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Employing APIs to create powerful data visualizations

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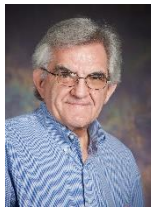
Presenters

Holly J. Falk-Krzesinski, PhD

Vice President, Research Intelligence



Bill Mischo

Berthold Family Professor in Information Discovery, University of Illinois at Urbana-Champaign Library

Matt DiRenzo

Elsevier, Product Manager

Overview

Matt DiRenzo presents:

- Introducing Elsevier API product team
- Why we use the APIs
- Typical & emerging use cases

Bill Mischo presents

- Use of the Scopus APIs at Illinois
- Producing interactive research impact visualizations
- Live demo

Q&A

Elsevier API Platform

Scopus APIs

Matthew DiRenzo, Product Manager
05/07/19

The Elsevier API Product Team

Product Development

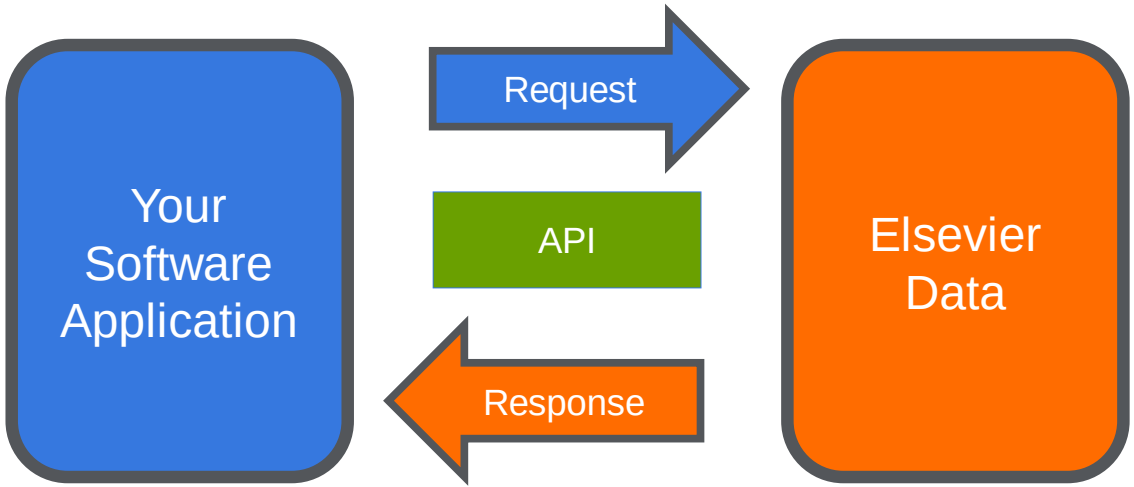
Matthew DiRenzo
Product Manager

Product Support

David Santucci
Integration Support Coordinator

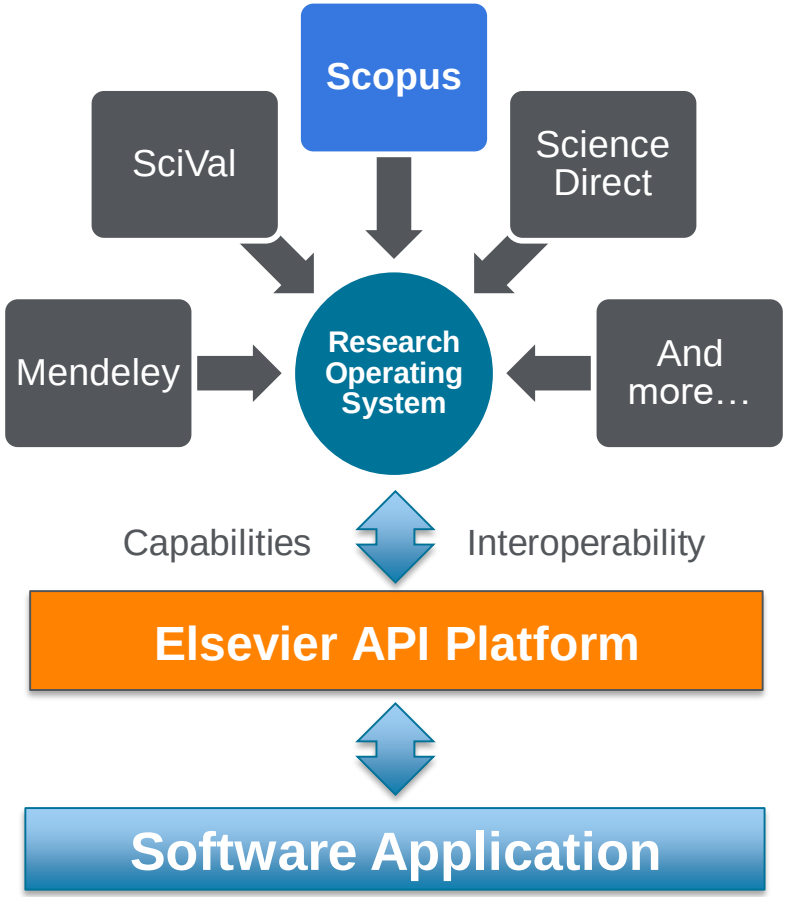
Why APIs?

