



# Explorative Suche und intelligente Empfehlungssysteme

Prof. Dr. Harald Sack  
FIZ Karlsruhe & AIFB, KIT Karlsruhe

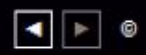
bing™



EXPLORE

- Images
- Videos
- Shopping
- News
- Maps
- Travel

Web Search today...



About 21.700.000 results (0,78 seconds)

Neil Armstrong - Wikipedia

[https://en.wikipedia.org/wiki/Neil\\_Armstrong](https://en.wikipedia.org/wiki/Neil_Armstrong)

Neil Alden Armstrong (August 5, 1930 – August 25, 2012) was an American astronaut and the first person to walk on the Moon. He was also an aerospace ...

DJ Neil Armstrong (@djneilarmstrong) · Twitter

<https://twitter.com/djneilarmstrong>

Does #theweeknd remind ya of the king of pop? Here's a remix that may make ya think so [soundcloud.com/neil-arm...](https://soundcloud.com/neil-arm...) Feel... [pic.twitter.com/UW8JRgu...](https://pic.twitter.com/UW8JRgu...)

11 hours ago · Twitter

My new sounds: MJ X The Weeknd Remix [soundcloud.com/neil-arm...](https://soundcloud.com/neil-arm...) on #SoundCloud

11 hours ago · Twitter

@okayplayer - If you think the weeknd sounds like #MJ, this might prove your point - [djneilarmstrong.com/mjx...](https://djneilarmstrong.com/mjx...)

15 hours ago · Twitter

Biography of Neil Armstrong | NASA

[www.nasa-usa.de/centers/glenn/about/bios/neilbio.html](http://www.nasa-usa.de/centers/glenn/about/bios/neilbio.html)

National Aeronautics and Space Administration John F. Glenn Research Center Lewis Field Cleveland, Ohio 44135. Neil A. Armstrong, the first man to walk on ...

Top stories

Neil Armstrong's "One small step for man" might be a misquote

Quartz · 15 hours ago

→ More for neil armstrong

Who Was Neil Armstrong? | NASA

[www.nasa-usa.de/audience/forstudents/k-4/stories/.../who-was-neil-armstrong-k4.html](http://www.nasa-usa.de/audience/forstudents/k-4/stories/.../who-was-neil-armstrong-k4.html)

Neil Armstrong was the first person to walk on the moon. ... He flew on two space missions. ... What Did Neil Armstrong Do Before He Became an Astronaut?

Neil Armstrong - Astronaut, Explorer, Pilot - Biography.com

[www.biography.com/people/neil-armstrong-9188943](http://www.biography.com/people/neil-armstrong-9188943)

Aug 8, 2016 - Astronaut, military pilot, and educator, Neil Armstrong made history on July 20, 1969, by becoming the first man to walk on the moon. ... Neil Armstrong was born in Wapakoneta, Ohio, on

Search Engine Index

- Web pages
- News articles
- Tweets
- Videos
- Images
- ...

Knowledge Graph

- Facts (structured data)
- Google KG:
  - $70 \times 10^9$  facts
  - $10^9$  entities (03/2017)



Neil Armstrong

Astronaut

Neil Alden Armstrong was an American astronaut and the first person to walk on the Moon. He was also an aerospace engineer, naval aviator, test pilot, and university professor. [Wikipedia](#)

**Born:** August 5, 1930, Wapakoneta, Ohio, United States

**Died:** August 25, 2012, Cincinnati, Ohio, United States

**Space missions:** Apollo 11, Gemini 8

**Spouse:** Carol Held Knight (m. 1994–2012), Janet Shearon (m. 1956–1994)

**Siblings:** Dean Armstrong, June Armstrong

Quotes

View 7+ more

*That's one small step for man, one giant leap for mankind.*

*Mystery creates wonder and wonder is the basis of man's desire to understand.*

*I believe that every human has a finite number of heartbeats. I don't intend to waste any of mine running around doing exercises.*

People also search for

View 15+ more



Buzz Aldrin



Michael Collins



John Glenn



Yuri Gagarin



Alan Shepard

who was the first man on the moon



# Question Answering

All Images Shopping Videos News More Settings Tools

About 167,000,000 results (0,71 seconds)

## Neil Armstrong

**Apollo 11's** mission was to land two men on the moon. They also had to come back to Earth safely. **Apollo 11** blasted off on July 16, 1969. **Neil Armstrong, Edwin "Buzz" Aldrin** and **Michael Collins** were the astronauts on **Apollo 11**. Jan 16, 2008



### NASA - The First Person on the Moon

<https://www.nasa.gov/audience/forstudents/k-4/stories/first-person-on-moon.html>

About this result Feedback

### People also ask

Who was the first man to touch the moon?

Who have walked on the moon?

Who was supposed to be the first man to step on the moon?

Who was the first to reach the moon?

Feedback

### NASA - The First Person on the Moon

<https://www.nasa.gov/audience/forstudents/k-4/stories/first-person-on-moon.html>

by H Deiss - 2008

Jan 16, 2008 - **Apollo 11's** mission was to land two men on the moon. They also had to come back to Earth safely. **Apollo 11** blasted off on July 16, 1969. **Neil Armstrong, Edwin "Buzz" Aldrin** and **Michael Collins** were the astronauts on **Apollo 11**.

## Apollo 11

Space mission



Apollo 11 was the spaceflight that landed the first two humans on the Moon. Mission commander Neil Armstrong and pilot Buzz Aldrin, both American, landed the lunar module Eagle on July 20, 1969, at 20:18 UTC. [Wikipedia](#)

**Launch date:** July 16, 1969, 6:32 AM GMT-7

**Dates:** Jul 16, 1969 – Jul 24, 1969

**Crew size:** 3

**Reference system:** Lunar orbit

**Members:** Neil Armstrong, Michael Collins, Buzz Aldrin

**Manufacturers:** Rockwell International (CSM), Grumman (LM)

### People also search for

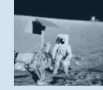
View 15+ more



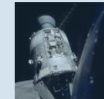
Apollo program



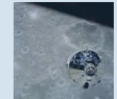
Apollo 13



Apollo 12

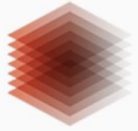


Apollo 17



Apollo 10

Feedback



# TIB AV-PORTAL

SUBJECTS

PUBLISHER

UPLOAD

ABOUT

Neil Armstrong

Search

Online Collection

Offline Collection

Complete Collection

Online collection

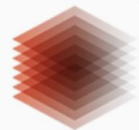


No results found. Please check your spelling or try another term.

Some filters are activated. Try to deactivate filters to retrieve more results. [Deactivate all filters now?](#)

feedback

In archives with **limited number of content** there is always the **probability NOT to find a result**



Neil Armstrong

Search

 Online Collection Offline Collection Complete Collection

Sorry, no results found for **“Neil Armstrong”**, ...

**...but maybe you are interested in:**

- Buzz Aldrin (1 video)
- John Glen (1 video)
- Yuri Gagarin (2 videos)
- Richard Nixon (3 videos)
- Apollo 11 (1 video)
- Astronaut (9 videos)
- Moon (14 videos)
- space exploration (34 videos)
- technology (1.205 videos)

Semantic Similarity  
Relatedness  
Generalisation

...

access to more  
ary catalogues.

