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From Data to the Press: Data Management for Journalism and Fact-Checking

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From Data to the Press: Data Management for Journalism and Fact-Checking

Ioana Manolescu

CEDAR team, Inria Saclay and Ecole Polytechnique

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DATA Conference, July 2020

MOTIVATION

Bad memories: Romania, 1989



Bad memories: Romania, 1989



Ceaușescu re-elected at the 14th congress!

Bad memories: Romania, 1989



Ceaușescu re-elected at the 14th congress!

He had held power since 1965.

Bad memories: Romania, 1989



Bad memories: Romania, 1985



1990: Things get better



... kind of



1000 dead (approx.)
No one convicted.

Democratic societies crucially need the press

❑ To debate and express dissent



❑ To analyze, confirm or refute public statements

Fact-checking

(Data) journalism

❑ To expose and explain society functioning



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Fact-checking

(Data) journalism

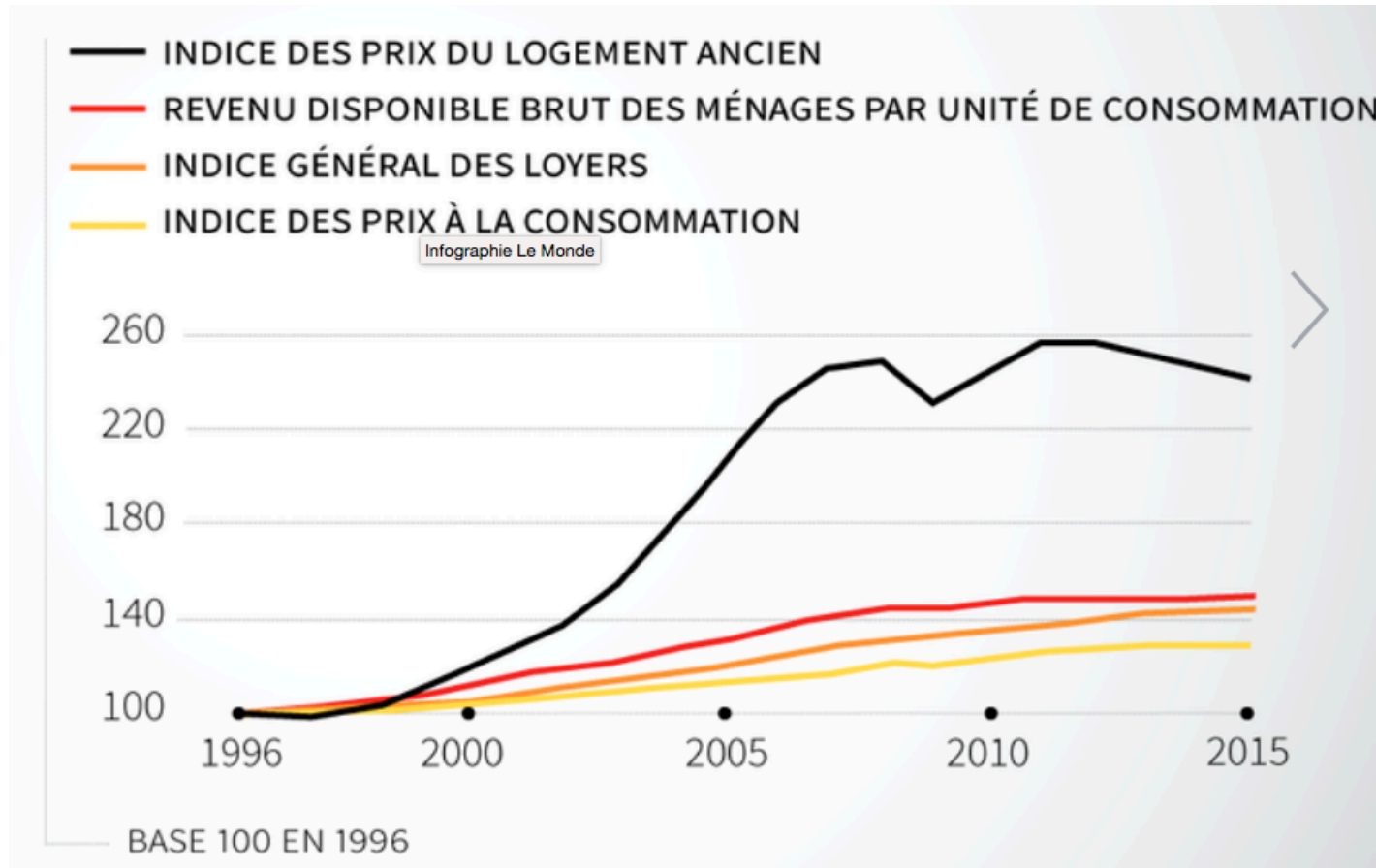
❑ To expose and explain society functioning



**DATA JOURNALISM,
JOURNALISTIC FACT-CHECKING,
FAKE NEWS DETECTION**

Data journalism

Investigative journalism based on **complex and/or large data**



http://abonnes.lemonde.fr/les-decodeurs/portfolio/2017/04/18/les-fractures-francaises-1-5-le-logement-les-raisons-de-la-crise_5112859_4355770.html

Fact-checking (since 1930 approx.)

Fact-checking: verification of facts mentioned **in media content**

- ❑ To protect media reputation and avoid legal action

“The day I became a fact-checker at The New Yorker, I received **one set of red pencils** [...] for underlining **passages** on page proofs of articles that might contain **checkable facts**. [...] confirmed **with the help of reference books** from the magazine’s library”



<http://www.nytimes.com/2010/08/22/magazine/22FOB-medium-t.html>

Fact-checking (2012 – ongoing)


Not everyone agrees, however, that Democrats are not flip-flopping on the issue.

Mark Krikorian, executive director of the Center for Immigration Studies, a think tank that advocates for lower immigration, said that because the public doesn't know exactly what border barriers the Trump administration wants to build, Mulvaney's statement is not an "exact" comparison. But, he said, to dismiss it simply on that basis would be "tendentiously literal."

"The fact is that, other than the 'Mexico will pay for it' stuff, Trump is simply channeling the 2006 Secure Fence Act, and Schumer et al. who voted for it out of political calculation are indeed hypocrites for opposing the attempt to finally bring that law to fruition," Krikorian told us via email.

At the surface level, it is true in a broad sense that Democrats including Schumer, Obama and Clinton have in the past supported border fencing. All three voted for the Secure Fence Act of 2006, and all three supported the 2013 Senate immigration overhaul that passed the Senate, and which called for tougher border security including some additional fencing. But to claim that those measures are the same as what Trump is proposing is a stretch.

Share The Facts





Mick Mulvaney
Director, Office of Management and Budget

"We don't understand why the Democrats are so wholeheartedly against [President Trump's border wall]. They voted for it in 2006."