Elsevier's APIs provide real-time programmatic access to researchers, developers, and partners who wish to integrate Elsevier's data and analytics into their own applications.



Data exchange occurs via the API, which functions as both a machine interface and delivery mechanism. **Requires some technical expertise to implement but allows for easy automation and integration.**

The Elsevier API Platform



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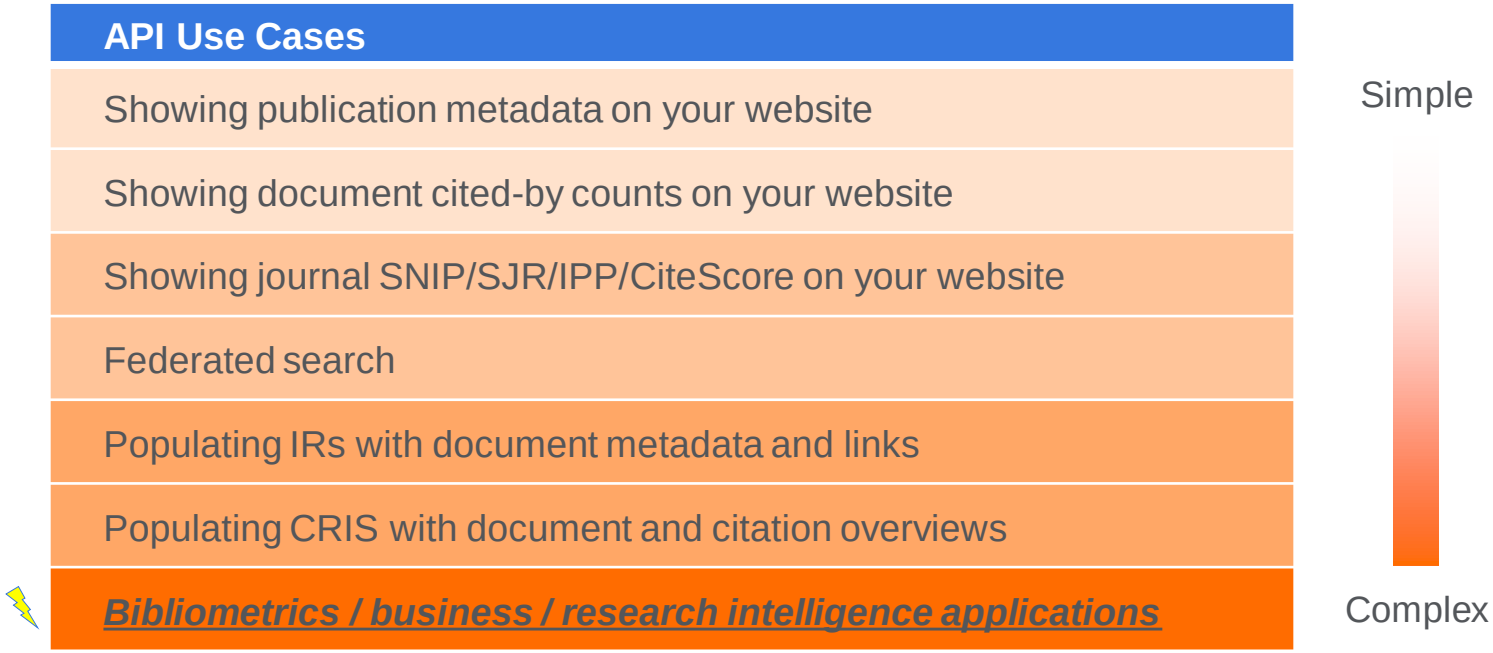
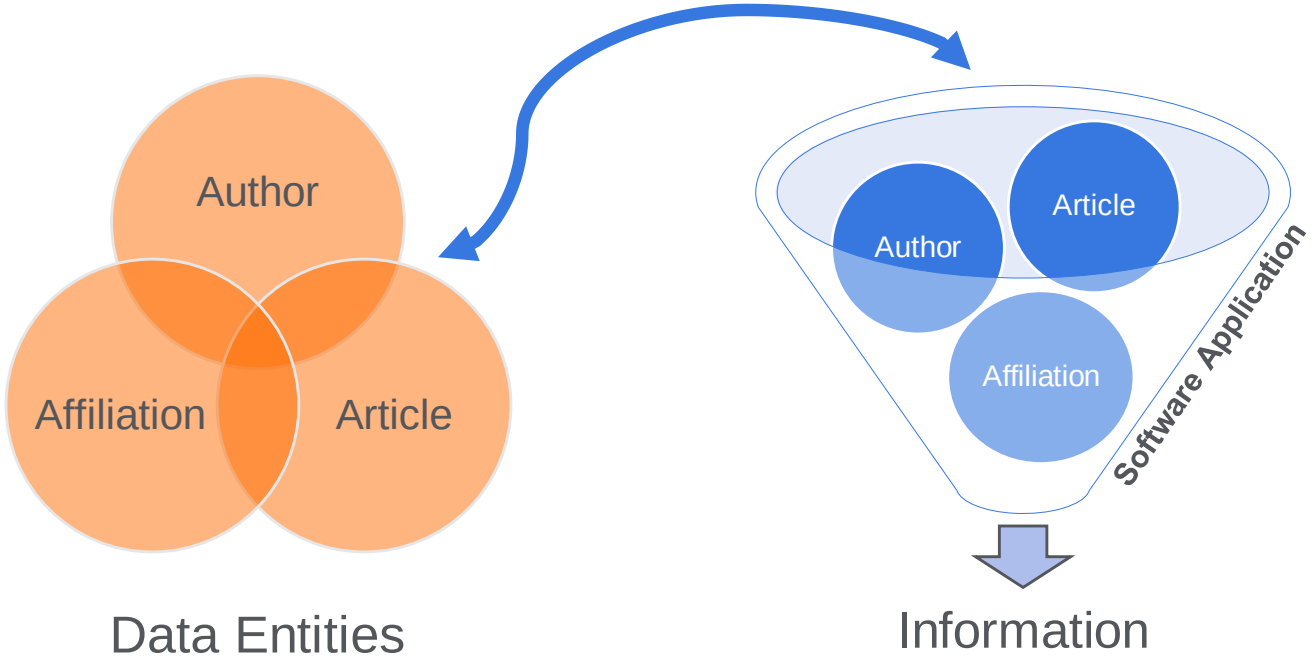
Common Use Cases & Examples