# The traditional Information Retrieval Paradigm



Set of Queries



Set of Documents

Query  
Formulation

query

index

Indexing

matches based on **String Similarity**

Saltan, McGill, 1983

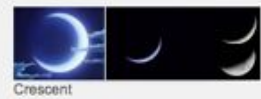
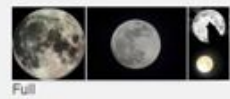
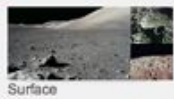
**But, how do you enter a search if you don't know  
the proper name?**



**Describe what you are looking for...**

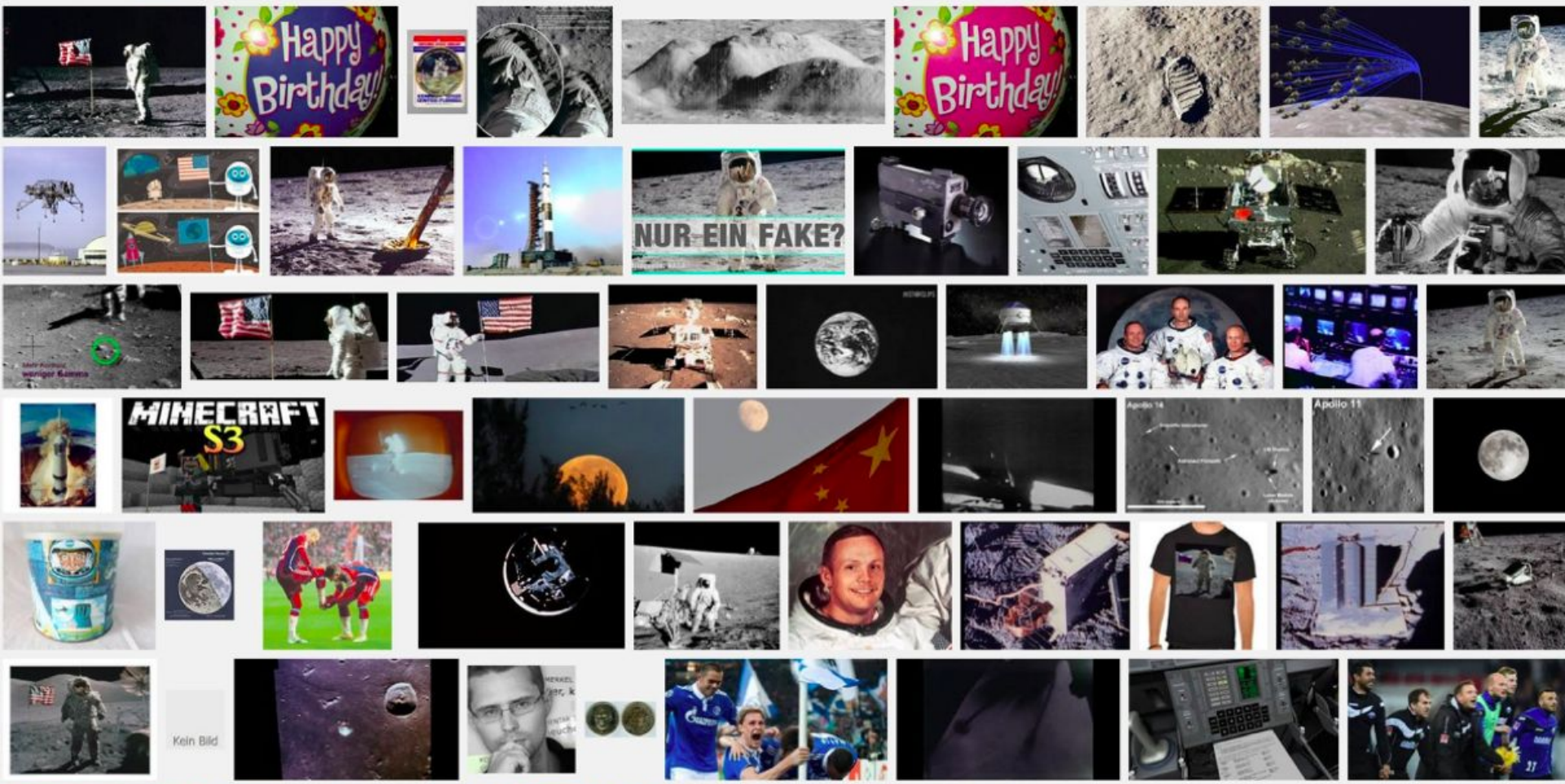


# Moon





# Moon Landing Hit



Mehr Fotos  
weniger Fotos

## MINECRAFT S3

### NUR EIN FAKE?

Kein Bild

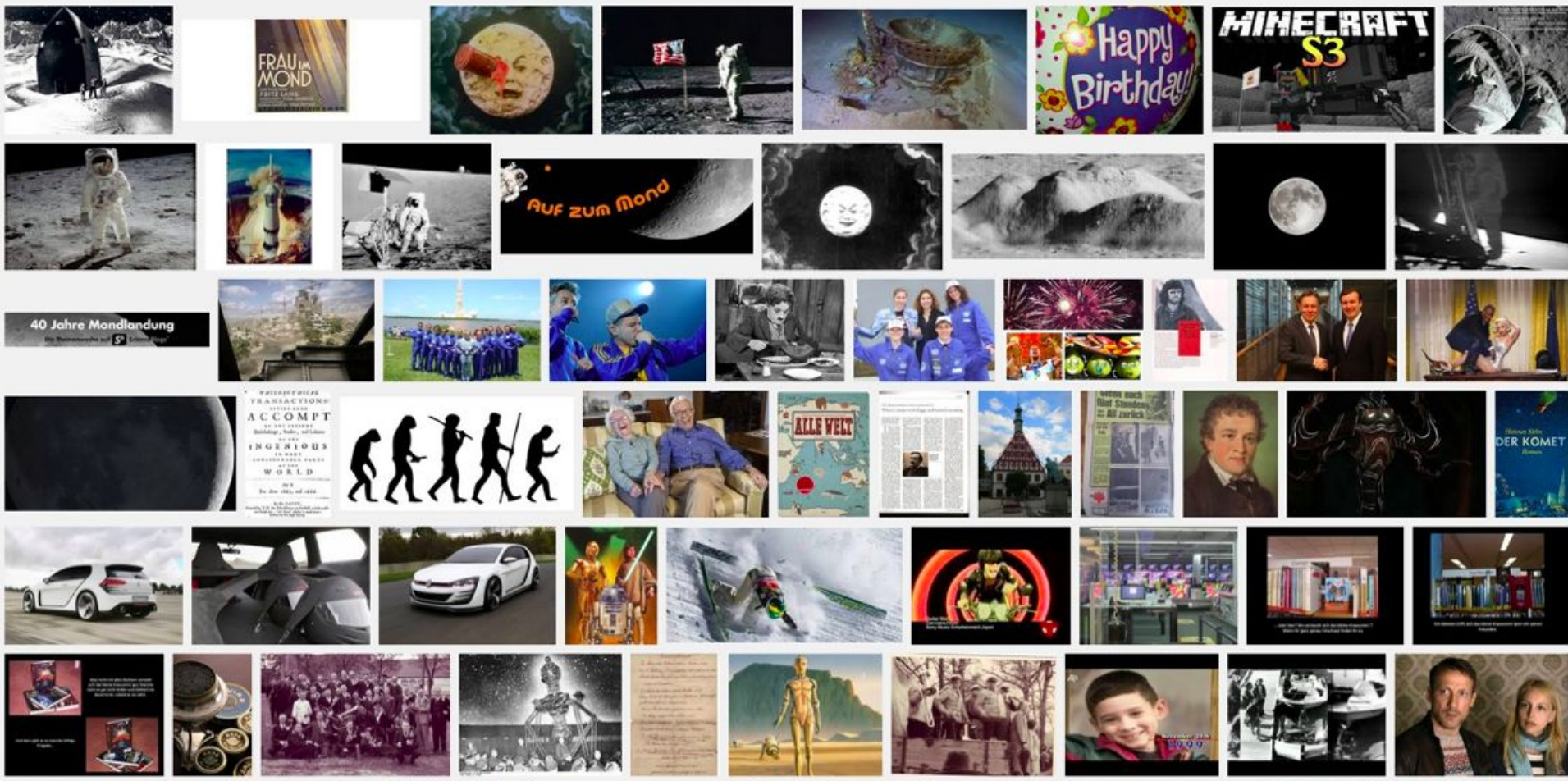




# Moon Landing Hit silent movie

Sign in

SafeSearch





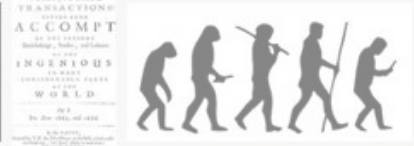
# Moon Landing Hit silent movie

Sign in

SafeSearch



40 Jahre Mondlandung



Melies color Voyage dans la lune Domaine public



# Query by Description



# Serependitious Findings...

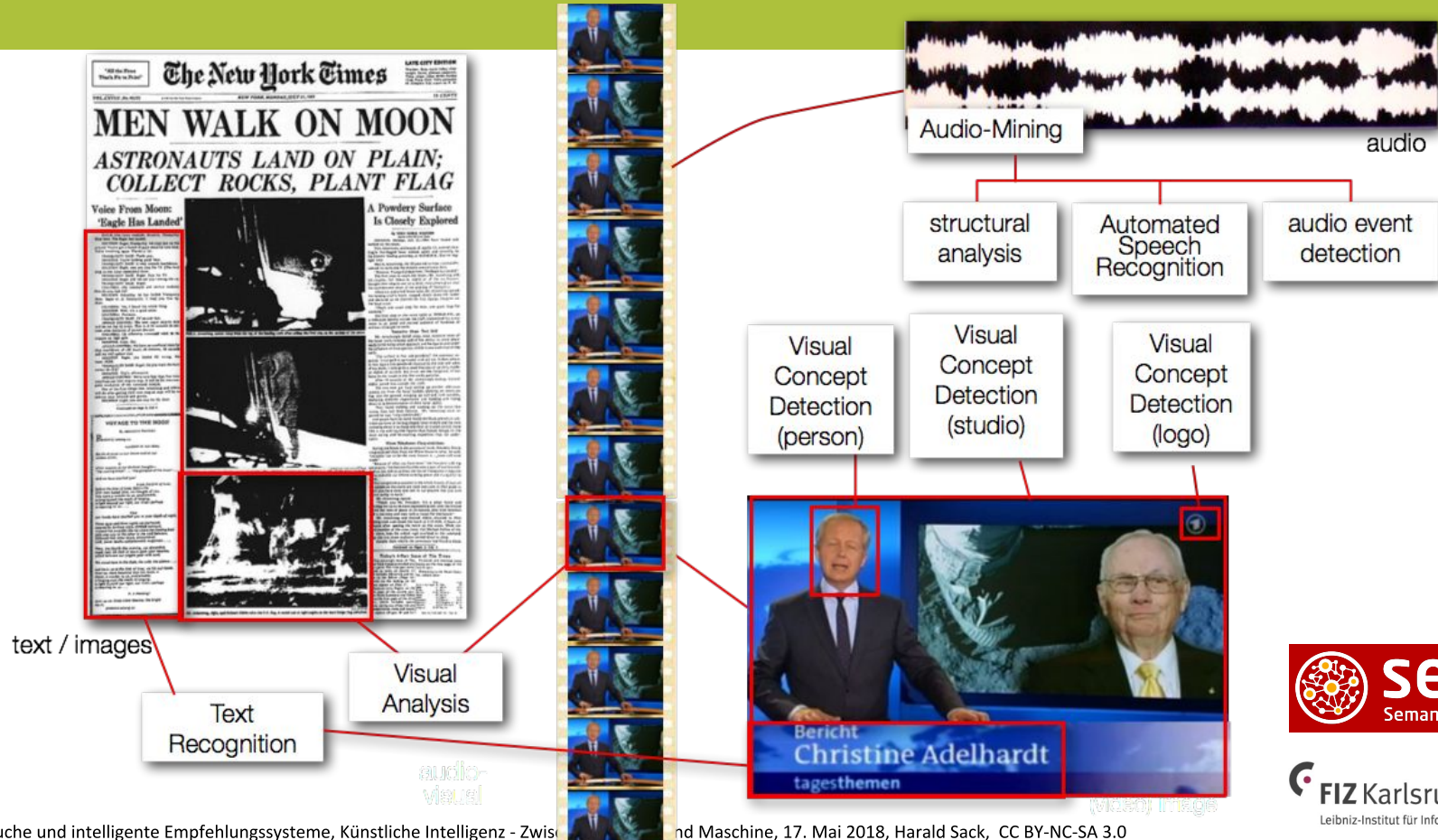