Fox News Sunday – Sunday, April 23, 2017

[SHARE](#) [READ MORE](#)

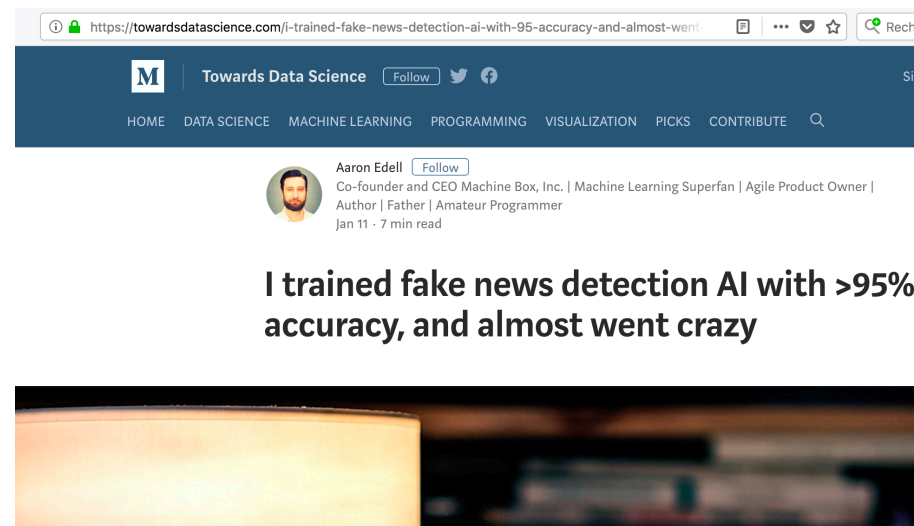




The screenshot shows the FactCheck.org website. The article title is "Did Democrats Once Support Border Wall?" by Robert Farley, posted on April 26, 2017. The article content includes a quote from Mick Mulvaney and a question-and-answer section. The website features a navigation bar with links for HOME, ARTICLES, ASK A QUESTION, VIRAL SPIRAL, ARCHIVES, ABOUT US, SEARCH, and MORE. There are also social media sharing buttons and a "DONATE" button. The article is rated as "MISLEADING" by the Politifact Truth-O-Meter.

Fact checking vs. fake news detection

- ❑ Fact checking is based on some **background information source**
 - ❑ **Truth commonly agreed upon**
- ❑ Fake news detection may or may not use a source
 - ❑ E.g., *text classifier* (true, fake) trained on *text style*



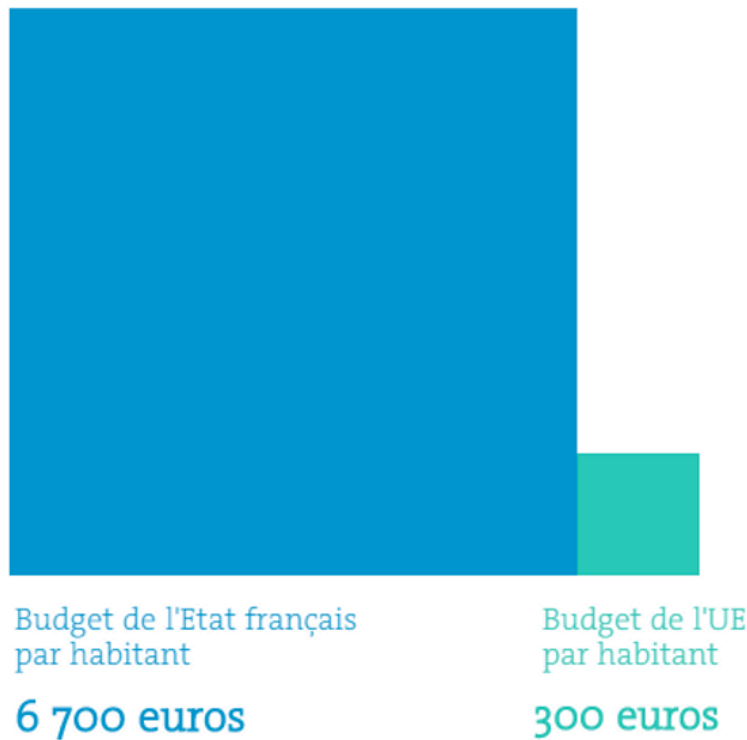
Common fact-checking scenarios

- "What is the **value** of **metric X** in **space Y** at **time T**"?
 - **X**=youth unemployment, **Y**=Germany, **T**=2018
 - **X**=illegal immigrants, **Y**=Italy, **T**=[2015-2018]
 - **X**=budget for research, **Y**=France, **T**=2019
- Comparison patterns
 - **X1** against **X2**; **Y1** against **Y2**; **T1** against **T2**;
temporal trend etc.

Common fact-checking scenarios

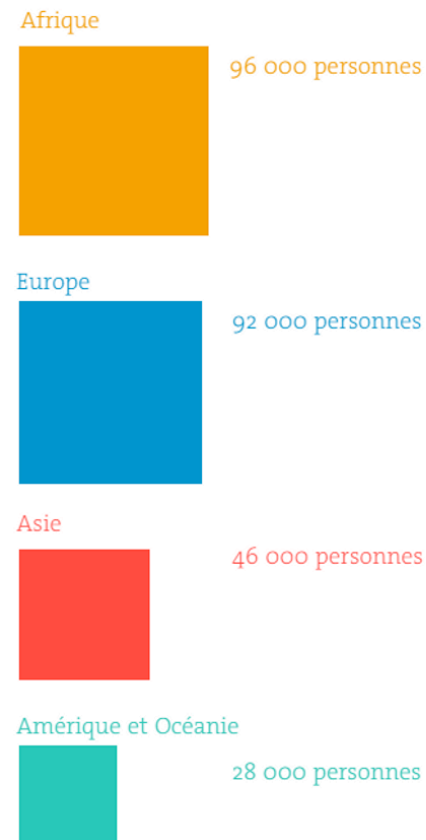
Le budget européen par habitant pèse nettement moins que celui de la France

Budgets pour l'année 2018 de l'UE et de la France rapportés à leurs populations respectives.



Parmi les immigrés en France, presque autant d'Européens que d'Africains

Lieu de naissance des personnes entrées sur le territoire national en 2017



Source : Insee

Common fact-checking scenarios

□ "What did **X** say about **Y** [at time **T**]"?



□ "Is **X** related [in sense **S**] to **Y**?"

FRANCE — ENQUÊTE

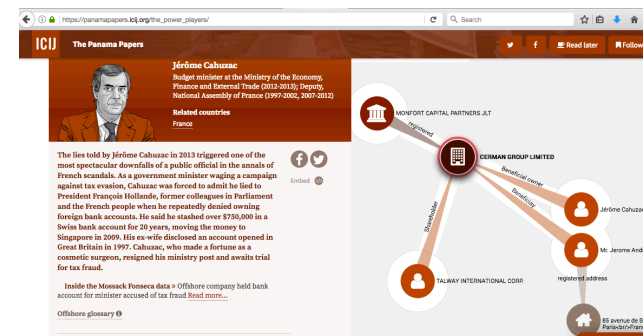
Nicolas Sarkozy a bien servi les intérêts de Kadhafi. Voici les preuves

4 AVR. 2018 | PAR FABRICE ARFI ET KARL LASKE



Nicolas Sarkozy et Mouammar Kadhafi devant la maison du second bombardée par les Américains. © Reuters

Contrairement à ce qu'il a affirmé devant les juges puis dans les médias, Nicolas Sarkozy, actuellement mis en examen pour corruption dans l'affaire des financements libyens, a objectivement servi les intérêts du régime de Kadhafi entre 2005 et 2011. La preuve en cinq actes.



