USPTO PatentsView: a disambiguated resource for policy research

Identifiers and Intellectual Property Workshop
OECD – ORCID – CrossRef

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June 22, 2017

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Agenda

- Overview
- Data
- Disambiguation
- Analysis

Overview

USPTO PatentsView (www.patentview.org)

- PatentsView is a patent data visualization and analysis platform intended to increase the value, utility, and transparency of US patent data. The initiative is supported by the Office of Chief Economist in the US Patent & Trademark Office (USPTO)
- Over 40 years of U.S. patent data – parsed, cleaned, processed, disambiguated and visualized
- Multiple tools: data visualizations, API, relational databases, search index, Query Builder
- Advanced computational techniques for inventor, assignee and location disambiguation
- Record linkages and non-USPTO patents-related data sources (e.g. government-funded awards)

Platform

PV Database

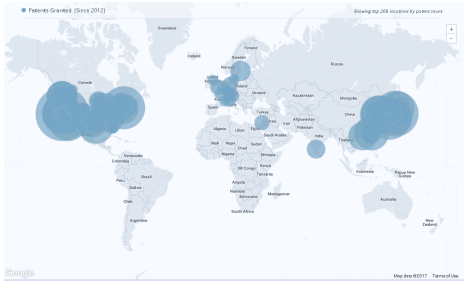
API

POST /api/patents/query

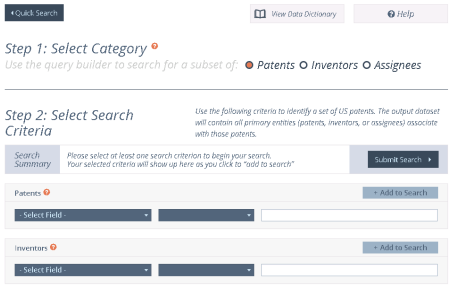
Bulk Downloads

- Inventors
- Assignees
- CPC
- NBER
- Etc.