Scopus API Data Model & Workflow

The Elsevier API platform standard workflow involves discovering data entities and processing them to generate insights. Many of the APIs can be used **in conjunction** with each other via common identifiers, e.g. DOI or author ID.



Scopus API Data Model & Workflow

The Scopus APIs are organized according to the following model and heavily emphasize **data linking** and **interoperability**:

Search	Retrieval	Metrics	Source Metadata
• Scopus Search • Author Search • Affiliation Search	• Abstract Retrieval • Author Retrieval • Affiliation Retrieval	• Citation Count • Citation Overview • PlumX Metrics	• Serial Title • Nonserial Title
Search for entities in the Scopus search indices	Retrieve full abstracts and entity profiles	Extract citation data and metrics for various entities	Retrieve source metadata and metrics

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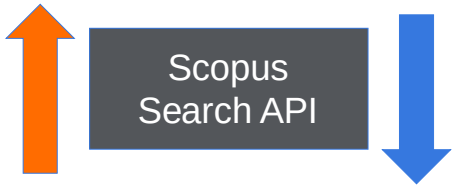
Elsevier RESTful API Basics



Standard HTTP GET Request

```
https://api.elsevier.com/content/search/scopus?query=af-id(60027090)&start=0&count=25&apiKey=d08d0ac7de4f4d31b410a03595e23c92
```

The request consists of the resource URI followed by the request **parameters**.

RESTful JSON Response

```
{
    "search-results": {
        "opensearch:totalResults": "96910",
        "opensearch:startIndex": "0",
        "opensearch:itemsPerPage": "25",
        "opensearch:Query": {
            "@role": "request",
            "@searchTerms": "af-id(60027090)",
            "@startPage": "0"
        },
}
```