Common fact-checking scenarios

- ❑ The French catholic priest beaten by thugs in 2017 that the media won't tell you about

LES DÉCODEURS

Favoris  | Partage 

Des militants dénoncent l'omerta des médias sur l'agression d'un prêtre à Avignon... qui date de 2013

« Agression d'un prêtre lundi dernier, aucune info des médias », s'insurge un message d'un militant pro-FN, partagé des dizaines de milliers de fois sur Facebook.

Par Adrien Sénécat · Publié le 27 février 2017 à 13h01 - Mis à jour le 13 mars 2017 à 12h36

 Lecture 2 min.

« Si les médias n'en parlent pas, on va s'en charger... » Corentin Clamens, un internaute qui se présente comme président du collectif France Jeunesses (proche du FN) et soutien de Marine Le Pen, a partagé, mercredi 15 février, sur Facebook, un message dénonçant l'agression d'un prêtre « *lundi dernier* » à Avignon (Vaucluse). Fait dont aucun média n'aurait parlé, selon lui. Mais, contrairement à ce que ce message laisse entendre, l'histoire, qui date de 2013, a été largement évoquée par la presse à l'époque. Explications.

CE QUE DIT LA RUMEUR



Fact-checking and/or fake news detection apply here

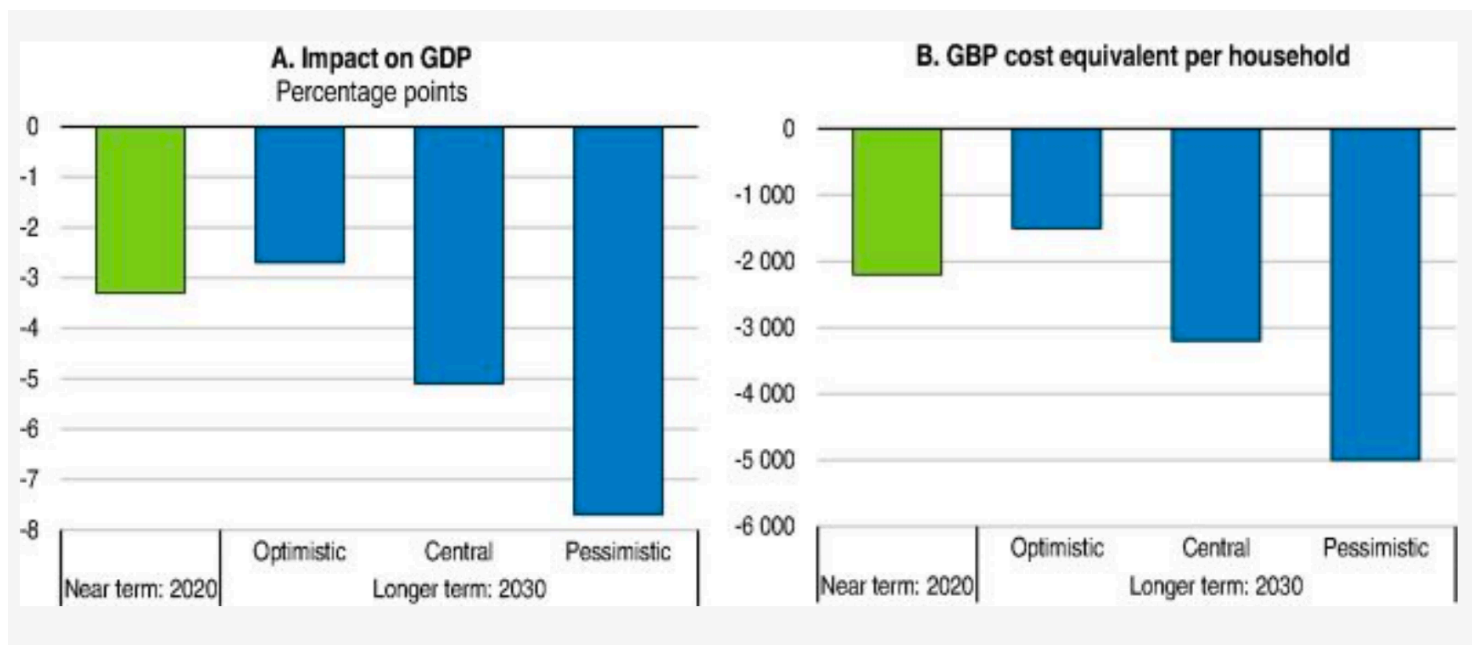
□ The pope and the tablecloth



<https://www.youtube.com/watch?v=1KFj6b1Xfe8>

Where fact checking meets data journalism

- ❑ Most aspects of modern reality are **complex**
- ❑ **Explaining** can be as important and useful as checking
 - ❑ Also to analyze the future, e.g., Brexit impact:



<http://www.oecd.org/economy/the-economic-consequences-of-brexit-a-taxing-decision.htm>

Old-style fact-checking: Radio Yerevan jokes

Famous in the Eastern block during communism

Q1: *Is it true* that in Moscow, Mercedes cars are being given to citizens?"

A1: "Yes, *but* it is not Moscow but Leningrad, not Mercedes but Ladas, and not given to but stolen from."

Q2: *Is it true* that in Romania...

A2: Yes it is.

A CONTENT MANAGEMENT PERSPECTIVE

Lines of past and current research

1. **Model fact-checking** through a data and information management perspective
2. Identify **applicable tools and techniques**
 - In a special journalistic context (see next)
3. Devise **new models, tools and techniques** for fact-checking and data journalism problems