Visualizations



Query Builder

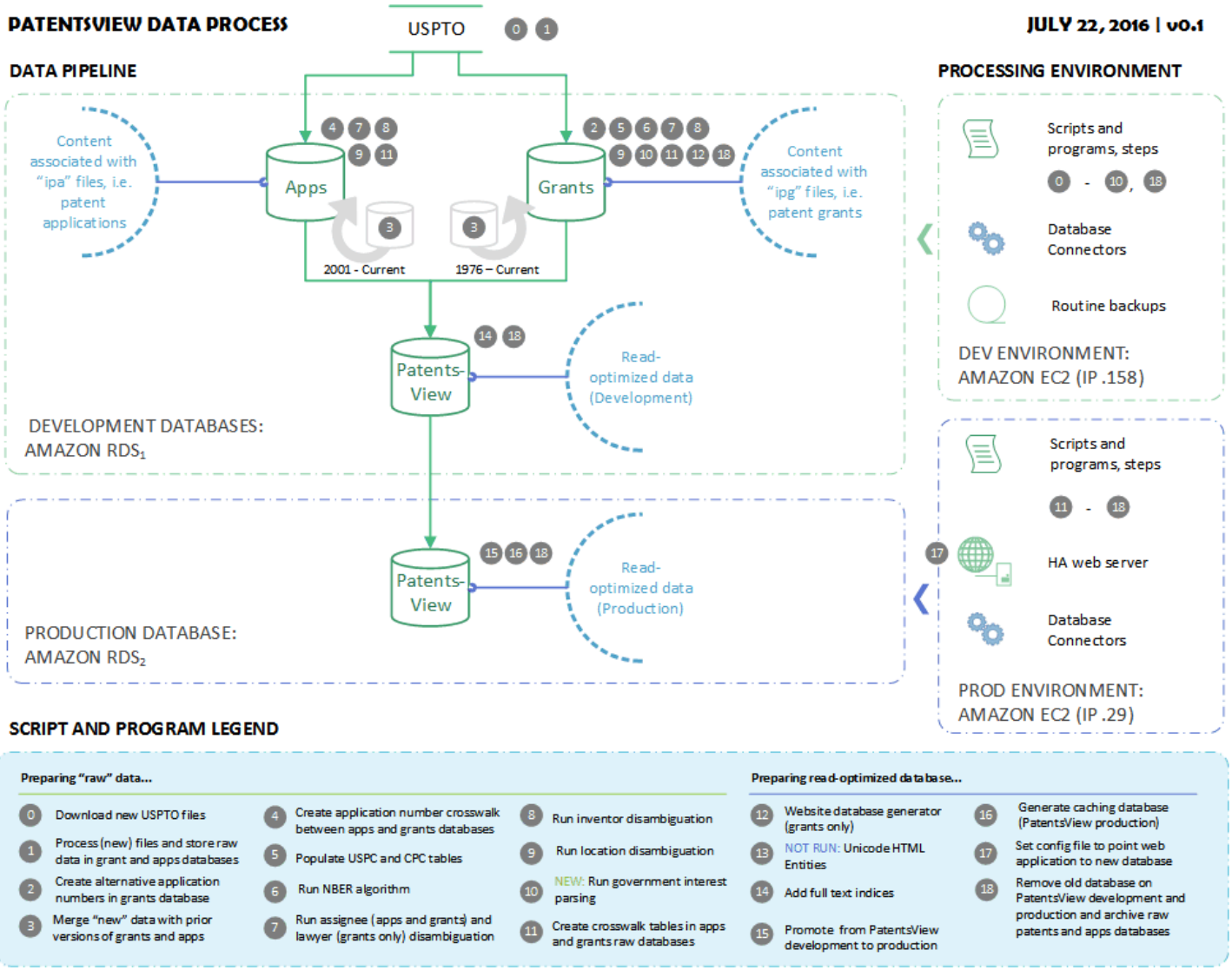


Code Snippets

```
import requests, json
import codecs
import time
from unidecode import unidecode

# Defining function using Google API to fetch Geo info based on inputs
def _whois_gmap(**kwargs):
    kwargs['sensor'] = 'false'
    url = 'http://maps.googleapis.com/maps/api/geocode/json'
    r = requests.get(url, params=kwargs)
    return json.loads(r.text)

punctuation = "( + ) [ ? : ! . , ] * # % ` ' / _ -".split()
punctuation.append("'")


fd = 'H:\share\Science Policy Portfolio\PatentsView III\Location Disambiguation QA//'.replace("\\","/")

mydb = sqlite3.connect(fd+'geolocation_new.sqlite3')

def re_in(expr, item):
    reg = re.compile(expr, re.I)
    return reg.search(item) is not None
```

Data

PatentsView data process



Summary statistics

- 6,215,171 granted patents (1976-2017)
- 14,536,617 (raw) inventors
- 5,442,930 (raw) assignees
- 19,979,547 (raw) locations
- 86,184,397 U.S. patent citations
- 31,735,419 CPC classes
- 124,765 patents with government interest statement
- Etc.

Disambiguation

Disambiguated fields

- Inventors
- Assignees
- Locations
- Lawyers

USPTO Inventor Disambiguation Workshop, 2015

- Original disambiguation algorithm by UC Berkeley based on Jaro-Winkler distance (Li et al., 2014)
- 7 research teams from the United States, Europe, Australia, and China
- Evaluation strategy based on the training ("gold standard") data shared by Manuel Trajtenberg (2009), Ivan Png (2016), and Pierre Azoulay (2012)
- UMass Amherst is the winner with a hierarchical coreferencing algorithm (F1 score=0.98)

* More information at www.patentsview.org/workshop

Results

Table 2. Disambiguated inventor cluster size in the PatentsView databases.

	Average inventor cluster size	Minimum cluster size	Maximum cluster size
Before workshop	3.4686	1	4,723
After workshop	4.5037	1	4,758

Table 3. Disambiguation of eight National Hall of Fame inventors.