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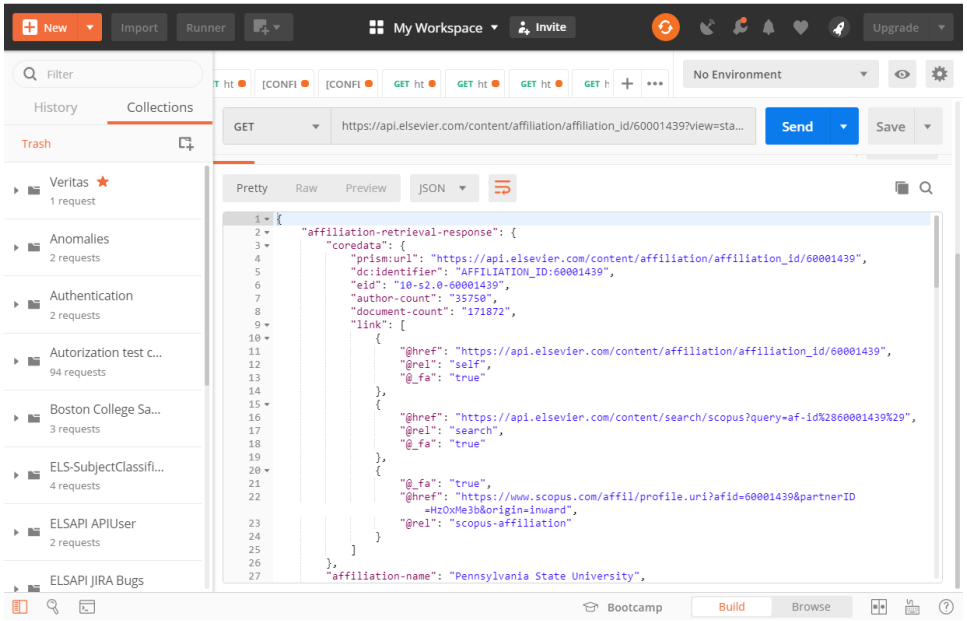
Implementing APIs

Code, e.g. Python 3

```
# Enter API key for this demo (hard coded for sales)
# demoKey = str(input('Enter your API key: '))
demoKey = 'e71bc6b57a2ea03b054ffe59b1a877bc'
token = getAuthToken(demoKey)

apiKey = '&apiKey={!s}'.format(demoKey)
authToken = '&access_token={!s}'.format(token)

# Enter affiliation ID and Scopus subject area.
affiliationID = str(input('Enter your Scopus affiliation ID: '))
subjectChoice = (str(input('Enter a subject area? (Y\\N): '))).lower()

if subjectChoice == 'y':
    subjectArea = str(input('Enter your subject area code: '))
    affiliationID = 'af-id({!s}) and subjarea({!s})'.format(affiliationID, subjectArea)
else:
    affiliationID = 'af-id({!s})'.format(affiliationID)

print('\n-----------------------------------')
print('Retrieving data from Scopus API...')
print('-----------------------------------\n')

# Construct strings for API request.
baseURI = 'https://api.elsevier.com/content/search/author?query='
queryParams = '&sort=document-count&field=surname,given-name,document-count,affiliation-
response = '&httpAccept=application/json'

# Concatenate strings to build API request.
requestURL = baseURI + affiliationID + queryParams + apiKey + response + authToken

# Submit API request and convert response to JSON data structure.
apiRequest = requests.get(requestURL)
apiData = json.loads(apiRequest.text)
```

Tools, e.g. Postman



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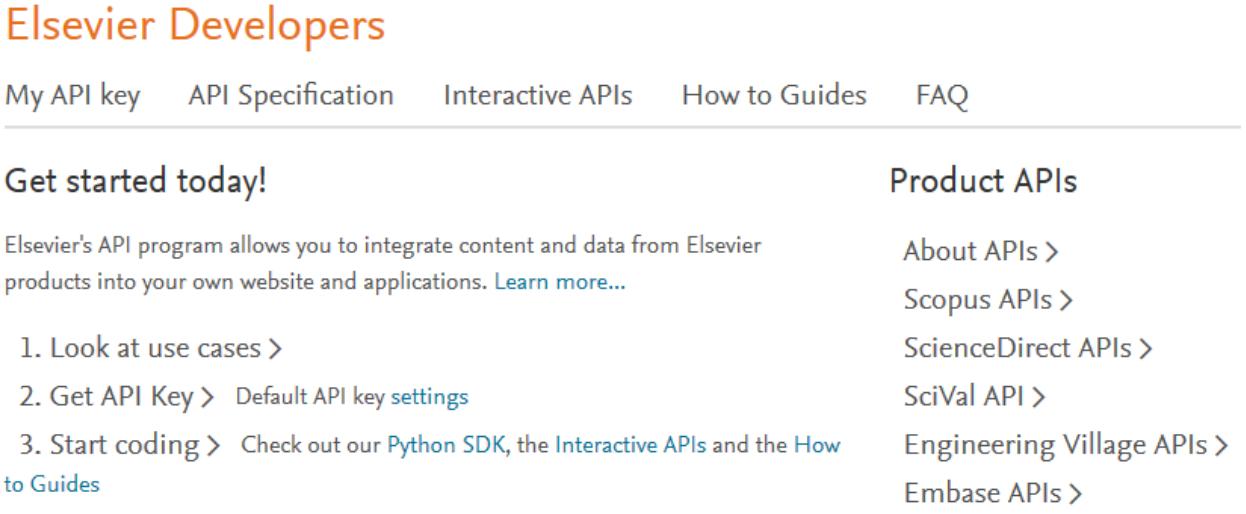
Getting Started – Developer Portal (dev.elsevier.com)



