Torino' (http://dati.cdec.it/od/shoah/persecution/5002), an entity of type 'Persecution'.

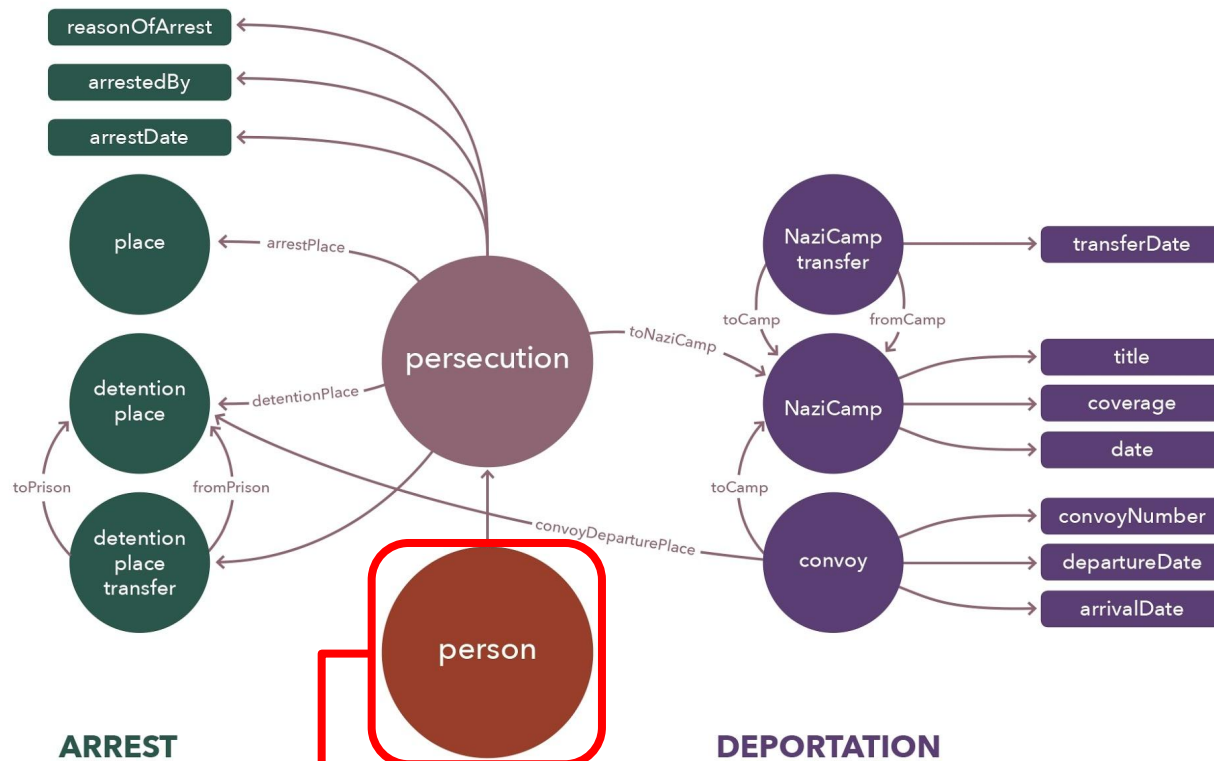
The left sidebar contains navigation links: HOME, FOT, 39 RDF, 5, INFORMAZIONI BI, PROFESSIONE, and PERSECUZIONE. The main content area displays a table of properties and values for the selected entity.