Past projects and collaborations

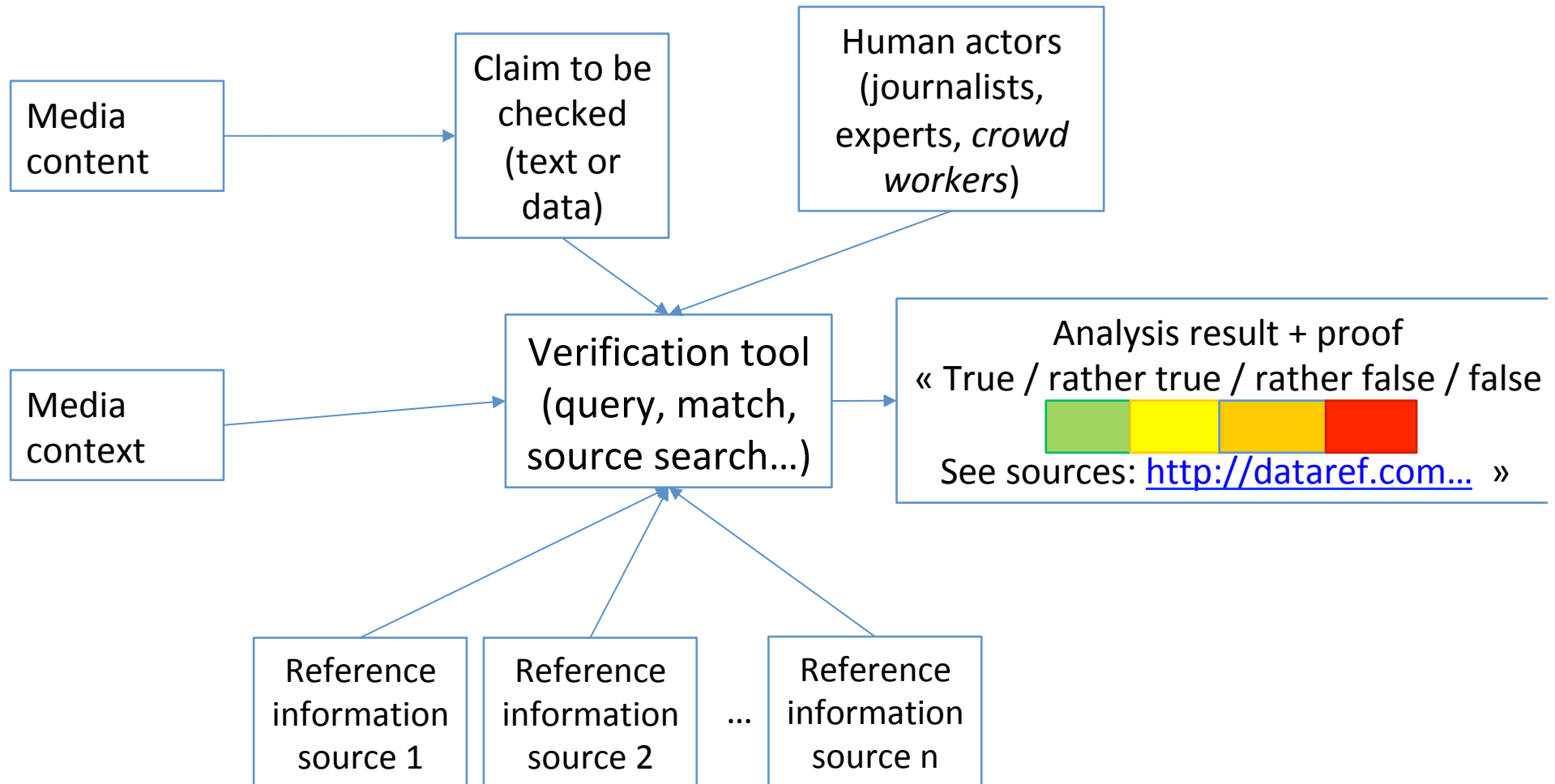
- ❑ **Google Award** (2015) with X. Tannier (LIMSI)
- ❑ **ANR ContentCheck** (2016-2019) with X. Tannier (Sorbonne Université), S. Cazalens, P. Lamarre, J.-M. Petit, M. Plantevit (U. Lyon), F. Goasdoué (U. Rennes 1), Les Décodeurs (Le Monde)

<http://contentcheck.inria.fr>

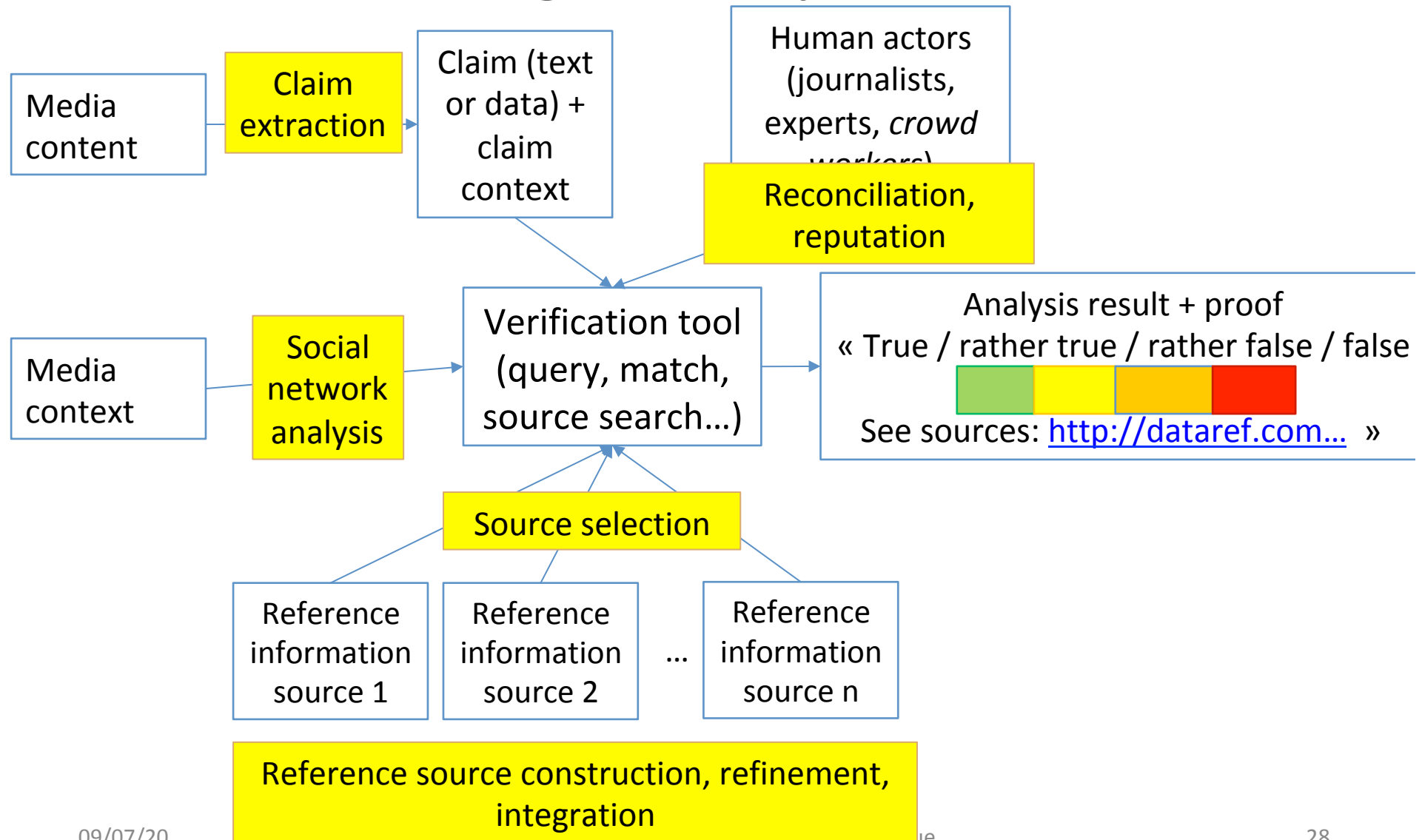
- ❑ **Inria Associated Team WebClaimExplain** with AIST Japan (Julien Leblay)
- ❑ **Collaborations** with H. Galhardas (University of Lisbon), former PhD S. Zampetakis and others



