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You!

Thanks

P. Lopez
T. Simcoe

Sections

US00RE41175E

(19) **United States**

(12) **Reissued Patent**
Vashisth et al.

(10) **Patent Number: US RE41,175 E**
(45) **Date of Reissued Patent: Mar. 30, 2010**

(54) **GPS-ENHANCED SYSTEM AND METHOD FOR AUTOMATICALLY CAPTURING AND CO-REGISTERING VIRTUAL MODELS OF A SITE**

(75) Inventors: **Robert M. Vashisth**, Salt Lake City, UT (US); **James U. Jensen**, Salt Lake City, UT (US); **James W. Bunger**, Salt Lake City, UT (US)

(73) Assignee: **Intelisum, Inc.**, Salt Lake City, UT (US)

(21) Appl. No.: **11/480,248**
(22) Filed: **Jun. 30, 2006**

Related U.S. Patent Documents

Reissue of:
(64) Patent No.: **6,759,979**
Issued: **Jul. 6, 2004**
Appl. No.: **10/348,275**
Filed: **Jan. 21, 2003**

U.S. Applications:
(60) Provisional application No. 60/350,860, filed on Jan. 22, 2002.

(51) **Int. Cl.**
G01S 5/14 (2006.01)
G06T 15/00 (2006.01)
G09G 5/00 (2006.01)
H04N 5/225 (2006.01)

(52) **U.S. Cl.** **342/357.13**; 345/419; 345/629; 348/218.1

(58) **Field of Classification Search** 342/357.13; 345/419, 629; 348/218.1
See application file for complete search history.

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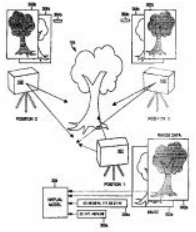
Primary Examiner—Gregory C Issing
(74) *Attorney, Agent, or Firm*—Austin Rapp & Hardman

(57) **ABSTRACT**

A system for capturing a virtual model of a site includes a range scanner for scanning the site to generate range data indicating distances from the range scanner to real-world objects. The system also includes a global positioning system (GPS) receiver coupled to the range scanner for acquiring GPS data for the range scanner at a scanning location. In addition, the system includes a communication interface for outputting a virtual model comprising the range data and the GPS data.

43 Claims, 11 Drawing Sheets



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Mission

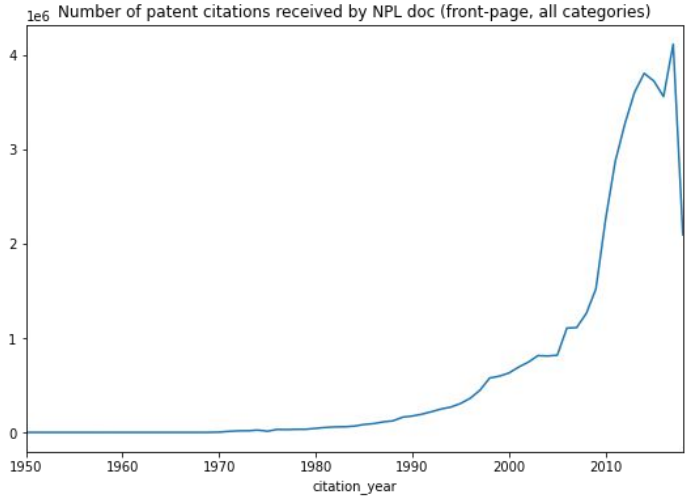
Build a community driven comprehensive patent citations dataset