Property	Value
rdfs:label	persecution of Levi, Primo 31/7/1919 Torino
shoah:convoyNumber	8
shoah:departureDate	22/02/1944
shoah:arrivalDate	26/02/1944
shoah:campSerialNumber	174517
shoah:persecutionCategory	ebreo
dc:abstract	EN IT Primo Levi, figlio di Cesare Levi e Ester Luzzati è nato in Italia a Torino il 31 luglio 1919. Arrestato a Brusson (Aosta). Deportato nel campo di sterminio di Auschwitz. È sopravvissuto alla Shoah.
shoah:arrestedBy	italiani
shoah:arrestDate	13/12/1943
rdfs:type	shoah:Persecution ↳ Persecution



1) DATA OBSERVATION

■ Shoah Ontology + Biographical Ontology





2) DATA EXTRACTION

- From SPARQL query (<http://dati.cdec.it/>) to CSV

Virtuoso SPARQL Query Editor

	A	B	C	D	E	F	G	
1	ID	name	gender	date_of_birth	place_of_birth	date_of_death	place_of_death	massacreDate
554	http://dati.cdec.it/lod/shoah/person/5894	Ninos, Luisa	F	19050830	Smirne			
555	http://dati.cdec.it/lod/shoah/person/5894	Ninos, Luisa	F	19050830	Smirne			
556	http://dati.cdec.it/lod/shoah/person/5002	Levi, Primo	M	19190731	Torino	19870411	Torino	
557	http://dati.cdec.it/lod/shoah/person/2363	Di Gioacchino, Anna	F	19110120	Ancona	19480413	Gerusalemme	
558	http://dati.cdec.it/lod/shoah/person/2363	Di Gioacchino, Anna	F	19110120	Ancona	19480413	Gerusalemme	
559	http://dati.cdec.it/lod/shoah/person/2363	Di Gioacchino, Anna	F	19110120	Ancona	19480413	Gerusalemme	
560	http://dati.cdec.it/lod/shoah/person/1818	Coné, Giuseppe	M	19100207	Rodi			
561	http://dati.cdec.it/lod/shoah/person/1818	Coné, Giuseppe	M	19100207	Rodi			
562	http://dati.cdec.it/lod/shoah/person/1818	Coné, Giuseppe	M	19100207	Rodi			
563	http://dati.cdec.it/lod/shoah/person/658	Arbisse, Raimondo	M	19190219	Minsk			
564	http://dati.cdec.it/lod/shoah/person/4980	Levi, Felicia	F	19230313	Rodi			
565	http://dati.cdec.it/lod/shoah/person/4980	Levi, Felicia	F	19230313	Rodi			
566	http://dati.cdec.it/lod/shoah/person/4980	Levi, Felicia	F	19230313	Rodi			
567	http://dati.cdec.it/lod/shoah/person/5014	Levi, Vittoria	F	19200110	Rodi			
568	http://dati.cdec.it/lod/shoah/person/5014	Levi, Vittoria	F	19200110	Rodi			
569	http://dati.cdec.it/lod/shoah/person/3281	Goldstein, Bronia Beatrice	F	19080215	Il Cairo			
570	http://dati.cdec.it/lod/shoah/person/5895	Nissim, Luciana	F	19191020	Torino	19981201	Milano	
571	http://dati.cdec.it/lod/shoah/person/5895	Nissim, Luciana	F	19191020	Torino	19981201	Milano	
572	http://dati.cdec.it/lod/shoah/person/1820	Cordoval, Eliakim	M	19190115	Rodi			
573	http://dati.cdec.it/lod/shoah/person/1820	Cordoval, Eliakim	M	19190115	Rodi			
574	http://dati.cdec.it/lod/shoah/person/1820	Cordoval, Eliakim	M	19190115	Rodi			
575	http://dati.cdec.it/lod/shoah/person/213	Alhadeff, Samuele	M	19070407	Rodi	19450410		
576	http://dati.cdec.it/lod/shoah/person/850	Berger, Giuseppe	M	19210215	Zaluzice	19450302		
577	http://dati.cdec.it/lod/shoah/person/714	Bassani, Bruno	M	19121230	Bologna	19450126		
578	http://dati.cdec.it/lod/shoah/person/714	Bassani, Bruno	M	19121230	Bologna	19450126		

(The result can only be sent back to browser, not saved on the server, see [details](#))