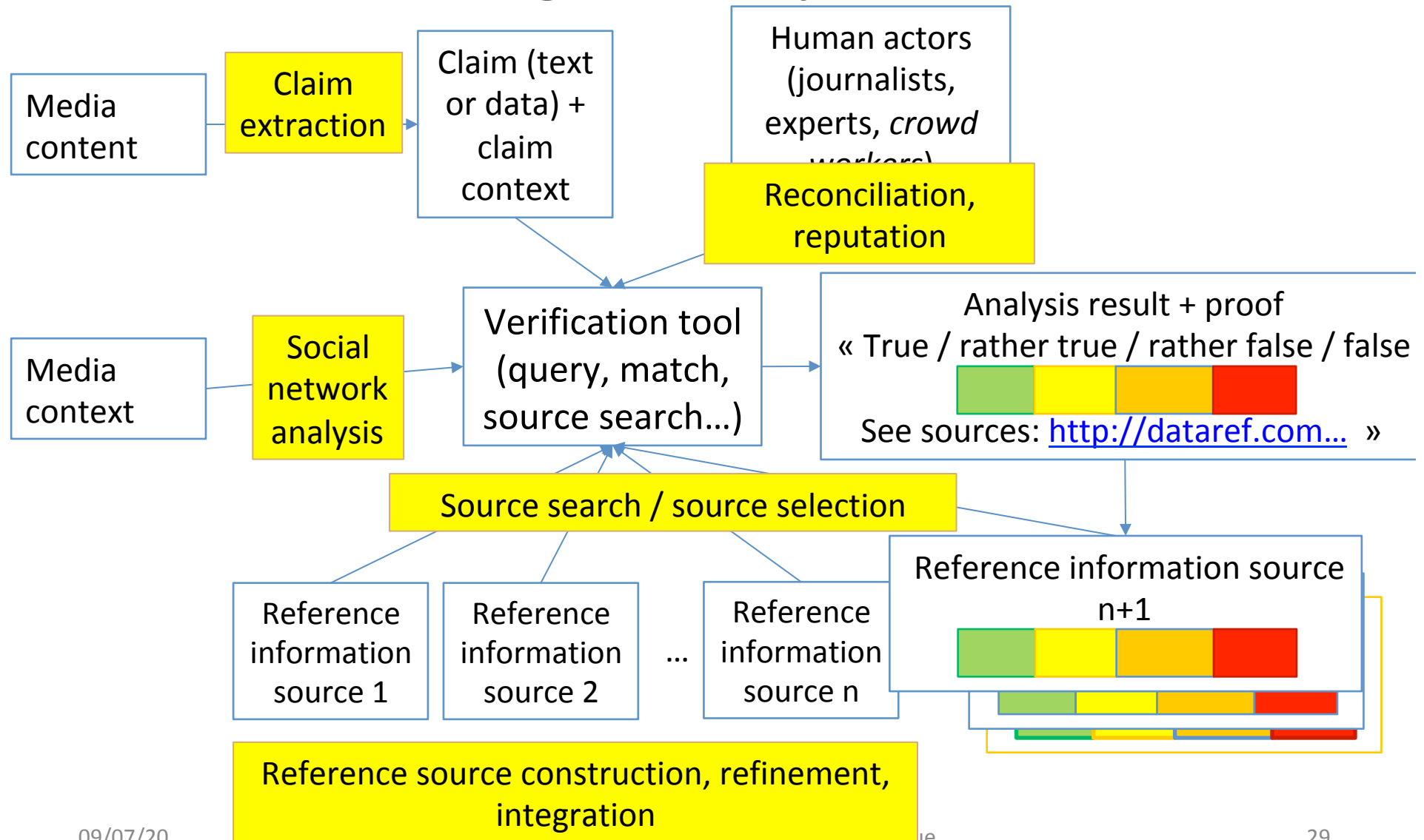
Fact-checking as a content management problem



Fact-checking as a content management problem



Fact-checking as a content management problem



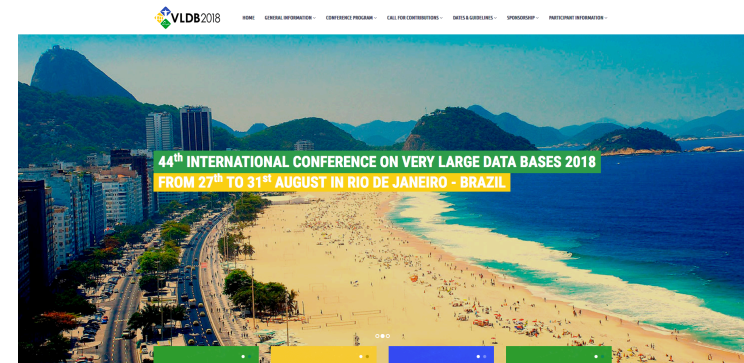
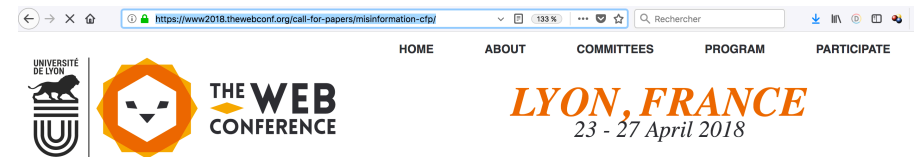
Fact-checking as a content management problem

[WWW2018] "A Content Management Perspective on Fact-Checking", S. Cazalens, J. Leblay, I. Manolescu, X. Tannier (fact-checking track)

[WWW2018 tutorial] "Computational fact-checking: problems, state of the art, and perspectives", J. Leblay, I. Manolescu, X. Tannier


[VLDB2018 tutorial] "Computational fact-checking: a content management perspective", S. Cazalens, J. Leblay, P. Lamarre, I. Manolescu, X. Tannier

<http://contentcheck.inria.fr/>



Fact-checks shared as open data!