- Worldwide
- Front page & In-text
- All categories of NPL

→ *One-stop-shop by and for the community + we take care of data engineering*

Motivations

- Embed patents in the innovation system: science, *open knowledge*, IP institutions & competition
- Improve knowledge flows measurement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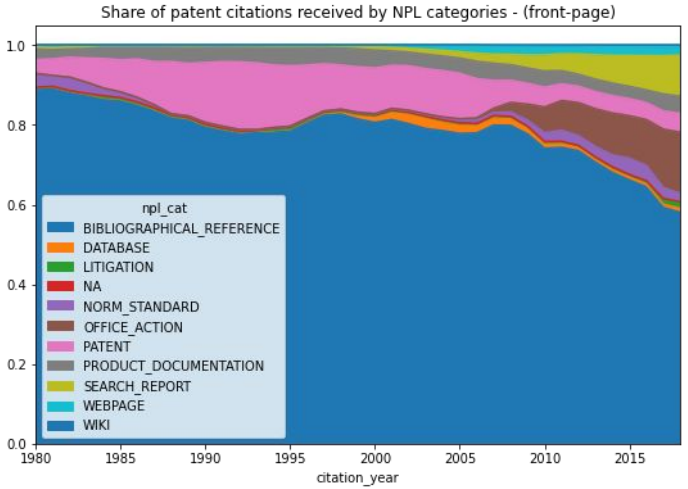
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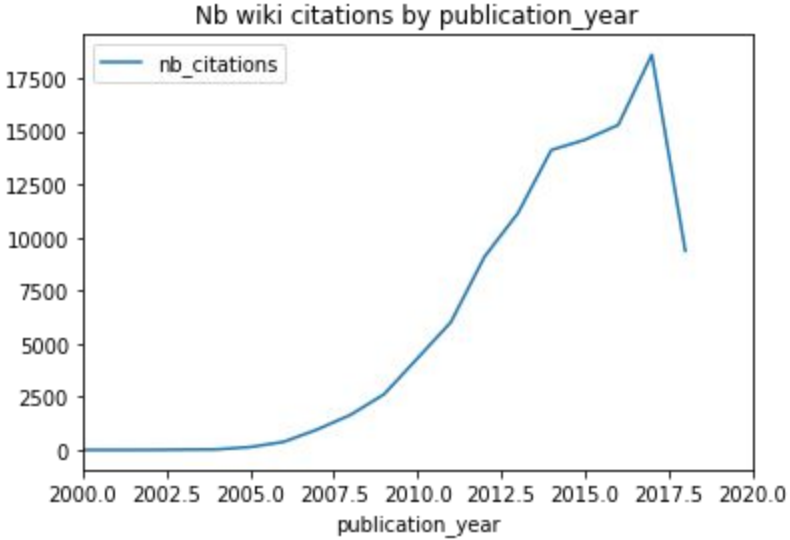
SEARCH_REPORT
WEBPAGE
WIKI