	Last Name	First Name	# of patents
Before workshop	Arnold	Frances	1
	Arnold	Frances H.	42
	Arnold	Frances T.	1
	Bowerman	William J.	7
	Boykin	Otis F.	3
	DiMarchi	Richard D.	65
	DiMarchi	Richard D.	1
	Dresselhaus	Mildred	4
	Dresselhaus	Mildred S.	10
	Gadgil	Ashok	6
	Gadgil	Ashok J.	8
	Hull	Charles W.	76
	Hull	Charles W.	3
	Whitfield	Willis J.	1
After workshop	Arnold	Frances H.	48
	Bowerman	William J.	7
	Boykin	Otis F.	3
	DiMarchi	Richard D.	85
	Dresselhaus	Mildred S.	15
	Gadgil	Ashok J.	14
	Hull	Charles W.	78
	Hull	Charles W.	1
	Whitfield	Willis J.	1

14,536,617 raw inventors

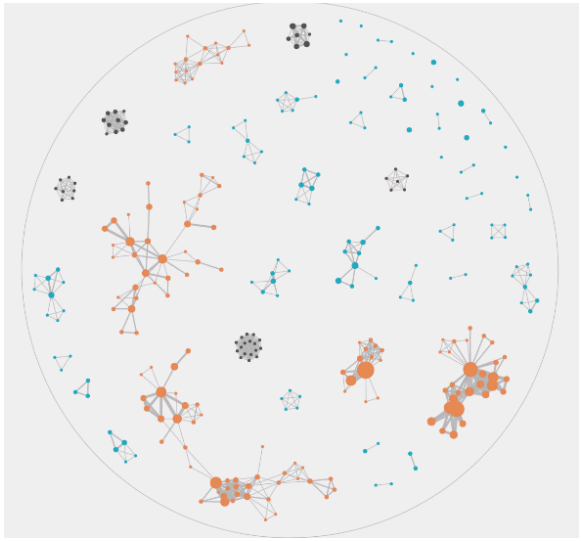
3,414,473 disambiguated inventors

Analysis

Companies innovate differently (Scientific American, 2015)