http://s1.lemde.fr/mmpub/data/decodex/hoax/hoax_debunks.json



The screenshot shows a web browser window with the address bar displaying 'file:///Users/ioanamanolescu/Downloads/hoax_debunks(3).json'. Below the address bar, there are tabs for 'JSON', 'Données brutes', and 'En-têtes'. A toolbar contains buttons for 'Enregistrer', 'Copier', and 'Formater et indenter'. The main content area displays a JSON object with two main keys: 'debunks' and 'hoaxes'. The 'debunks' key contains an array of two objects, each with a numeric ID, a question, a truth value ('FAUX'), and a URL. The 'hoaxes' key contains an array of URLs, each with a truth value ('1' or '2').

```
{
  "debunks": {
    "1": [
      "Ce prêtre a-t-il été agressé à Avignon en février 2017, sans que les médias n'en parlent ?",
      "FAUX",
      "La rumeur fait référence à une vraie agression, mais qui date de mai 2013. Les faits ont alors été largement évoqués par de nombreux médias régionaux et nationaux.",
      "https://www.lemonde.fr/les-decodeurs/article/2017/02/27/des-militants-denoncent-l-omerta-des-medias-sur-l-agression-d-un-pretre-a-avignon-qui-date-de-2013_5086287_4355770.html"
    ],
    "2": [
      "Emmanuel Macron a-t-il déclaré vouloir faire payer un loyer aux propriétaires ?",
      "FAUX",
      "Il s'agit d'un article du site parodique BuzzBeed. En réalité, la mesure ne figure pas au programme du candidat. ",
      "https://crosscheck.firstdraftnews.com/checked-french/macron-a-t-il-declare-vouloir-faire-payer-un-loyer-aux-proprietaires"
    ]
  },
  "hoaxes": {
    "https://www.facebook.com/CorentinFNJ/posts/250959068694828": "1",
    "http://www.paulomouvementcitoyen.com/2017/02/un-pretre-agresse-a-avignon.html": "1",
    "https://www.blog.sami-aldeeb.com/2017/02/06/pretre-agresse-a-avignon-si-ca-avait-ete-un-imam/": "1",
    "https://francaisdefrance.wordpress.com/2016/12/12/agression-dun-moine-hier-soir-silence-total-heureusement-il-y-a-internet/": "1",
    "https://www.facebook.com/10212204315883498/posts/10212140163199721": "1",
    "https://www.facebook.com/387841388254774/posts/383701835335396": "1",
    "https://twitter.com/MONSTERLOVE696/status/976170425272160258": "1",
    "https://www.buzzbeed.com/macron-veut-faire-payer-un-loyer-aux-proprietaires": "2",
    "https://www.facebook.com/Nellyc857/posts/714805762059840": "2",
    "https://www.facebook.com/439281732799406/posts/1433189213408648": "2",
    "https://www.facebook.com/BuzzBeed/posts/620907048117319": "2",
    "https://www.facebook.com/PorteTesCouilles2/posts/1282028511833044": "2",
    "https://www.facebook.com/439281732799406/posts/1369912906402946": "2",
  }
}
```

Which data sources for fact-checking and data journalism ?

- ❑ Journalists do not, historically, build databases.
 - ❑ "Writers, not techies"
 - ❑ "Not part of our job"
 - ❑ Persisting data is novel to some
 - ❑ Journal information systems not always helpful
- ❑ However, some journals (e.g., OuestFrance) have valuable (reference) databases



Which data sources for fact-checking and data journalism ?

- ❑ **Curse of the coverage:** they need to cover (almost) any topic
- ❑ **Curse of newsworthiness:** write about hot topics of today (or tomorrow)
- ❑ They work under **strong time pressure**
- ❑ Good journalists are very **picky** with their data sources

Which data sources for fact-checking and data journalism ?

- ❑ Good journalists are very **picky** with their data sources...
- ❑ Which are **heterogeneous**: HTML, JSON, Excel, XML, CSV etc.
- ❑ Journalists won't write queries.
They may not know what they're looking for
- ❑ The fact-checking process and result must be **explainable**
 - ❑ Not (only) "an ML algorithm said so"

Improving access to reference data sources

[WebDB2018, SBD2017] T. D. Cao, I. Manolescu, X. Tannier.

"Extracting Linked Data from statistic spreadsheets"

“Créations d’entreprises en France en 2015” → return:

Créations d'entreprises dans quelques pays de l'Union européenne en 2015

en %

| Pays | Taux de création |
|--------------------|------------------|
| Allemagne | 7,1 |
| Belgique | 6,2 |
| Espagne | 9,5 |
| France (1) | 9,5 |
| Italie | 7,5 |
| Pays-Bas | 10,1 |
| Portugal | 15,7 |
| République tchèque | 8,2 |
| Royaume-Uni | 14,3 |

Improving access to reference data sources

[WebDB2018, SBD2017] T. D. Cao, I. Manolescu, X. Tannier.
 "Extracting Linked Data from statistic spreadsheets"

← → ↻ 🏠 https://statsearch.inria.fr ... 📄 ⌂ ☰

Déconnectez-vous: [mioana](#)

Recherche consommation électricité 2012

| Rang | Lien | Date de publication | Score | Cellule de donnée | Votre évaluation | | | |
|--|---|-------------------------|-----------|--|--|------|---------------|--|
| 1 | NCE_T1 : Consommation d'énergie en milliers de tonnes-équivalent-pétrole (kTEP) et nombre d'établissements selon la nomenclature des activités consommatrices d'énergie https://www.insee.fr/fr/statistiques/fichier/3125025/irecoacei15_excel.zip /data/tcao/insee/3125025/irecoacei15_excel/multiple_SL_T1/0/0.ttl | Paru le : 16/10/2017 | 1389.0000 | <table border="1"> <tr> <td>Electricité consommée hors utilisation en tant que matière première (en %)</td> <td>2012</td> <td>33.6</td> </tr> </table> <p>Tous les résultats</p> | Electricité consommée hors utilisation en tant que matière première (en %) | 2012 | 33.6 | <input checked="" type="radio"/> rien <input type="radio"/> pas pertinent <input type="radio"/> un peu pertinent <input type="radio"/> bien pertinent Commentaire |
| Electricité consommée hors utilisation en tant que matière première (en %) | 2012 | 33.6 | | | | | | |
| 2 | Production brute et consommation d'électricité en 2015 en TWh https://www.insee.fr/fr/statistiques/2015872#tableau-tableau /data/tcao/insee/2015872/tableau-tableau.ttl | Paru le : 16/12/2016 | 1165.0000 | <table border="1"> <tr> <td>Consommation des auxiliaires</td> <td>2012</td> <td>-24</td> </tr> </table> <p>Tous les résultats</p> | Consommation des auxiliaires | 2012 | -24 | <input checked="" type="radio"/> rien <input type="radio"/> pas pertinent <input type="radio"/> un peu pertinent <input type="radio"/> bien pertinent Commentaire |
| Consommation des auxiliaires | 2012 | -24 | | | | | | |
| 3 | 4.102 Éléments du compte d'exploitation des sociétés et des entreprises individuelles non financières (S11 et S14AA) https://www.insee.fr/fr/statistiques/fichier/2016008/comptes_annee_2013.zip /data/tcao/insee/2016008/comptes_annee_2013/comptes_annee_2013/multiple_t_5106/0/0.ttl | Paru le : 30/05/2014 | 1150.8741 | <table border="1"> <tr> <td>Production et distribution d'électricité, de gaz, de vapeur et d'air conditionné</td> <td>2012</td> <td>112.504</td> </tr> </table> | Production et distribution d'électricité, de gaz, de vapeur et d'air conditionné | 2012 | 112.504 | <input checked="" type="radio"/> rien <input type="radio"/> pas pertinent <input type="radio"/> un peu pertinent <input type="radio"/> bien pertinent Commentaire |
| Production et distribution d'électricité, de gaz, de vapeur et d'air conditionné | 2012 | 112.504 | | | | | | |
| 4 | 4.102 Éléments du compte d'exploitation des sociétés et des entreprises individuelles non financières (S11 et S14AA) https://www.insee.fr/fr/statistiques/fichier/2016008/comptes_annee_2013.zip /data/tcao/insee/2016008/comptes_annee_2013/comptes_annee_2013/multiple_t_6105d/1/0.ttl | Paru le : 30/05/2014 | 1150.8741 | <table border="1"> <tr> <td>Production et distribution d'électricité, de gaz, de vapeur et d'air conditionné</td> <td>2012</td> <td>1.74407359195</td> </tr> </table> | Production et distribution d'électricité, de gaz, de vapeur et d'air conditionné | 2012 | 1.74407359195 | <input checked="" type="radio"/> rien <input type="radio"/> pas pertinent <input type="radio"/> un peu pertinent <input type="radio"/> bien pertinent Commentaire |
| Production et distribution d'électricité, de gaz, de vapeur et d'air conditionné | 2012 | 1.74407359195 | | | | | | |
| 5 | reg_T4 - Autoproduction, achats et consommation d'électricité par usage en GWh selon la région https://www.insee.fr/fr/statistiques/fichier/2015833/irecoacei12_reg_T4.xls /data/tcao/insee/2015833/multiple_irecoacei12_reg_T4/0/0.ttl | Paru le : 23/02/2015 | 1119.0000 | <table border="1"> <tr> <td>Consommation (1 + 2)</td> <td></td> <td></td> </tr> </table> <p>Tous les résultats</p> | Consommation (1 + 2) | | | <input checked="" type="radio"/> rien <input type="radio"/> pas pertinent <input type="radio"/> un peu pertinent <input type="radio"/> bien pertinent Commentaire |
| Consommation (1 + 2) | | | | | | | | |