Graph

- Nb wiki nodes: 70,052
- Nb patent nodes: 64,224
- Nb edges: 108,475

Previous work

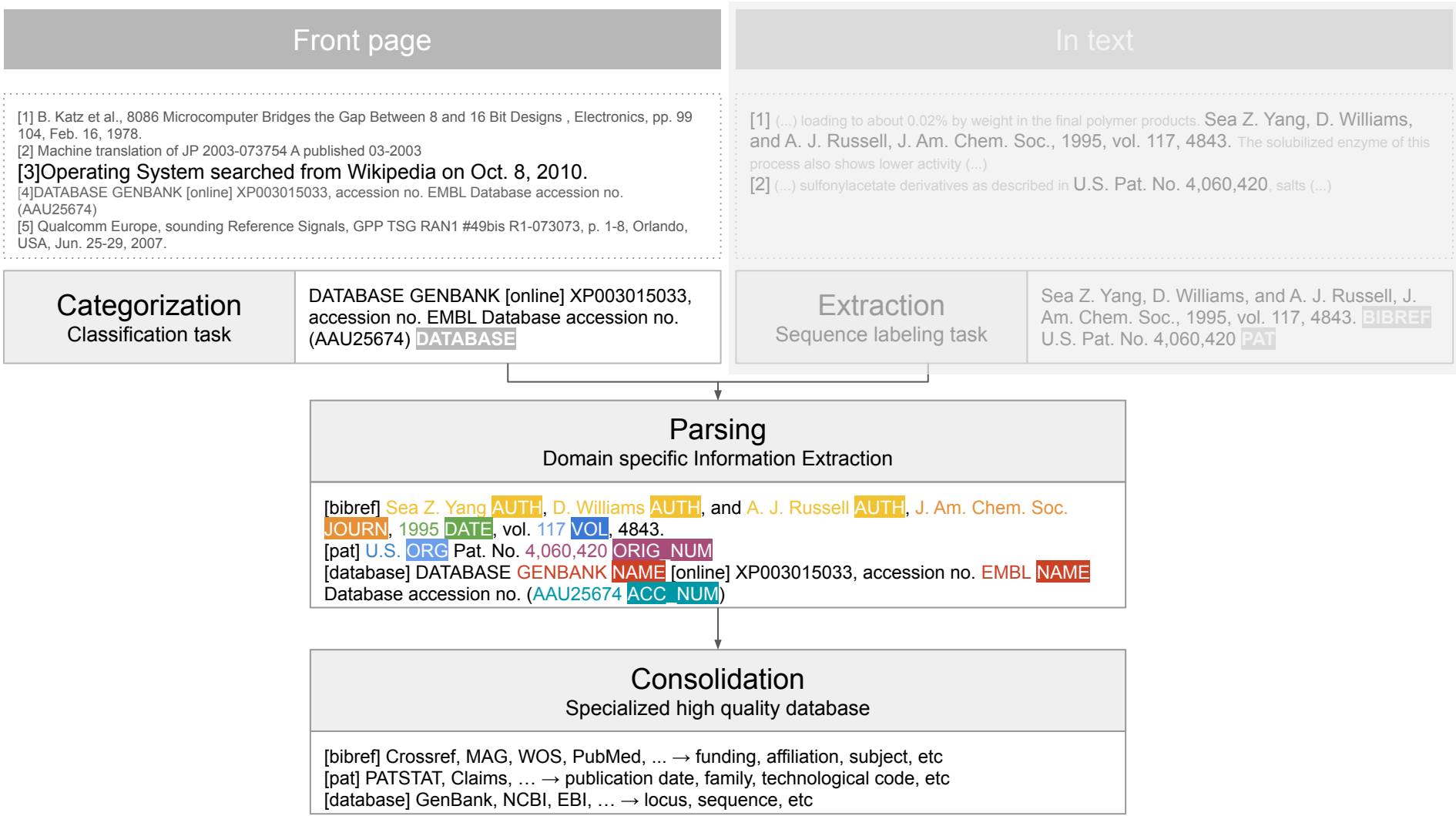
- Patents and scientific citations
  - Jefferson et al (2018)
  - Marx and Fuegi (2020a,b)
  - Bryan et al (2020)
- Natural Language Processing & citations extraction/parsing
  - Galibert et al (2010)
  - Verberne et al (2018)
  - Grobid (2008-2020)

→ WIKI not addressed

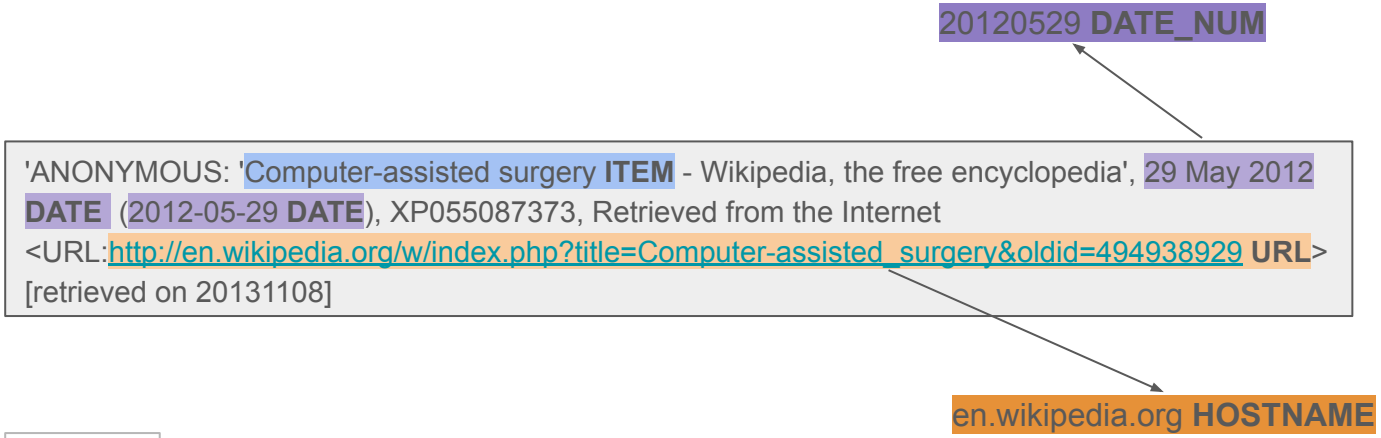
Methodology

Bridging the gap

- Syndicate field expertise
- Domain specific information extraction models
- Data enrichment