# How to Search a Multimedia Archive?



# (Raw) Multimedia Analysis



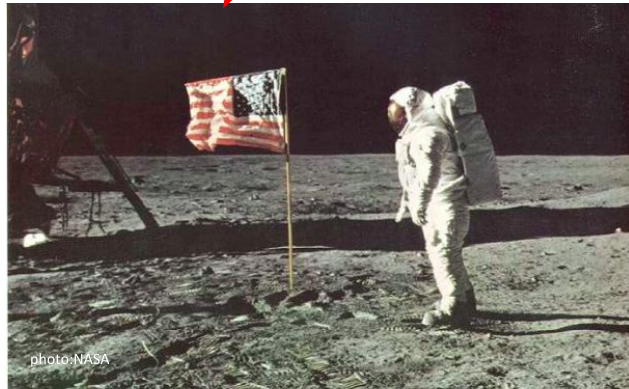
# Multimedia Metadata Annotation



media fragment  
<http://example.com/example.ogv#t=10,20>

media fragment  
<http://example.com/example.ogv#t=20,30>

media fragment  
<http://example.com/example.ogv#t=30,55>



Keyframe  
<http://example.com/example.ogv#t=14.2>

## Metadata example:

**Clip Title:** The First Man on the Moon

**authoritative**

**Clip Description:** An astronaut of the Apollo 11 crew stands besides the US-American flag on the surface of the Moon next to the Apollo lunar dander module

**Media fragment:** <http://example.com/example.ogv#t=10,20>

**automated analysis**

**Key frame:** <http://example.com/example.ogv#t=14.2>

**Speech-to-text:** "Neil Armstrong the 38 year old civilian commander radioes to earth an the mission control room here Houston Tranquility Base here the Eagle has landed."