Developer Portal Features
Self-service API Key Creation
Example Use Cases
Use Policies & Service Agreements
Static & Interactive API Documentation
Access to Elsevier's Integration Support Team

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Thank you

Matthew DiRenzo, Product Manager
05/07/19



The Use of the Scopus API in Research Visualizations and Scholarly Communication Studies

Bill Mischo
Grainger Engineering Library Information Center
University of Illinois at Urbana-Champaign

Webinar on the Scopus API
May 7, 2019

ILLINOIS
University Library

Use of the Scopus API at Illinois

- Used in a number of projects:
  - Several collaborations with departmental faculty on text mining projects, including an analysis of 57K articles on Biofuels
  - An analysis of 100 years of publications by UIUC faculty in the Journal of the American Chemical Society
  - Several systematic reviews
  - Search window within our bento-style discovery system -- augmented with Altmetric, Scholix, Unpaywall, and Browzine added links

Scholarly Communication Application

- Using the Scopus API in a study on data reuse of research published in the most cited articles written by Illinois faculty in 2015
  - Pulling out the most cited articles in nine subject areas (Illinois articles, sorted by times cited)
  - Getting author information for each selected article
  - Getting citing articles and author information for each selected article
  - Uses several different API endpoints

Use Case: Research Impact Applications

- Using the Scopus API to produce interactive research impact visualizations
- Working with our new engineering-based medical school, the Carle Illinois College of Medicine
- Cancer Center of Illinois, the CI COM Faculty Mentors Program, and Illinois Health Maker Lab group. NIH grant.
- Using same techniques to generate impact visualizations for other groups, departments, institutes

Research Impact Metrics

- Universities are routinely utilizing research impact assessment measures
- Academic productivity metrics used in P&T processes, external grant funding, & department/college rankings
- Trend for libraries to be cooperatively involved in the gathering and provision of impact data