Front page
In text
[1] B. Katz et al., 8086 Microcomputer Bridges the Gap Between 8 and 16 Bit Designs , Electronics, pp. 99 104, Feb. 16, 1978.
[2] Machine translation of JP 2003-073754 A published 03-2003
[3]Operating System searched from Wikipedia on Oct. 8, 2010.
[4]DATABASE GENBANK [online] XP003015033, accession no. EMBL Database accession no. (AAU25674)
[5] Qualcomm Europe, sounding Reference Signals, GPP TSG RAN1 #49bis R1-073073, p. 1-8, Orlando, USA, Jun. 25-29, 2007.
[1] (...) loading to about 0.02% by weight in the final polymer products. Sea Z. Yang, D. Williams, and A. J. Russell, J. Am. Chem. Soc., 1995, vol. 117, 4843. The solubilized enzyme of this process also shows lower activity (...)
[2] (...) sulfonylacetate derivatives as described in U.S. Pat. No. 4,060,420, salts (...)
Categorization
Classification task
DATABASE GENBANK [online] XP003015033, accession no. EMBL Database accession no. (AAU25674) DATABASE
Extraction
Sequence labeling task
Sea Z. Yang, D. Williams, and A. J. Russell, J. Am. Chem. Soc., 1995, vol. 117, 4843. BIBREF
U.S. Pat. No. 4,060,420 PAT
Parsing
Domain specific Information Extraction
[bibref] Sea Z. Yang AUTH, D. Williams AUTH, and A. J. Russell AUTH, J. Am. Chem. Soc. JOURN, 1995 DATE, vol. 117 VOL, 4843.
[pat] U.S. ORG Pat. No. 4,060,420 ORIG_NUM
[database] DATABASE GENBANK NAME [online] XP003015033, accession no. EMBL NAME Database accession no. (AAU25674 ACC_NUM)
Consolidation
Specialized high quality database
[bibref] Crossref, MAG, WOS, PubMed, ... → funding, affiliation, subject, etc
[pat] PATSTAT, Claims, … → publication date, family, technological code, etc
[database] GenBank, NCBI, EBI, … → locus, sequence, etc

Domain specific information extraction - WIKI



Regex URL

NER ITEM, DATE (F-score resp. 85% and 94%)

Results

- In-text
  - Coverage: worldwide
  - Categorize: 10 categories, f1:.86
  - Parse: already 4 category specific information extraction models
  - Consolidate: 40% bibliographical references enriched with Crossref
- Front-page
  - Coverage: US all time
  - Extract: bibliographical references & patents, f1: .69 & .89
  - Parse: both categories
  - Consolidate: bibliographical references enriched with Crossref and patents enriched with PATSTAT/Claims

Front page

	Categorization	Parsing	Consolidation
Bibliographical reference	p: .84 | r: .92 | f: .87	a: [.77-.92][| no DOI]	Crossref: 40%
Office action	p: .89 | r: .93 | f: .90		
Patent	p: .78 | r: .89 | f: .83		
Search report	p: .96 | r: .87 | f: .91		
Norm Standard	p: .87 | r: .71 | f: .78	p:[.94-.99]| r:[.94-.100]| f:[.95-.99]	Dev - help welcome
Product documentation	p: .66 | r: .62 | f: .64		
Webpage	p: .57 | r: .50 | f: .53		
Database	p: .94 | r: .88 | f: .90	p:[.91-.95]| r:[.90-.92]| f:[.91-.93]	Dev - help welcome
Litigation	p: .93 | r: .84 | f: .88		
Wiki	p: - | r: - | f: -	p:[.92-.96]| r:[.92-.98]| f:[.92-.97]	Dev - help welcome

a=accuracy | p = precision | r = recall | f = f1-score

In-text

	Extraction	Parsing	Consolidation
Bibliographical reference	p: .80 | r: .60 | f: .69 [ex-post]	a: [.77-.92][| no DOI]	Crossref
Patent	p: .97| r: .82 | f: .89	a: [.96-98]	PATSTAT/Claims