Recognizing statistic mentions in tweets [NLDB2019]

2020-03-05

En Marche

<https://twitter.com/enmarchefr/status/1235501467907260416>

L'index de l'égalité professionnelle change concrètement la vie des 4,5 millions de femmes en entreprise. En un an, la part des entreprises qui accordent une augmentation de salaire à la sortie du congé maternité est passée de 67% à 90%. Muriel Pénicaud Egalite F H

En un an , la **part de les entreprises qui accordent une augmentation de salaire à la sortie du congé maternité** est passée de **67 %** à **90 %** .

3/11

part de les entreprises qui accordent une augmentation de salaire à la sortie du congé maternité Recherche

2020-03-05

Bruno Bonnell

<https://twitter.com/BrunoBonnellOff/status/1235500886669045761>

Moins de 5% des voies françaises portent un nom de femmes! Une inégalité facile à rattraper. En baptisant les rues de noms de modèles féminins, nous encouragerons plus de jeunes filles à oser. Mvt Radical En Marche ...

Moins de **5 %** de les voies françaises portent un nom de **femmes** !

4/13

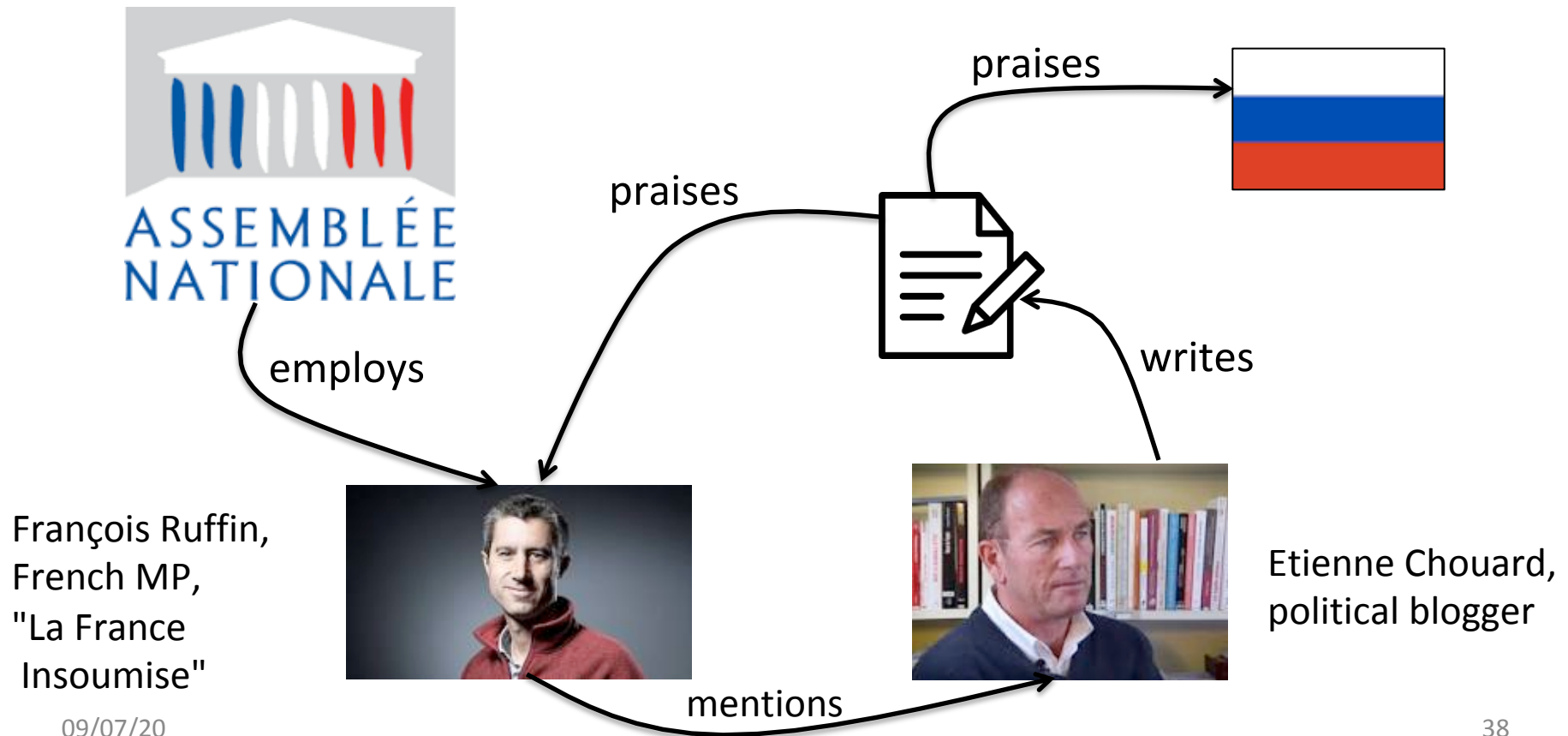
femmes 2020 Recherche

Automatically recognizes numerical mentions involving entities known from the INSEE corpus

Proposes keyword query to send to the previous statistics search algorithm.

ConnectionLens: interconnecting heterogeneous data sources [VLDB2018]

"What are the connections between elected members of the French National Assembly, and Russia?"



http://localhost:8080/demo/scenario?s=cl_magazine

CONNECTIONLENS Scenario: magazine Import data set About

explore tepatriote Search

Examples

1 result(s)

tepatriote: 1
RELATIONAL_VALUE

Size: 41, Score: 0.22
4 sources involved

Sources

- HTML
- JSON
- RELATIONAL

RELATIONAL: <jdbc:postgresql://localhost:5432/csv?currentSchema=whois&user=postgres>

| adminemail | nomdomaine | orgadresse | datecreation | orgadmin | cl:tuple |
|---------------------|----------------|--------------------------------------|---------------------|---------------|----------|
| tepatriote@yahoo.fr | topastuces.net | 15 avenue des Sablons Neuilly France | 2012-06-13T0:12:00Z | Les Patriotes | contents |

A data model for facts, statement and beliefs

Modeling who said what when

POLITICS January 19, 2018 7:19 pm Updated: January 19, 2018 7:24 pm

10 times that Trump has contradicted himself in his first year in office

By Darlene Superville The Associated Press

Comments 8 Facebook 398 Twitter Email Print ...