### Visual Concept Detection:

Person: 0.77  
Outdoor: 0.69  
Landscape: 0.66  
Nightshot: 0.59

**User Tags:** "Neil Armstrong", "Apollo 11", "Moonlanding", "1969"

**non authoritative**

# What is the Meaning of Metadata?

- **Authoritative Metadata**
  - structured data
  - semi-structured data
  - natural language text
- **Non-authoritative Metadata**
  - User Tags (free keywords)
  - User Comments
  - controlled vocabulary
- **Media Analysis Metadata**
  - low level features
  - high level features

**Interpretation**

level of abstraction

reliability

accuracy

context

pragmatics

time & space constraints

**Semantic  
Analysis**

# Linked Open Data based Semantic Analysis

<http://lod-cloud.net/>

## Metadata example:

Cross Domain
Geography
Government
Life Sciences
Linguistics
Media
Publications
Networking
Generated

**Clip Title:** The First Man on the Moon

**Clip Description:** An astronaut of the Apollo 11 crew stands besides the US-American flag on the surface of the Moon next to the Apollo lunar dander module

**Media fragment:** <http://example.com/example.ogv#t=10,20>

**Key frame:** <http://example.com/example.ogv#t=14.2>

**Speech-to-text:** "Neil Armstrong the 38 year old civilian commander radioes to earth an the mission control room here Houston Tranquility Base here the Eagle has landed."

### Visual Concept Detection:

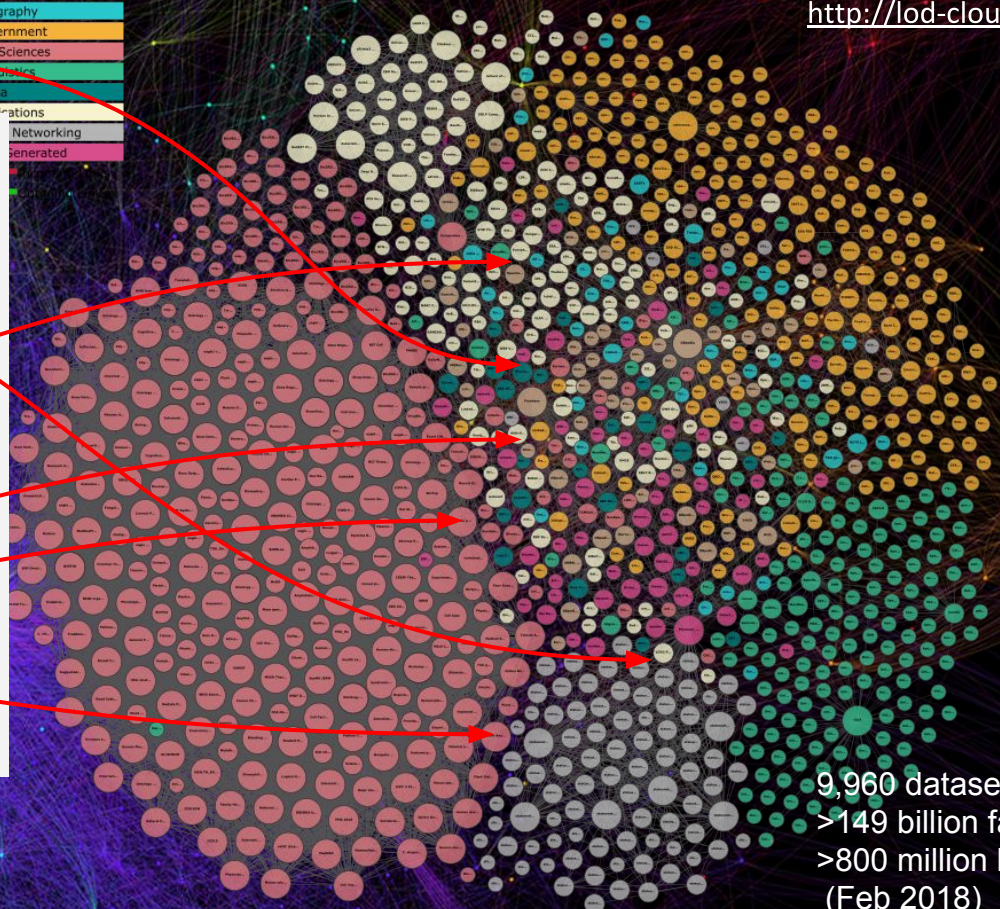
Person: 0.77

Outdoor: 0.69

Landscape: 0.66

Nightshot: 0.59

**User Tags:** "Neil Armstrong", "Apollo 11", "Moonlanding", "1969"



9,960 datasets  
>149 billion facts  
>800 million links  
(Feb 2018)

# Semantic Analysis

"Neil Armstrong" is more than just a character string

text

Neil Armstrong, the 38-year-old civilian commander, radioes to earth an the mission control room here:  
„Houston, Tranquility Base here, The Eagle has landed.“