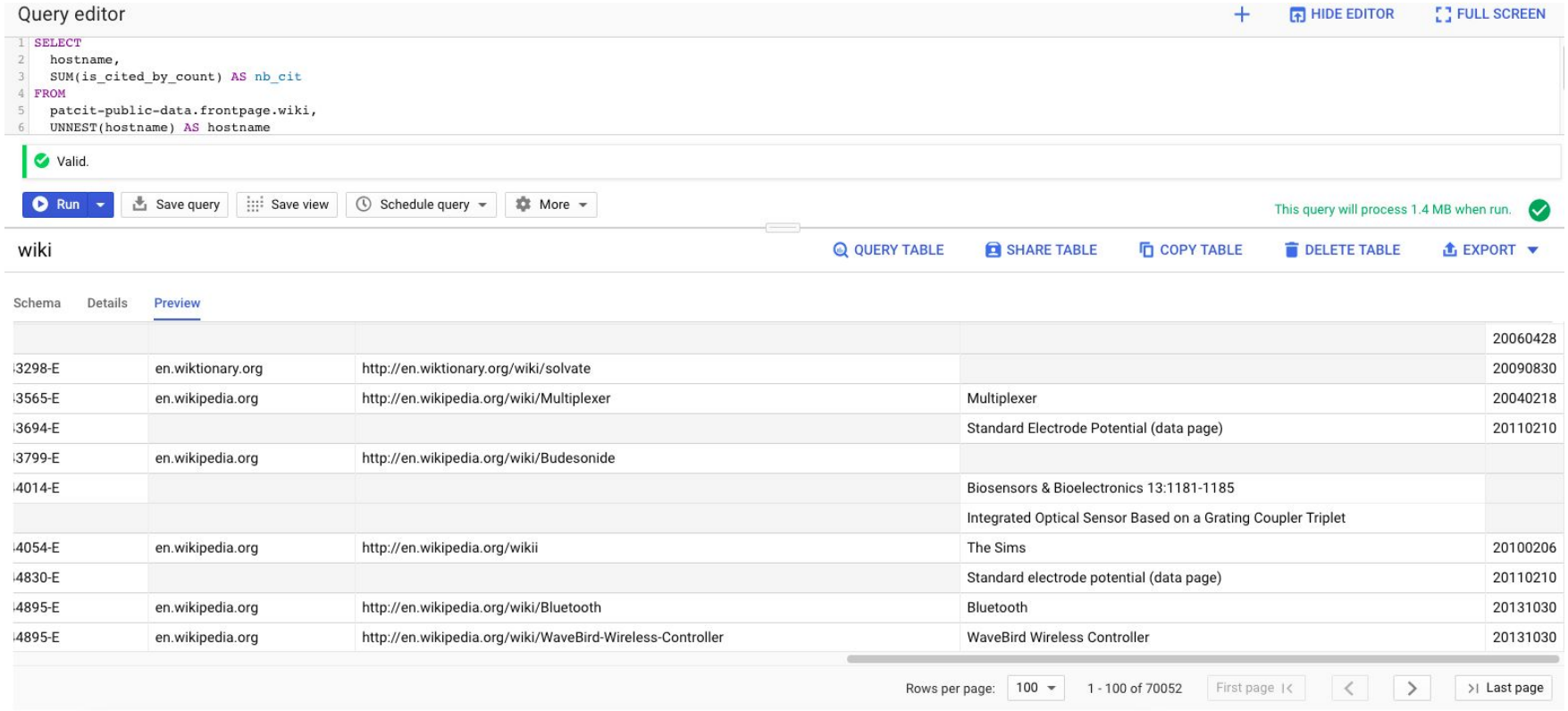
p = precision | r = recall | f = f1-score
Ex-post: we apply a classifier on top of Grobid extraction model to improve the precision. Ex ante p: .41, r: .64, f: .51

Data

FAIR

- Find
  - Zenodo [dump + data versioning]
  - BigQuery [interactive + latest]
- Access
  - Documentation website
  - Issues/requests/etc on GitHub
- Interoperability
  - [bibref] DOI, PMID, PMCID
  - [patent] publication number
  - [database] accession number
  - [wiki] url
- Reproduce
  - GitHub
  - DVC (model + training data)

Time to play!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UNNEST(hostname) AS hostname
Valid.
Run
Save query
Save view
Schedule query
More
This query will process 1.4 MB when run.
wiki
QUERY TABLE
SHARE TABLE
COPY TABLE
DELETE TABLE
EXPORT
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Preview
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Thank You!