Run Query

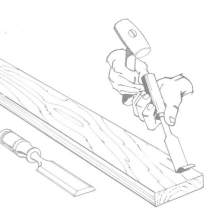
Reset



2) DATA EXTRACTION

- Information extracted for 9,042 persons

- | | |
|---------------------------------|---------------------------|
| 1. ID | 14. shoahSurvivor |
| 2. name | 15. arrestDate |
| 3. gender | 16. arrestPlace |
| 4. date_of_birth | 17. departureDate |
| 5. place_of_birth | 18. convoyDeparturePlace |
| 6. date_of_death | 19. convoyNumber |
| 7. place_of_death | 20. convoyArrivalDate |
| 8. massacreDate | 21. arrivalDate |
| 9. massacrePlace | 22. toNaziCamp |
| 10. deathDescriptionIntegration | 23. naziCampTransfertDate |
| 11. position | 24. toNaziCampTranfert |
| 12. abstract | 25. liberationReturnDate |
| 13. deathDescription | 26. liberationReturnPlace |



3) DATA INTEGRATION & MANIPULATION

- Cleaning of inconsistent date formats

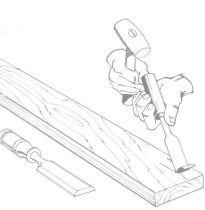
date_of_birth	arrivalDate	naziCampTransfertDate
19250315	?	00/12/1944
1900	19440816	1945.04
19220501	19440816	18/01/1945
0	?	1944.02.26
18830807	16/06/1944	?
19270806	?	02/02/1945
19448	7 marzo 1945	1944.10. 27
1917	00/00/1944	?*

14 formats having at least the year

8 formats with no temporal information

↓
YYYY-MM-DD

↓
no date = no movement



3) DATA INTEGRATION & MANIPULATION

- Classification of occupations
 - from 168 positions to 27 (+ *unknown*) by using Wikipedia categories

e.g.
CALZETTAIA/female hosier
CALZETTAIO/male hosier
CALZOLAIO/cobbler
↓
Craft occupations

Category:Occupations by type

From Wikipedia, the free encyclopedia

Subcategories

This category has the following 36 subcategories, out of 36 total.

*

▶ Indian castes by profession (18 C)

A

- ▶ Agricultural occupations (5 C, 3 P)
- ▶ Arts occupations (11 C, 34 P)

C

- ▶ Ceremonial occupations (10 P)
- ▶ Cleaning and maintenance occupations (2 C, 30 P)
- ▶ Computer occupations (4 C, 45 P)
- ▶ Construction and extraction occupations (4 C, 16 P)
- ▶ Consulting occupations (1 C, 32 P)

D

- ▶ Design occupations (5 C, 11 P)

E

- ▶ Economic occupations (3 C, 5 P)
- ▶ Education and training occupations (6 C, 77 P)
- ▶ Engineering occupations (6 C, 27 P)
- ▶ Entertainment occupations (17 C, 70 P)

F

- ▶ Fashion occupations (6 C, 27 P)

G

- ▶ Gendered occupations (10 C, 62 P)
- ▶ Government occupations (10 C, 112 P)

H

- ▶ Healthcare occupations (26 C, 157 P)
- ▶ Hospitality occupations (2 C, 16 P)
- ▶ Humanities occupations (2 C, 10 P)

I

- ▶ Illegal occupations (11 C, 34 P)
- ▶ Industrial occupations (8 C, 19 P)

J

- ▶ Journalism occupations (3 C, 27 P)

L

- ▶ Legal professions (13 C, 183 P)

M

- ▶ Maritime occupations
- ▶ Marketing occupations
- ▶ Media occupations
- ▶ Military specialism

O

- ▶ Ombudsmen by type

P

- ▶ Political occupations
- ▶ Product testers (2)
- ▶ Production occupations

R

- ▶ Religious occupations

S

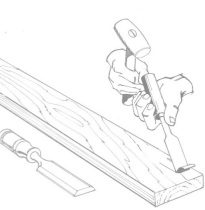
- ▶ Science occupations
- ▶ Service occupations
- ▶ Sports occupations

T

- ▶ Transport occupations



WIKIPEDIA
The Free Encyclopedia



3) DATA INTEGRATION & MANIPULATION

- Integration of missing death places
 - 312 places automatically extracted from the *deathDescriptionIntegration* field