Named Entity Resolution

dbr:Neil\_Armstrong

dbp:crewMembers

dbr:Apollo\_11

Relations

rdf:type

foaf:name

rdf:type

"Neil Armstrong"@en

dbo:birthDate

dbo:Astronaut

"1930-08-05"^^xsd:date

umbel:SpaceMission

Properties

rdfs:subClassOf

dbp:crewSize

dbo:Person

Class Membership &  
Class Hierarchy

"3"^^xsd:integer

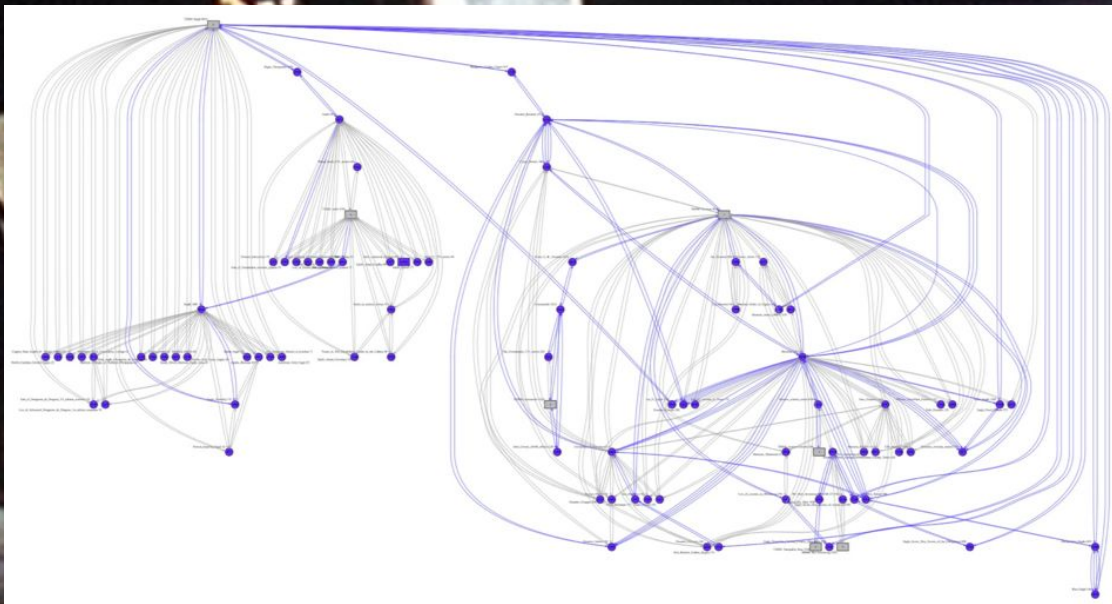


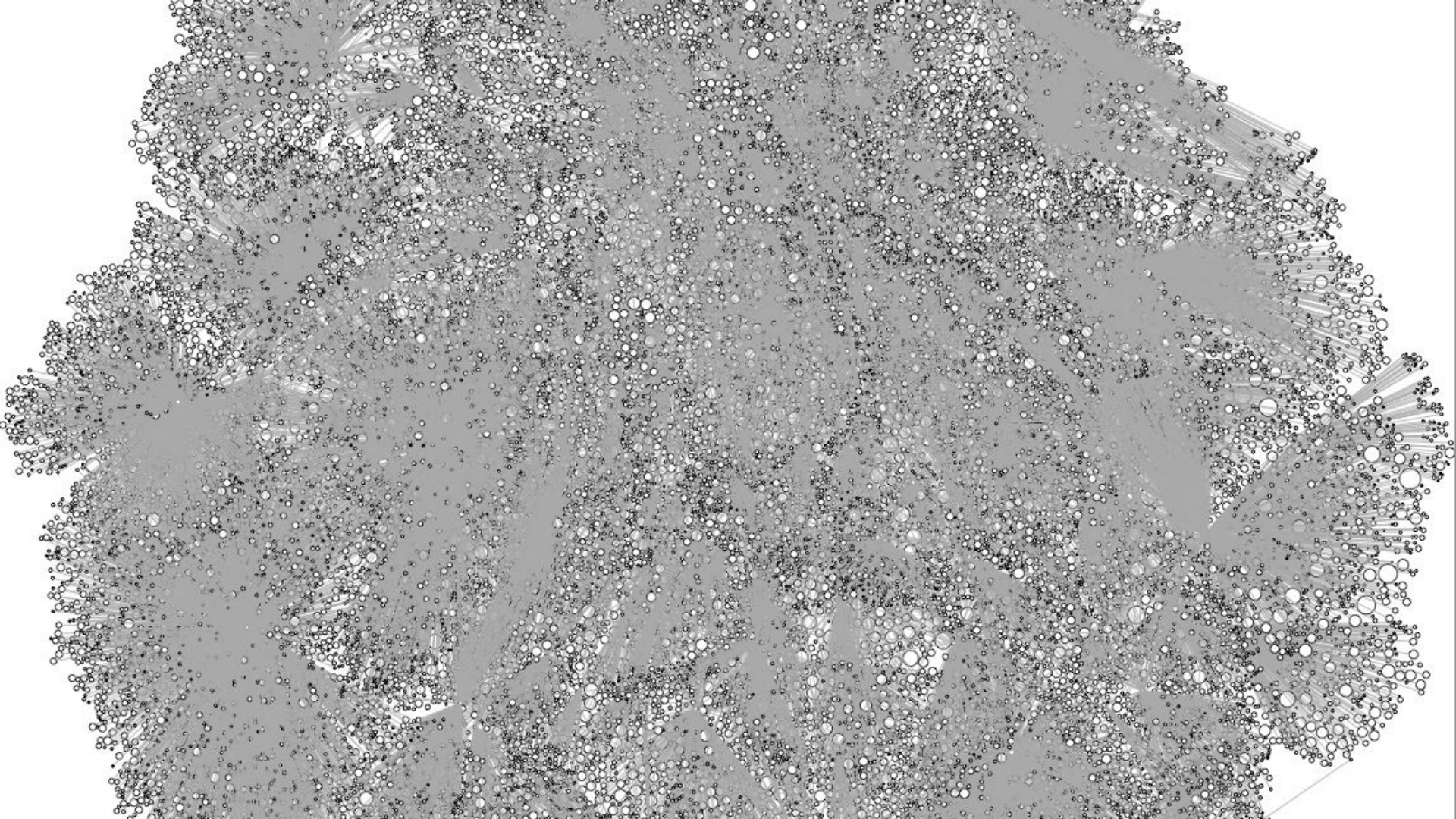
4.58 Mio entities  
580 Mio facts

# Knowledge Graph Based Automated Semantic Annotation

Neil Armstrong, the 38-year-old **civilian commander**, radioes to earth an the **mission control room** here: „**Houston, Tranquility Base** here, **The Eagle** has landed.“

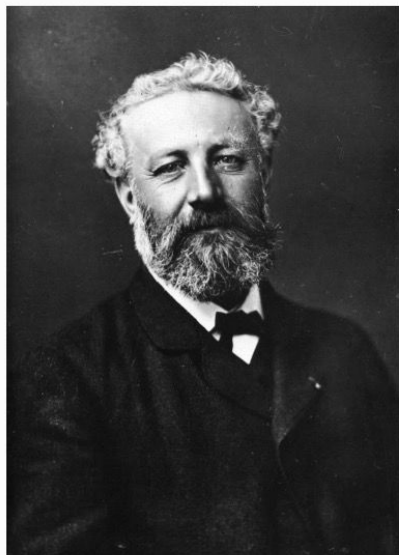
1. Create potential **entity candidates**
2. **Filter** entity candidates by **NER type**
3. Create **induced subgraph** of knowledge graph
4. Determine **connected components**





# Around the World in 80 Days

📁 literature 🕒 30. January 2018 💬 0 👤 Harald Sack ✎ Edit



Jules Verne (1828-1905)

On January 30, 1873, Jules Verne's famous novel 'Around the World in 80 Days' (Le tour du monde en quatre-vingts jours) was published by Pierre-Jules Hetzel in Paris, France. It is one of Jules Verne's most acclaimed stories, where Phileas Fogg of London and his newly employed

## Phileas Fogg

Phileas Fogg is the fictional main protagonist in the 1873 Jules Verne novel Around the World in Eighty Days. Fogg attempts to

**creator** Jules Verne

**nationality** United Kingdom of Great Britain and Ireland



attempts to circumnavigate the globe in 80 days on a 20,000 wager set by his

Englishman like Mr. Fogg with a carpet-bag and a pocket watch. He is expected to travel comfortably under such conditions."

Jules Verne, *In Eighty Days Around the World* (1873), Ch. XX: In Which Fix Comes Face to Face with Phileas Fogg

The English gentleman Phileas Fogg lives at No. 7, Saville Row, Burlington Gardens. He's a rich bachelor, around 40 years of age, but nobody knows the sources of his fortune. Overall, Phileas Fogg always lives a life in clockwork precision and is a passionate whist player. Having dismissed his former valet, for bringing him shaving water at 29°C instead of 30°C, Fogg hires a Frenchman by the name of