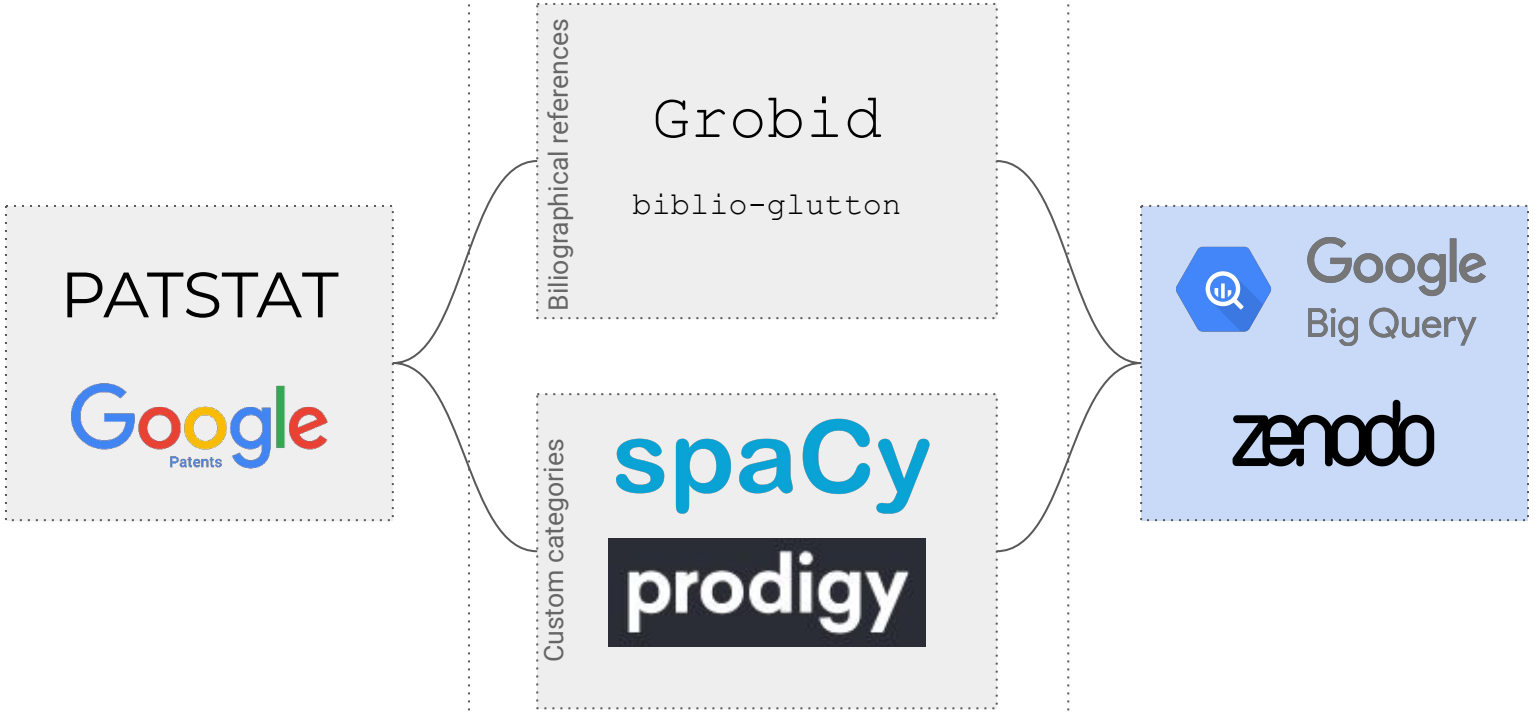
NPL categories (1/2)

Category	Group	Example
Bibliographical reference	Science	B. Katz et al., 8086 Microcomputer Bridges the Gap Between 8 and 16 Bit Designs , Electronics, pp. 99 104, Feb. 16, 1978.
Database	Science	DATABASE GENBANK [online] XP003015033, accession no. EMBL Database accession no. (AAU25674)
Norm Standard	IO/Competion	Qualcomm Europe, sounding Reference Signals, GPP TSG RAN1 #49bis R1-073073, p. 1-8, Orlando, USA, Jun. 25-29, 2007.
Product documentation	IO/Competion	Brochure, Roadtec SP 100 Gravity Feed Paver (undated).
Litigation	IO/Competion	Suggestion for Interference filed in connection with U.S. Appl. No. 10/689,866 on May 11, 2010.