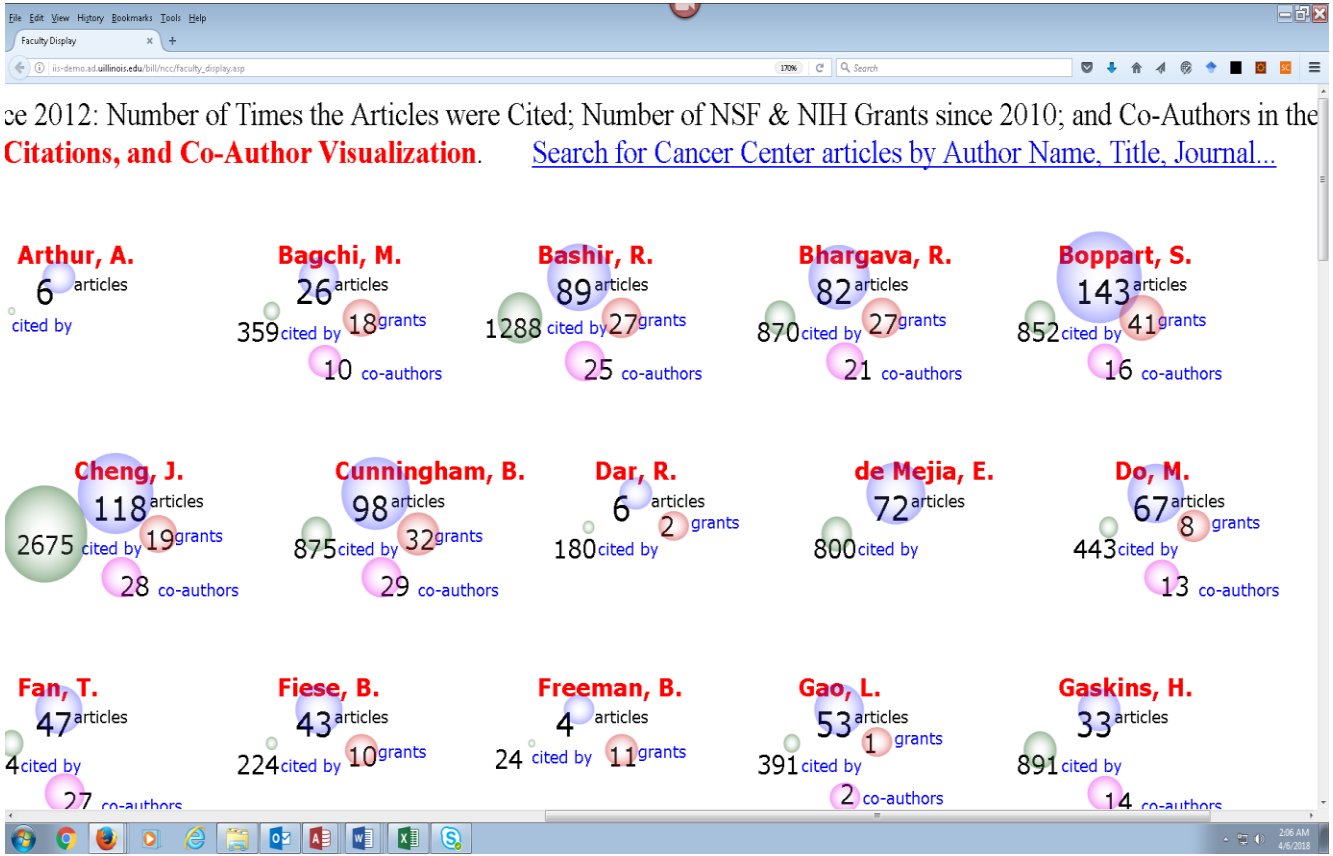
Specifics

- Using server-side scripting language and relational database – XML and JSON parsers
- Begins with a table of names and Scopus ID number(s)
- Configuration file with database name, target articles table, Scopus query, author table, years of coverage, label for display
- Scripts for: researcher article numbers, cited-by numbers, coauthors in cohort, h-index, grants and patents received, and coauthor numbers