## Manual and Semi-automated Semantic Annotation



<http://scih.org/around-the-world-in-80-days/>

e.g. via refer.cx WordPress Plugin

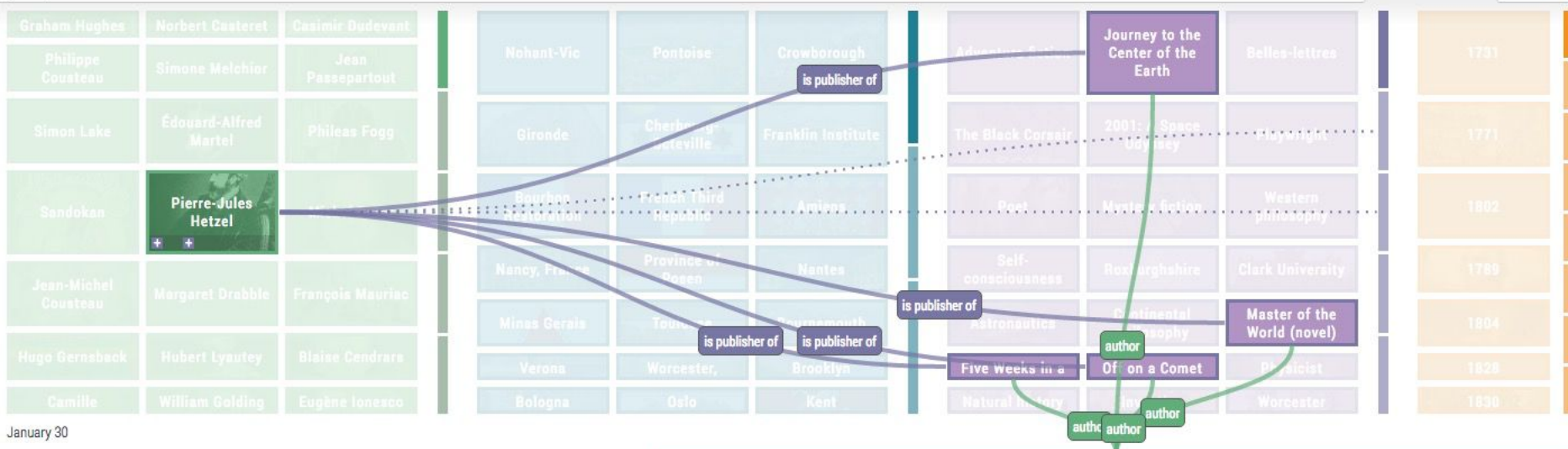




# Information Visualization



Relation Browser Timeline



January 30

## 15 Recommended Articles:

- #1 Hermann Oberth's Dream Of Space Travel
- #2 Simon Lake and the Argonaut
- #3 Adventure Time with Emilio Salgari
- #4 Karl May's Fantastic Adventures
- #5 Alberto Santos-Dumont – the Brazilian Father of Aviation

## Jules Verne



Jules Gabriel Verne (French: [ʒyl vɛʁn]; 8 February 1828 – 24 March 1905) was a French novelist, poet, and playwright best known for his adventure novels and his profound influence on the literary genre of science fiction. Born to bourgeois parents in the seaport of Nantes, Verne was trained to follow in his father's footsteps as a lawyer, but quit the profession early in life to write for magazines and the stage. His collaboration with the publisher Pierre-Jules Hetzel led to the creation of the *Voyages Extraordinaires*, a widely popular series of scrupulously researched adventure novels including *Journey to the Center of the Earth*, *Twenty Thousand Leagues Under the Sea*, and *Around the World in Eighty Days*. Verne is generally considered a major literary

e.g. via refer.cx WordPress Plugin



<http://scih.org/around-the-world-in-80-days/>

# How can Semantic Metadata help to solve our original problem?



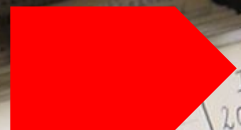
- **Exploratory Search**
- **Intelligent Recommendations**

# Retrieval vs Exploration



34 SCHLAGWORTKATALOG  
BIBLIOGRAPH:N - BIBLIOTHEKEN:DD

40 SCHLAGWORTKATALOG  
BISM - BODEN:E



Bibliotheken:  
Kataloge: Schlagwortkatalog  
(Schleimer, Hans): Der bibliothekarische Schlag-  
wortkatalog. Mit Regeln f. die U.B. in Graz u. eines Anh.  
Systematischer oder alphabetischer Sachkatalog?  
(Leipzig: Harrassowitz 1900)  
Aus: Zentralblatt

I  
206.919

**VERNE, Jules:**  
**From the Earth to the Moon, Direct in**  
**97 Hours 20 Minutes and a Trip Round It,**  
**Sampson Low, Marston & Company,**  
**London (1873),**  
**viii, 323 p. plates.**

GRC C.194.a.659, 12516.g.20

35 SCHLAGWORTKATALOG  
BIBLIOTHEKEN:DE - BIBLIOTHEK:N

SCHLAGWORTKATALOG  
BUT - BUR

SCHLAGWORTKATALOG  
BUCHW - BUE

SCHLAGWORTKATALOG  
BUCH - BUCH

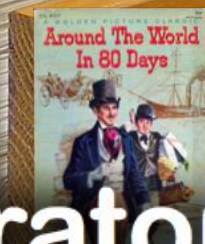
# Retrieval vs Exploration

- Find something „comparable“ that will interest me
- Find documents on the same or related topics
- How did the topic develop over time?
- What else should I read/watch that is of interest for me?  
*... and please don't be boring*



Bibliotheken:  
Kataloge: Schlagwortkataloge  
über bibliografische Systeme  
B.B. in  
Acher

(Schle  
wortkatalo  
Systemati  
(Leipzig  
Aus:Zer



## Exploratory Search



**...and intelligent  
recommendations**

**traditional libraries  
enable exploratory search**

# Exploratory Search based on Linked Data

:A\_Trip\_to\_the\_Moon



**Class Membership & Class Hierarchies**

dbo:runtime

"1080.0"^^dbt:second

**Properties**

foaf:name

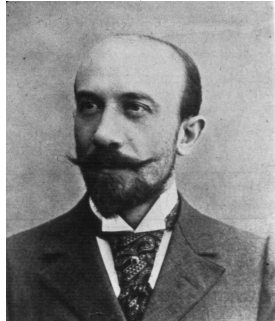
"La voyage dans la Lune"

dbo:director  
dbo:producer  
dbo:writer  
dbo:starring

dbo:starring

dct:subject

- dbc:French\_films
- dbc:French\_science\_fiction\_films
- dbc:Moon\_in\_film
- dbc:Films\_based\_on\_works\_by\_Jules\_Verne
- dbc:Pre-1950\_science\_fiction\_films
- dbc:1902\_films
- dbc:Films\_directed\_by\_Georges\_Méliès
- dbc:1900s\_adventure\_films
- dbc:French\_silent\_short\_films
- dbc:Films\_based\_on\_works\_by\_H.\_G.\_Wells
- dbc:French\_black-and-white\_films



:Georges\_Méliès



:Bleurette\_Bernon

**Relations to other entities**

**Categories**

# Exploratory Search based on Linked Data



:A\_Trip\_to\_the\_Moon



:Georges\_Méliès

dbo:Movie

rdf:type

rdf:type

dbo:director

dbo:director



:A\_Terrible\_Night



:After\_the\_Ball\_(1897\_film)