NPL categories (2/2)

Category	Group	Example
Wiki	Open knowledge	Operating System searched from Wikipedia on Oct. 8, 2010.
Webpage	Open knowledge	'P2P Internet', halfbakery, http://www.halfbakery.com/idea/P2P-20Internet#10952502800, 3 pages.
Search report	IP institutions	International Search report and Written Opinion for PCT Application PCT/US2010/043935 Search report dated Nov. 16, 2010.
Office action	IP institutions	First Office Action issued by the State Intellectual Property Office of People's Republic of China in corresponding CN Application No. 201080037669.8, dated Nov. 18, 2013.
Patent		Machine translation of JP 2003-073754 A published 03-2003

Technical stack



Named Entity Recognition - Review

TODO

Vocabulary

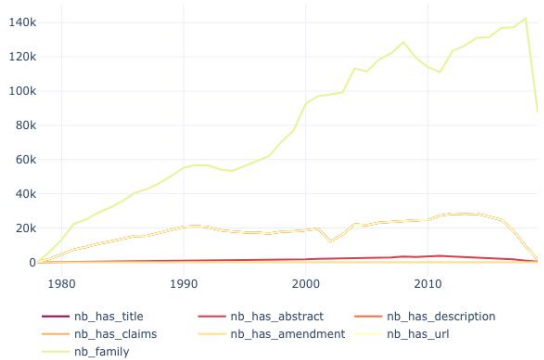
Accuracy - Informally, accuracy is the fraction of predictions our model got right. Formally, accuracy has the following definition: *Accuracy = # correct predictions/ # of predictions*.

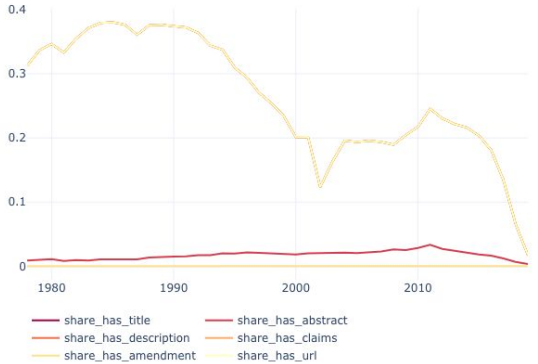
Precision - Informally, precision attempts to answer the following question: "What proportion of positive identifications was actually correct?". Formally, precision has the following definition: *Precision = # True Positives/ (# True Positives + # False Positives)*.

Recall - Informally, recall attempts to answer the following question: “What proportion of actual positives was identified correctly?”. Formally, recall has the following definition: *Recall = # True Positives / (# True Positives + # False Negatives)*

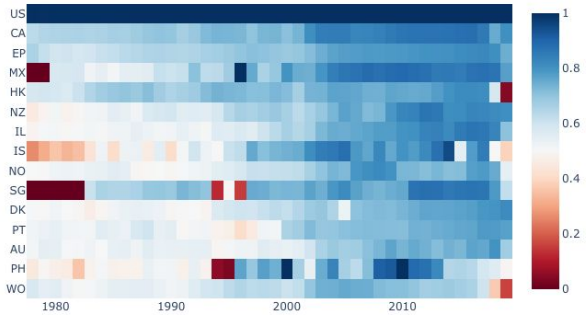
EPO full-text

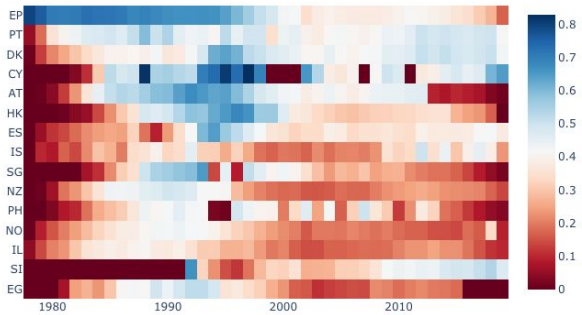
Number and share of EPO patent families with full-text data coverage *in english*





USPTO and EPO full-text patent description data coverage





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