<https://globalnews.ca/news/3976740/trump-contradicted-first-year/>

[MisInfo@WWW2019, CIKM2019]

L. Duroyon, F. Goasdoué, I. Manolescu

"A Linked Data Model for Facts, Statements and Beliefs"

09/07/20

Ioana Manolescu, Inria and Ecole polytechnique

- ❑ Fact **F** (holds according to the database)
- ❑ Statement of **X** about **F**
 - ❑ It's only according to **X**
- ❑ Statement of **Y** about statement of **X** about **F**
 - ❑ Only according to **Y**

Facts: application-dependent

Statements: writes, says, declares, ...

40

A data model for facts, statement and beliefs

Modeling who said what when

POLITICS January 19, 2018 7:19 pm Updated: January 19, 2018 7:24 pm

10 times that Trump has contradicted himself in his first year in office

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Comments 8 Facebook 398 Twitter Email Print ...



<https://globalnews.ca/news/3976740/trump-contradicted-first-year/>

[MisInfo@WWW2019, CIKM2019]

L. Duroyon, F. Goasdoué, I. Manolescu

"A Linked Data Model for Facts, Statements and Beliefs"

09/07/20

Ioana Manolescu, Inria and Ecole polytechnique

- Fact **F**
- Statement of **X** about **F**
- Statement of **Y** about statement of **X** about **F**

Also:

- Time** (for facts and statements)
- Propagation of information** through communication →
- Who has heard of what when**

41

Lessons learned

- ❑ Work with **the right data**
 - ❑ The trusted data
- ❑ Work with the data **as it is**
 - ❑ Heterogeneous
 - ❑ Evolving usage and requirements prevent schema design, consolidation
 - ❑ **Extract, structure, connect**
- ❑ **Simplify** use
 - ❑ Keyword queries, canned queries

PERSPECTIVES

Google FactCheck tools

Google Fact Check Tools

Explorer

Markup Tool

APIs

Fact Check Explorer

list:recent



French



Claim by Sources multiples:

La photo d'un homme qui urine dans le métro parisien

AFP Factual rating: Faux

[Ce cliché d'un homme qui urine a été pris dans le métro de New York](#)

1 day ago

AFP Factual



Claim by الحملة الوطنية لتأميم ثروات البلاد:

L'ambassadeur de France en Tunisie évoque la possibilité d'amener des militaires français dans le sud de la Tunisie

Factual AFP rating: Faux

[Non, l'ambassadeur de France en Tunisie n'a pas évoqué la possibilité de recourir à l'armée française dans le sud du pays](#)

1 day ago

Tunisie

Ambassade de France / سفارة فرنسا

France

Factual AFP

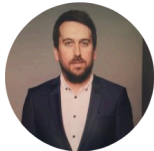
Twitter approach to limiting false information spreading



Yoel Roth

@yoyoel

Head of Site Integrity



Nick Pickles

@nickpickles

Director, Global Public
Policy Strategy &
Development

Product

Updating our Approach to Misleading Information

By [Yoel Roth](#) and [Nick Pickles](#)

Monday, 11 May 2020

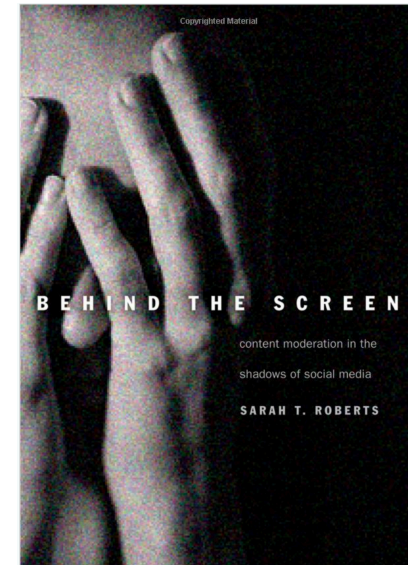
In serving the public conversation, our goal is to make it easy to find credible information on Twitter and to limit the spread of potentially harmful and misleading content. Starting today, we're introducing new labels and warning messages that will provide additional context and information on some Tweets containing disputed or misleading information related to COVID-19.

In March, we [broadened our policy](#) guidance to address content that goes directly against guidance on COVID-19 from authoritative sources of global and local public health information. Moving forward, we may use these labels and warning messages to provide additional explanations or clarifications in situations where the risks of harm associated with a Tweet are less severe but where people may still be confused or misled by the content. This will make it easier to find facts and make informed decisions about what people see on Twitter.

New labels and warnings

ML-based fake news detection

- ❑ Good use case for learning based on labeled examples
- ❑ Problems:
 - ❑ Manual effort required by labeling
 - ❑ Scale
 - ❑ Fake news detection speed
- ❑ All these problems are solved (or easy to solve) by Web giants who already employ tens of thousands of *commercial content moderators*



Antonio A. Casilli

EN ATTENDANT
LES ROBOTS

Enquête sur le travail du clic



LA COULEUR DES IDÉES

SEUIL

CS research for fact-checking

- ❑ DB, KR, IR, NLP
- ❑ In its most general statement, fact-checking supposes perfect NLP → study **sub-problems!**
- ❑ In fact-checking journalism, **human writers** chose topics, angle, style...
 - ❑ "A story wrapped around a query"
- ❑ Vision: build "**perfect data machines**" and give them to talented writers

A vision of journalistic dataspace

- ❑ "Dataspace": Franklin, Halevy and Maier, SIGMOD Record 2005
- ❑ Ingest **data of any nature**: structured (relational), semistructured (JSON, XML, (social) graphs), unstructured (text), KB...
- ❑ Storage, indexing
- ❑ Search **across the data sources**

Requirements for journalistic dataspace

- ❑ Time
 - ❑ Of data acquisition
 - ❑ Of events described in the data
- ❑ Provenance
 - ❑ Authorship metadata
 - ❑ Annotation by users
 - ❑ Access control based on provenance and annotations
- ❑ Ability to "derive" content (à la views)
- ❑ Semantic annotation and classification
- ❑ Social connections analysis
- ❑ Friendly interfaces
- ❑ Scalability

A vision of journalistic dataspace

ANR AI Chair "SourcesSay": Intelligent Analysis and Interconnexion of Heterogeneous Data in Digital Arenas (2020-2024) (co-financed by DGA)

- ❑ With support from **Le Monde** and **WeDoData**
- ❑ <https://project.inria.fr/sourcessay/>

 *PhD funding available!*

- ❑ 1 or 2 PhDs to start in 2020 on SourcesSay
- ❑ 1 PhD funded by Région Île-de-France in collaboration with WeDoData