:The\_Famous\_Box\_Trick

+ 107 more movies

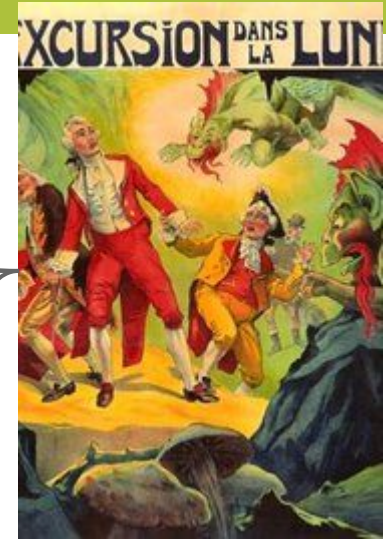


:The\_Astronomer's\_Dream

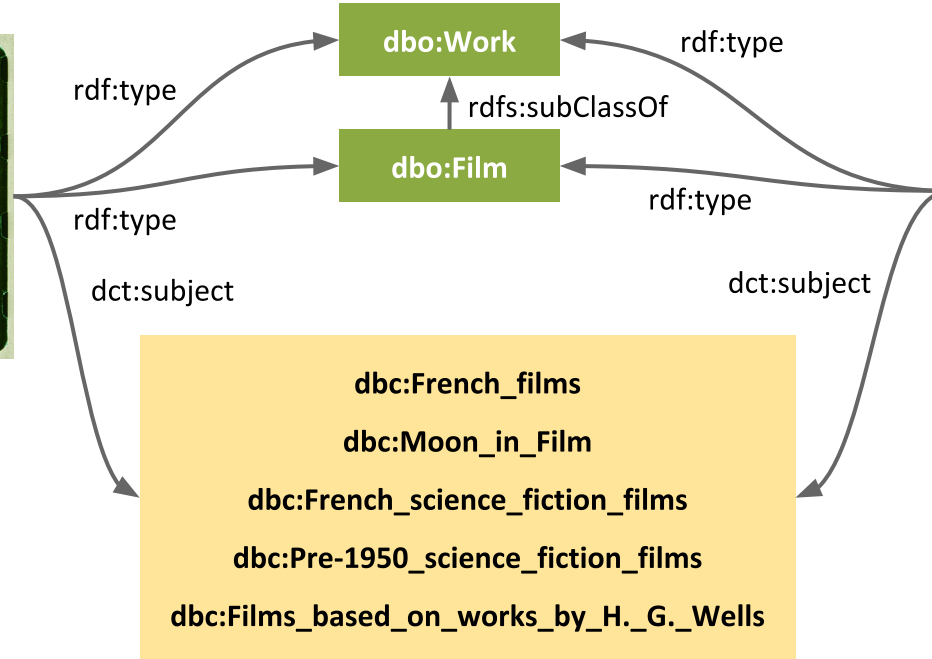
# Exploratory Search based on Linked Data



**:A\_Trip\_to\_the\_Moon**



**:Excursion\_to\_the\_Moon**





# Exploratory Search based on Linked Data



:A\_Trip\_to\_the\_Moon

rdf:type

yago:Abstraction100002137  
yago:Artifact100021939  
yago:Creation103129123  
yago:Event100029378  
yago:Movie106613686  
yago:Object100002684  
yago:PhysicalEntity100001930  
yago:Product104007894  
yago:PsychologicalFeature100023100  
yago:Show106619065  
yago:SocialEvent107288639  
yago:Whole100003553  
yago:WikicatComedyScienceFictionFilms  
yago:WikicatSpaceAdventureFilms



dct:subject

dbc:Moon\_in\_Film

rdf:type

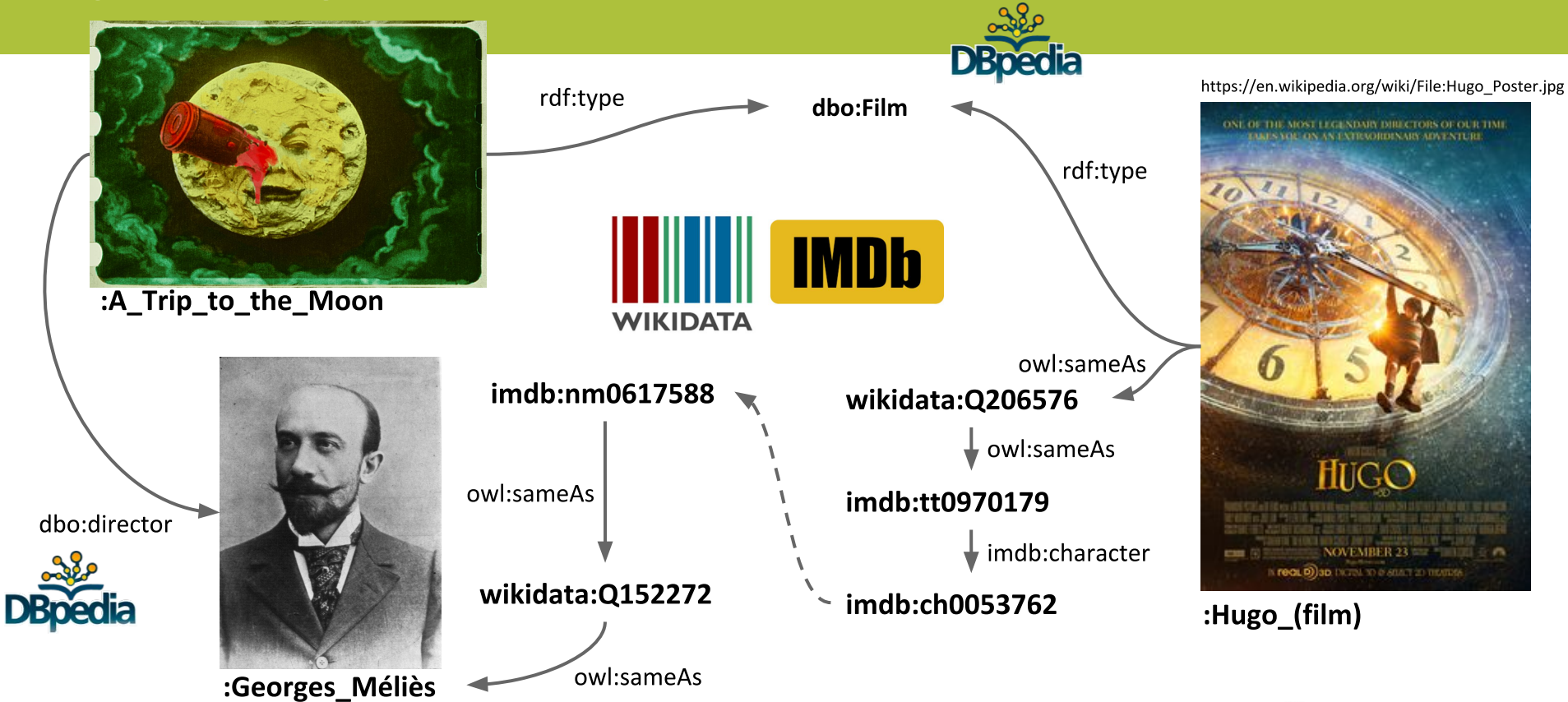
[https://en.wikipedia.org/wiki/File:Iron\\_sky\\_poster.png](https://en.wikipedia.org/wiki/File:Iron_sky_poster.png)



:Iron\_Sky

dct:subject

# Exploratory Search based on Linked Data



# Exploratory Search and Recommender Systems

- Fluent boundaries between **exploratory search** and (content-based) **recommendation**
- Both are depend on **ranking of facts**
  - *Which fact is more “important”?*  
*(1) Albert Einstein was a physicist.*  
*or*  
*(2) Albert Einstein was a vegetarian.*
- The importance of a fact often depends on the given **context**
- **Knowledge graphs** in combination with **language models** and **logfile data** can be exploited to automatically learn **ranking heuristics**

# Thank you very much for your attention!

## Kontakt, Ansprechpartner/in

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harald.sack@fiz-karlsruhe.de

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[www.fiz-karlsruhe.de](http://www.fiz-karlsruhe.de)

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Mitglied der  
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Leibniz-Gemeinschaft



Information Service Engineering Prof. Dr. Harald Sack, Dr. Maria Koutraki

Course Administration

Course is available

- Learnings
- Discussions
- Progress
- Collab Space
- Course Details**
- Announcements
- Recap

**Information Service Engineering**  
Lecture Overview

FIZ Karlsruhe  
Karlsruhe Institute of Technology  
Spring 2018

Prof. Dr. Harald Sack & Dr. Maria Koutraki  
FIZ Karlsruhe  
Karlsruhe Institute of Technology  
Spring 2018

0:00 / 4:50

- share
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- share
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The information available today exceeds all limits. Access to this abundance of data is only possible via search engines and sophisticated information processing applications. To enable the transition from raw data to well-structured knowledge, technologies such as natural language processing, information retrieval, and data and knowledge mining must be applied. In this MOOC, you will learn the fundamentals of natural language processing as well as the basics of Linked Data-based knowledge representation and machine learning to enable the transition from unstructured data to machine processable knowledge.