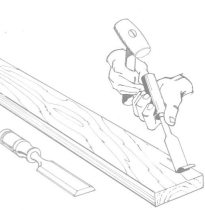
deathDescriptionIntegration
Ucciso in tentativo di fuga a Milano
Morta per disagi e privazioni a Firenze
Morto in stato di detenzione nel campo di Fossoli, Modena
Ucciso in stato di detenzione in carcere a Venezia
Morto suicida a Castiglione dei Pepoli, Bologna
Morto in stato di detenzione nel campo di Fossoli, Modena
Morta in italia
Morta per disagi e privazioni a Firenze
Morto per disagi e privazioni a Genova
Morto nell'eccidio di Cuneo



Ucciso in tentativo di fuga a **Milano**
Morta per disagi e privazioni a **Firenze**
Morto in stato di detenzione nel campo di **Fossoli**, **Modena**
Ucciso in stato di detenzione in carcere a **Venezia**
Morto suicida a **Castiglione del Pepoli**, **Bologna**
Morto in stato di detenzione nel campo di **Fossoli**, **Modena**
Morta in **Italia**
Morta per disagi e privazioni a **Firenze**
Morto per disagi e privazioni a **Genova**
Morto nell'eccidio di **Cuneo**

Top concepts:

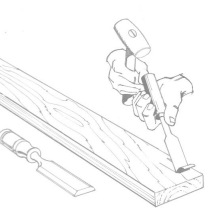
Administrative Region	Bologna	
Administrative Region	Firenze	
Administrative Region	Modena	
Administrative Region	Milano	
Administrative Region	Genova	



3) DATA INTEGRATION & MANIPULATION

- Adding of country of origin
 - extracted from the *abstract* field
 - Italy plus other 36 countries covering 49% of the victims (plus *unknown*)

abstract
Elena Recanati, daughter of Luigi Recanati and Luigia Simon. She was born in Italy , in Turin, on March 12 1922. She was married with Guido Foa. She was arrested in Canischio (Turin). She was deported to the extermination camp of Auschwitz. She survived the Shoah.
Regina Assael, daughter of Menahem Assael and Emilia Politi. She was born in Turkey , in Izmir, on June 14 1872. She was the widow of Isaac Ventura. She was arrested in Milan (Milan). She was deported to Bergen Belsen. She survived the Shoah.
Erich Hirschl, son of Hinko Hirschl and Giulia Hirsch. He was born in Yugoslavia in Zagreb, on March 21 1921. He was married with Zora Adler. He was arrested in Milan (Milan). He was deported to the extermination camp of Auschwitz. He did not survive the Shoah.



3) DATA INTEGRATION & MANIPULATION

- Georeferencing of place names with Nominatim
 - 1493 unique places / 15% manually corrected or georeferenced: E.g.: Siena
- Gross-Meseritz → Groß Meseritsch
Choumbla → Bulgaria