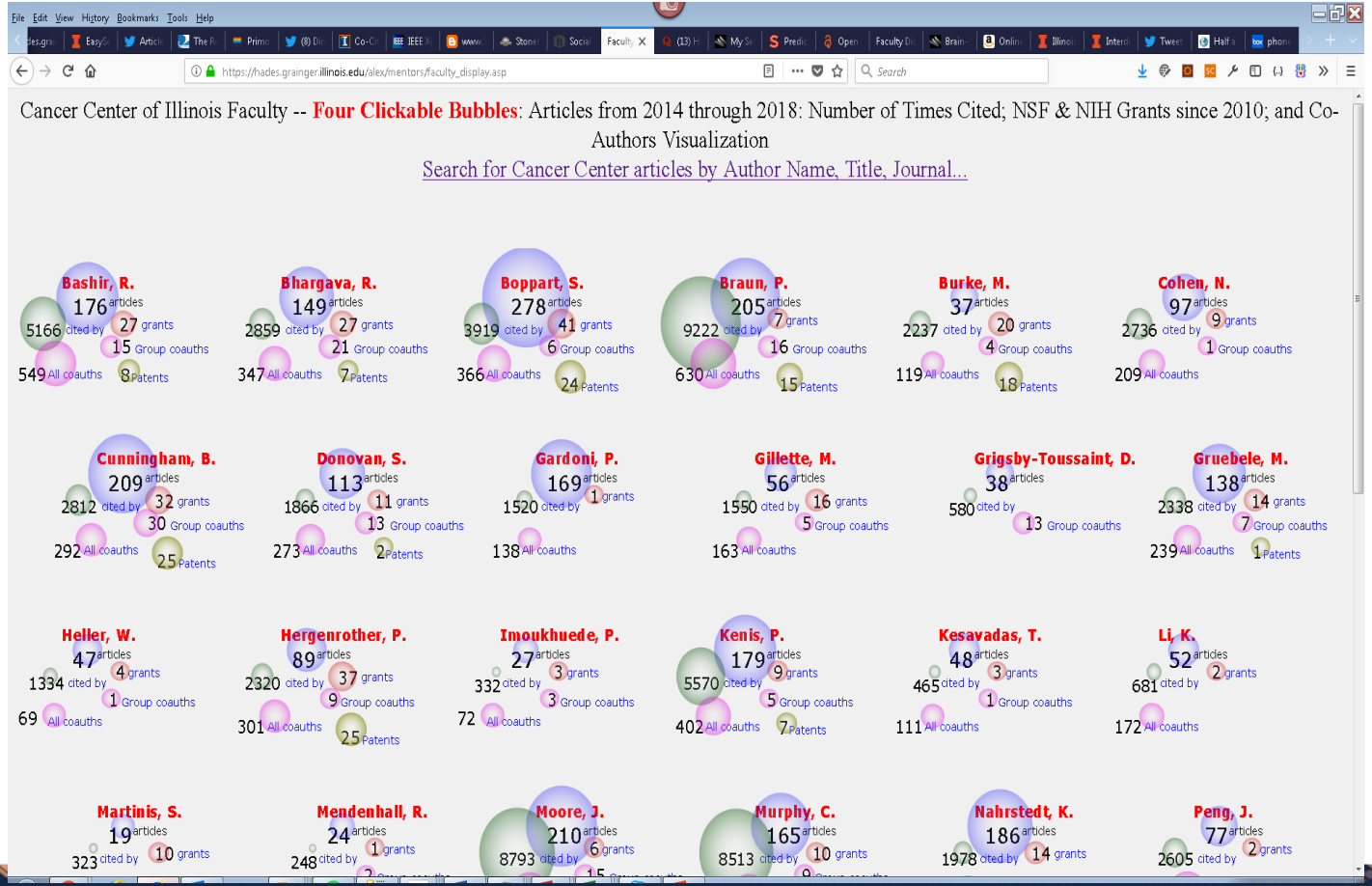
Research Impact Visualizations

- Database-driven, web-based, interactive dashboard that integrates with other APIs
- Scaled and clickable bubbles displaying data for individual researchers
- Clicking on bubbles retrieves bibliographic metadata from the Scopus API, co-author visualization, all coauthors listing, Scopus author profile, grants received from NSF and NIH, and patents