Tesla

Intrexon

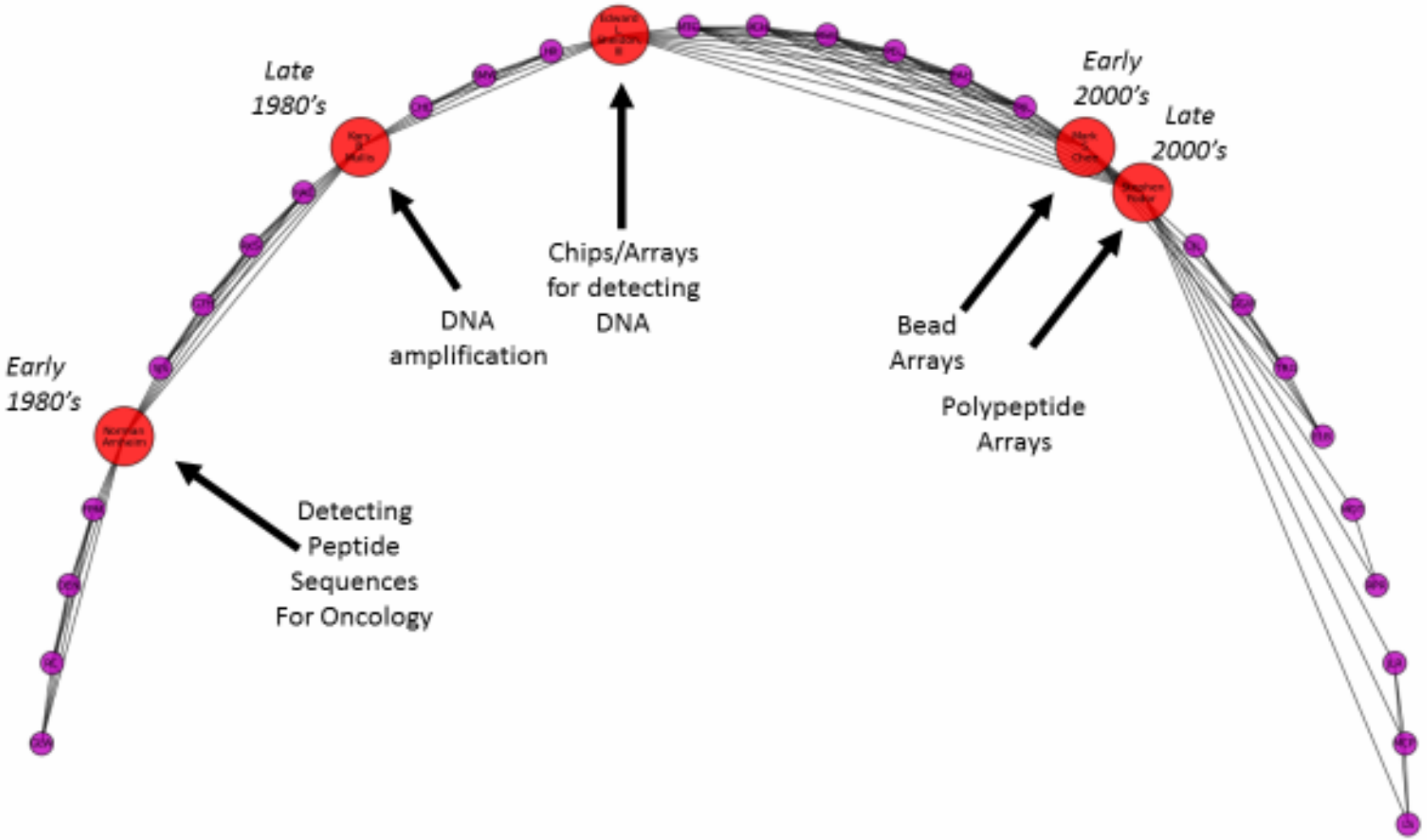


Facebook

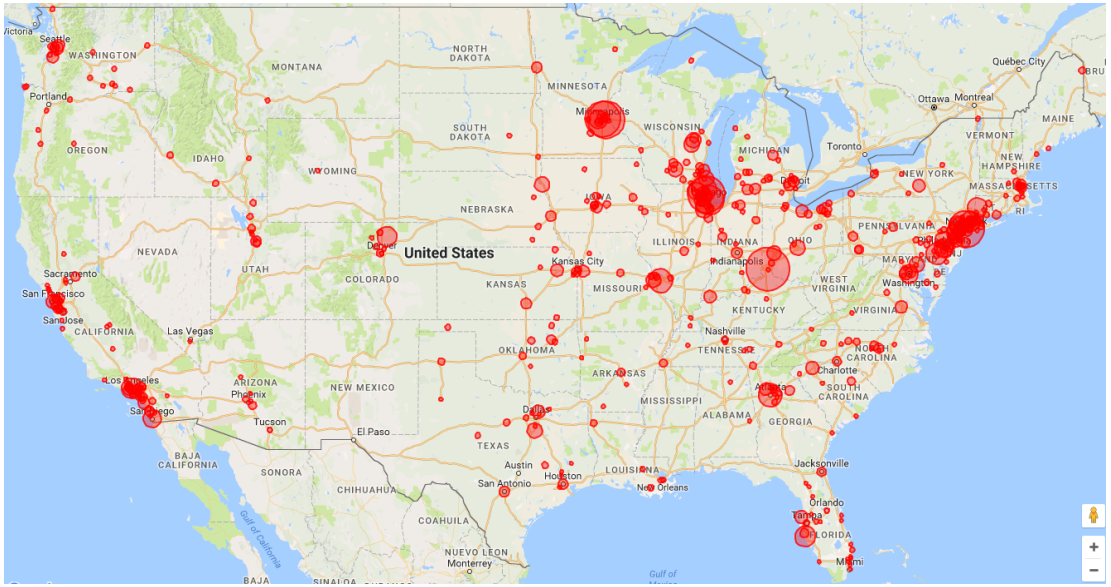
Credit: PERISCOPIC

Cancer Moonshot data

Co-inventor networks for patents with high citation network pagerank



Food safety patents



Government-funded patents

Agency	No. of patents
Army	3
Department of Agriculture	14
Department of Energy	3
National Institutes of Health	9
National Science Foundation	4
Centers for Disease Control and Prevention	1
U.S. Government (as a whole)	5
Total	39

Questions?

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