place_of_birth
Rodi
Sarajevo
Roma
Torino
Fiume
Smirne
Trieste
Homs

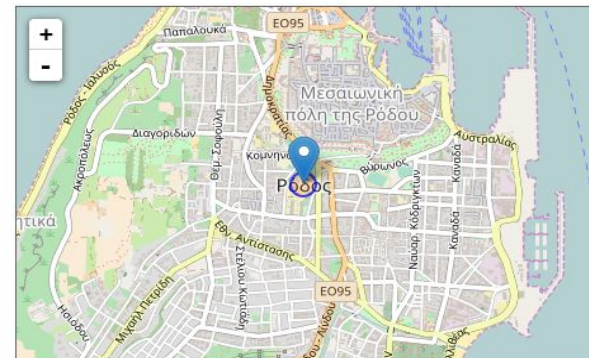
 Nominatim

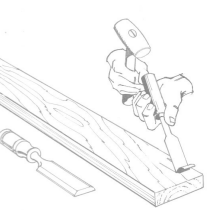
Rhodes

Name	Rodos (int_name) Ρόδος (name) Rhodos (name:cs) Rhodos (name:de) Ρόδος (name:el) Rhodes (name:en) Rodas (name:es) Rodos (name:fi) Rhodes (name:fr) Rodosz (name:hu) Rodi (name:it) Rodos (name:pl) Rodos (name:ro) Ρόδος (name:ru) Rodos (name:sk) Ρόδος (name:sr) Rodos (name:sr-Latn) Rhodos (name:sv) Rodi (old_name)
Type	place:city
Last Updated	2017-06-04 21:21
Admin Level	15
Rank	City
Importance	0.35 (estimated)
Coverage	Point
Centre Point	36.4379874,28.2233083

Data last updated:
2017/06/21 12:04 GMT

About & Help ▾





3) DATA INTEGRATION & MANIPULATION

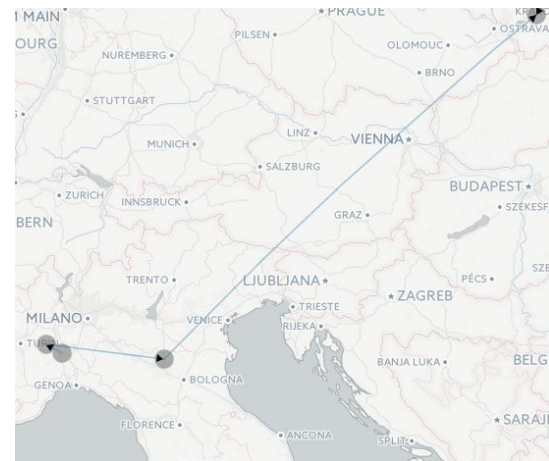
- Conversion of all data in a JSON format

```
{
  "name": "Primo_Levi-5002",
  "nation": "Italy",
  "continent": "EUROPE",
  "sex": "M",
  "work": "Mixed",
  "URI": "http://dati.cdec.it/lod/shoah/person/5002",
  "type": "Survivor of Shoah",
  "movements": [
    {
      "date": 19190731,
      "place": "Torino",
      "latitude": 45.0709201,
      "longitude": 7.685972,
      "predicate_id": "Unknown",
      "predicate": "Unknown",
      "resource": "CDEC Data",
      "resource_frame": "Birth",
      "place_frame": "Unknown",
      "snippet": "Born in Torino in/on July 31, 1919"
    },
    {
      "date": 19431213,
      "place": "Brusson",
      "latitude": 45.759342,
      "longitude": 7.7304474,
      "predicate_id": "Unknown",
      "predicate": "Unknown",
      "resource": "CDEC Data",
      "resource_frame": "Arrest",
      "place_frame": "Unknown",
      "snippet": "Arrested in Brusson in/on December 13, 1943"
    }
  ],
}
```



4) DATA VISUALIZATION

- Interactive interface
 - Search by name or place (with auto-complete function)
 - Timeline
 - Filters: *country of origin / occupation / death description / gender*
 - Fly-over functionality
 - Link to CDEC digital library



SOME NUMBERS

- What is visualized in the LOD Navigator
 - 8,963 persons with at least 1 movement
 - 18,813 movements between 37,626 non-unique places

PLACE OF	#
Birth	8537
Arrest	7991
Nazi Camp	7905
Detention	7873
Death	4359
Nazi Camp Transfer	825
Return after Liberation	136

DEMO

CONCLUSIONS

- Tool for digital history
- Freely available
- Reuse of a LOD dataset
- Focus on the spatiality of the Holocaust
- Identification of spatiotemporal patterns but also representation of individual experiences

POSSIBLE FUTURE DEVELOPMENTS

- From standalone application to web application
- New filters
- Trace movements of families
- Visually deal with uncertainty
- Extend input data with similar information available in other databases





THANK YOU!

Email: {sprugnoli,moretti,satonelli}@fbk.eu

Web Site: <http://dh.fbk.eu>

Twitter: https://twitter.com/DH_FBK