Research Metrics Visualization

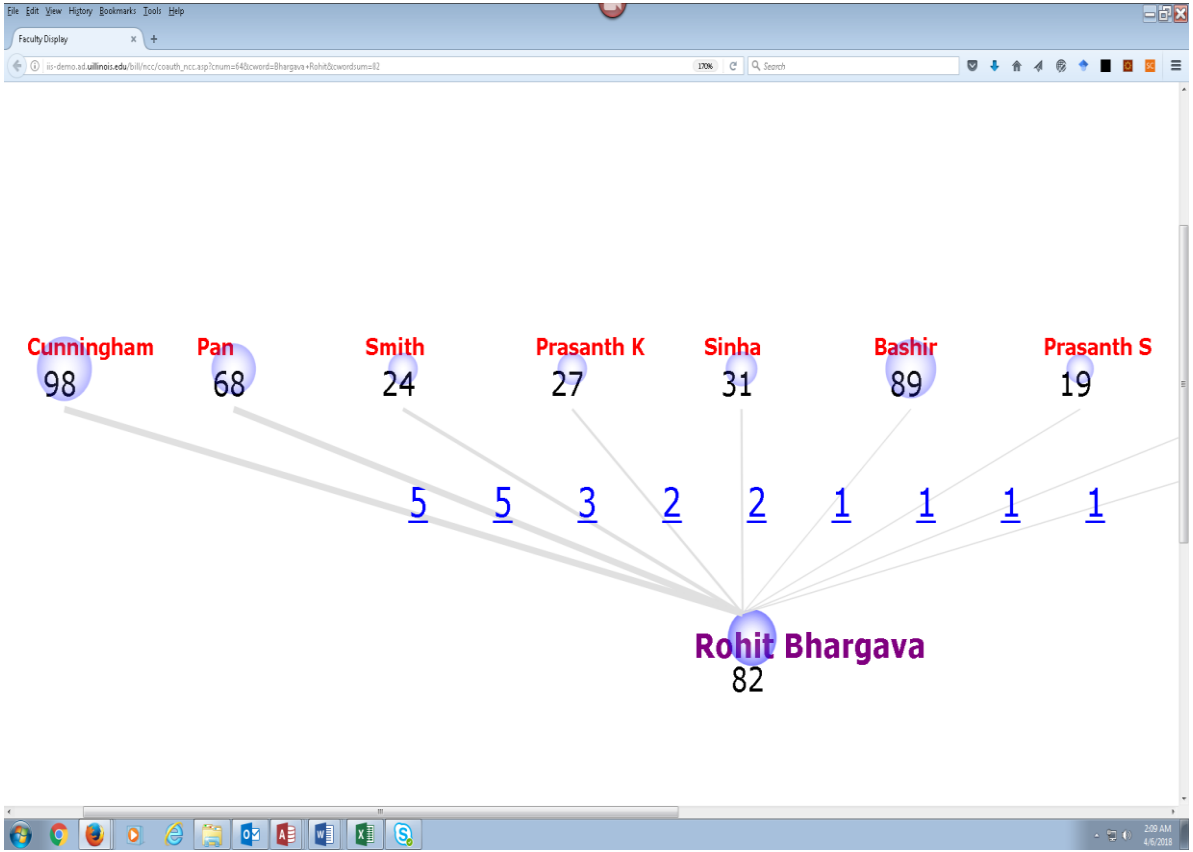


Research Metrics Visualization



Article Display

Co-Author Display with Links to Articles



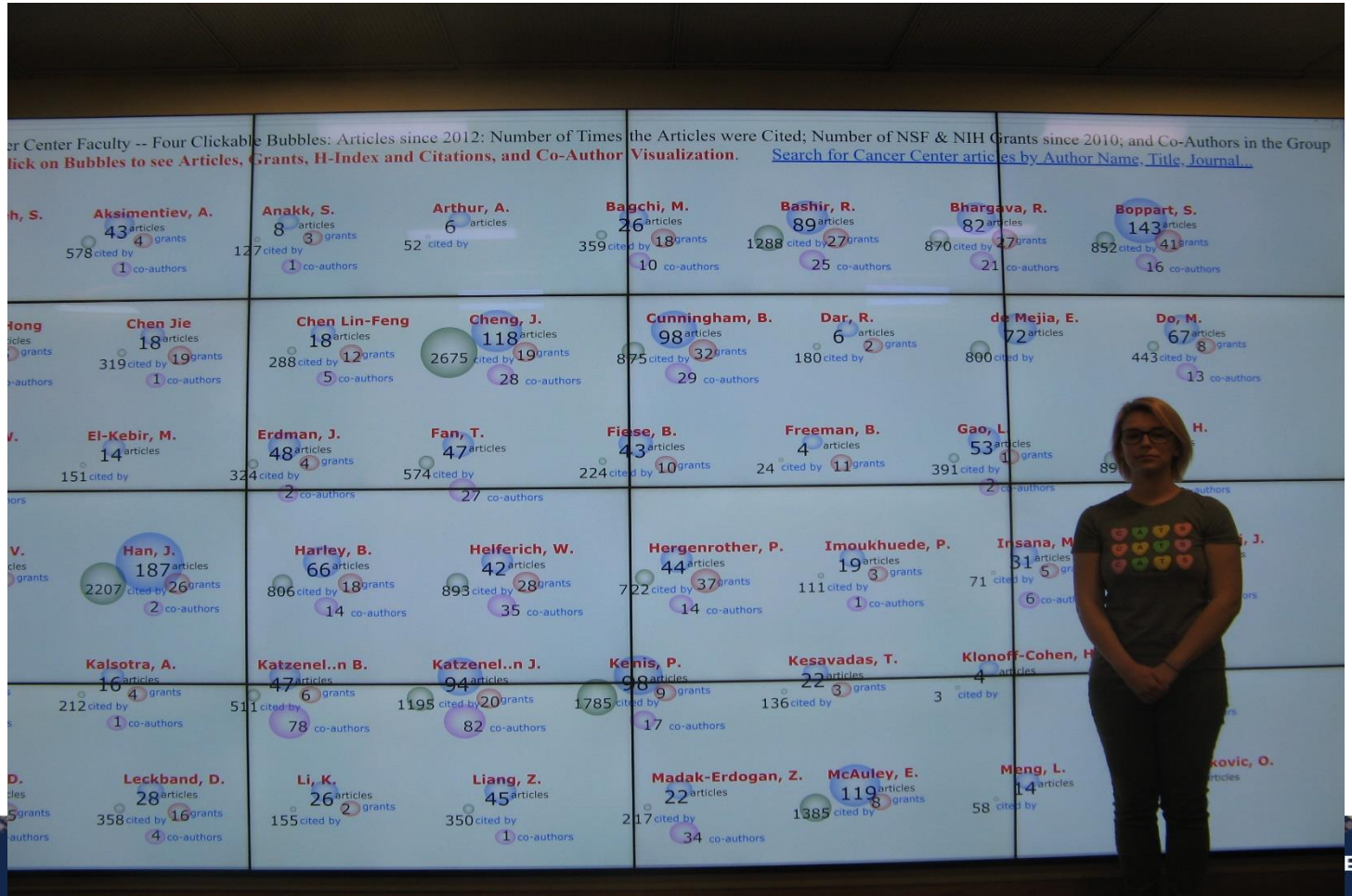
Additional Custom Data

- Perform SQL searches of article titles, abstracts, and keywords for cancer related topics
- Collaborations with other authors affiliated with medical schools or cancer centers
  - Retrieve all co-author detailed affiliations (including department name)
  - SQL search for all articles with medical school/cancer center co-authors
- Unique co-author medical school/cancer center affiliations

Additional Generated Data

- Custom views of co-authored counts by year, publications per year, cited-by counts by year, etc.
- Additional Altmetric data from the API, including PlumX data
- Integration with NSF & NIH grants database, Patents database

Research Metrics Visualization



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