- April 16, 2018 - June 11, 2018
- Language: English
- Booking a Qualified Certificate is no longer possible.

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<https://open.hpi.de/courses/semanticweb2017>

### Course information

The information available today exceeds all limits. Access to this abundance of data is only possible via search engines and sophisticated information processing applications. To enable the transition from raw data to well-structured knowledge, technologies such as natural

### Dates and Statistics

Learners enrolled: **5012**



# DBpedia SPARQL Recommender Playground

## Virtuoso SPARQL Query Editor

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Default Data Set Name (Graph IRI)

Query Text

```
select SAMPLE(?lr) as ?title SAMPLE(?ldirector) as ?director COUNT (DISTINCT ?subject) AS ?similarity GROUP_CONCAT(?lsubject;separator=', ') WHERE {
dbr:A_Trip_to_the_Moon ?p ?subject .
?r rdf:type dbo:Film ;
  dbo:director ?director ;
  ?p ?subject;
  rdfs:label ?lr FILTER (LANG(?lr)="en") FILTER (?director!=dbr:Georges_Méliès).
?director rdfs:label ?ldirector FILTER (LANG(?ldirector)="en") .
?subject rdfs:label ?lsubject FILTER (LANG(?lsubject)="en") .
} GROUP by ?r
ORDER BY DESC (?similarity)
```

[Run SPARQL query](#)

# DBpedia SPARQL Recommender Playground



title	director	similarity	
"Excursion to the Moon"@en	"Segundo de Chomón"@en	8	movie, work, Articles containing video clips, French films, French science fiction films, Pre-1950 science fiction films
"The Crazy Ray"@en	"René Clair"@en	7	movie, work, French films, French science fiction films, Pre-1950 science fiction films
"The Tunnel (1933 French-language film)"@en	"Curtis Bernhardt"@en	6	movie, work, French films, French science fiction films, Pre-1950 science fiction films
"La Fée aux Choux"@en	"Alice Guy-Blaché"@en	6	movie, work, Articles containing video clips, French films, French silent short films
"The Assassination of the Duke of Guise"@en	"Charles le Bargy"@en	6	movie, movie, work, work, Articles containing video clips, French films, French silent short films
"The Tunnel (1933 German-language film)"@en	"Curtis Bernhardt"@en	6	movie, work, French films, French science fiction films, Pre-1950 science fiction films
"Roundhay Garden Scene"@en	"Louis Le Prince"@en	6	movie, work, Articles containing video clips, French films, French silent short films
"L'Arrivée d'un train en gare de La Ciotat"@en	"Auguste and Louis Lumière"@en	6	movie, work, Articles containing video clips, French films, French silent short films
"End of the World (1931 film)"@en	"Abel Gance"@en	6	movie, work, French films, French science fiction films, Pre-1950 science fiction films
"Satán se divierte"@en	"Segundo de Chomón"@en	5	movie, work, Articles containing video clips, French films, French black-and-white films
"La Tosca (1909 film)"@en	"Charles le Bargy"@en	5	movie, movie, work, work, French films, French silent short films, French black-and-white films
"Pauvre Pierrot"@en	"Charles-Émile Reynaud"@en	5	movie, work, Articles containing video clips, French films, French silent short films
"Fantômas (1913 serial)"@en	"Louis Feuillade"@en	5	movie, work, Articles containing video clips, French films, French black-and-white films
"Pelicans, London Zoological Gardens"@en	"Alexandre Promio"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Démolition d'un mur"@en	"Auguste and Louis Lumière"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Un drame au château d'Acres"@en	"Abel Gance"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Les Vampires"@en	"Louis Feuillade"@en	5	movie, work, Articles containing video clips, French films, French black-and-white films
"La Voltige"@en	"Auguste and Louis Lumière"@en	5	movie, work, French films, French silent short films, French black-and-white films
"La Mer (film)"@en	"Auguste and Louis Lumière"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Les Trois Mousquetaires"@en	"Henri Diamant-Berger"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Lion, London Zoological Gardens"@en	"Alexandre Promio"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Partie de cartes"@en	"Auguste and Louis Lumière"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Max and His Mother-in-Law"@en	"Max Linder"@en	5	movie, work, French films, French silent short films, French black-and-white films
"La Digue (film)"@en	"Abel Gance"@en	5	movie, work, French films, French silent short films, French black-and-white films
"The Mask of Horror"@en	"Abel Gance"@en	5	movie, work, French films, French silent short films, French black-and-white films
"La fée printemps"@en	"Ferdinand Zecca"@en	5	movie, movie, work, work, Articles containing video clips, French films, 1902 films
"La Charcuterie mécanique"@en	"Auguste and Louis Lumière"@en	5	movie, work, French films, French science fiction films, Pre-1950 science fiction films
"L'Inhumaine"@en	"Marcel L'Herbier"@en	5	movie, work, French films, Pre-1950 science fiction films, French black-and-white films
"La Souriante Madame Budet"@en	"Germaine Dulac"@en	5	movie, work, Articles containing video clips, French films, French black-and-white films
"Les Forgerons"@en	"Auguste and Louis Lumière"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Repas de bébé"@en	"Auguste and Louis Lumière"@en	5	movie, work, French films, French silent short films, French black-and-white films
"La Pêche aux poissons rouges"@en	"Auguste and Louis Lumière"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Danse des Ouléd-Naïd"@en	"Segundo de Chomón"@en	5	movie, work, Articles containing video clips, French films, 1902 films
"The Photographical Congress Arrives in Lyon"@en	"Auguste and Louis Lumière"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Alphaville (film)"@en	"Jean-Luc Godard"@en	5	movie, work, French films, French science fiction films, French black-and-white films
"Place des Cordeliers à Lyon"@en	"Auguste and Louis Lumière"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Le Dernier Combat"@en	"Luc Besson"@en	5	movie, work, French films, French science fiction films, French black-and-white films
"Fantasmagorie (1908 film)"@en	"Émile Cohl"@en	5	movie, work, Articles containing video clips, French films, French black-and-white films
"Workers Leaving the Lumière Factory"@en	"Auguste and Louis Lumière"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Barcelona, Parc au crépuscule"@en	"Segundo de Chomón"@en	5	movie, work, Articles containing video clips, French films, French black-and-white films
"Le Saut à la couverture"@en	"Auguste and Louis Lumière"@en	5	movie, work, French films, French silent short films, French black-and-white films
"Jack and the Beanstalk (1902 film)"@en	"Edwin S. Porter"@en	5	movie, movie, work, work, Articles containing video clips, 1902 films, 1900s and 1910s films
"The First Men in the Moon (1919 film)"@en	"Bruce Gordon (actor/director)"@en	5	movie, work, Moon in film, Pre-1950 science fiction films. Films based on works by H. G. Wells