



Employing APIs to create powerful data visualizations



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07.05.2019

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

Elsevier API Platform

Scopus APIs

Matthew DiRenzo, Product Manager
05/07/19



The Elsevier API Product Team

Product Development



Matthew DiRenzo
Product Manager

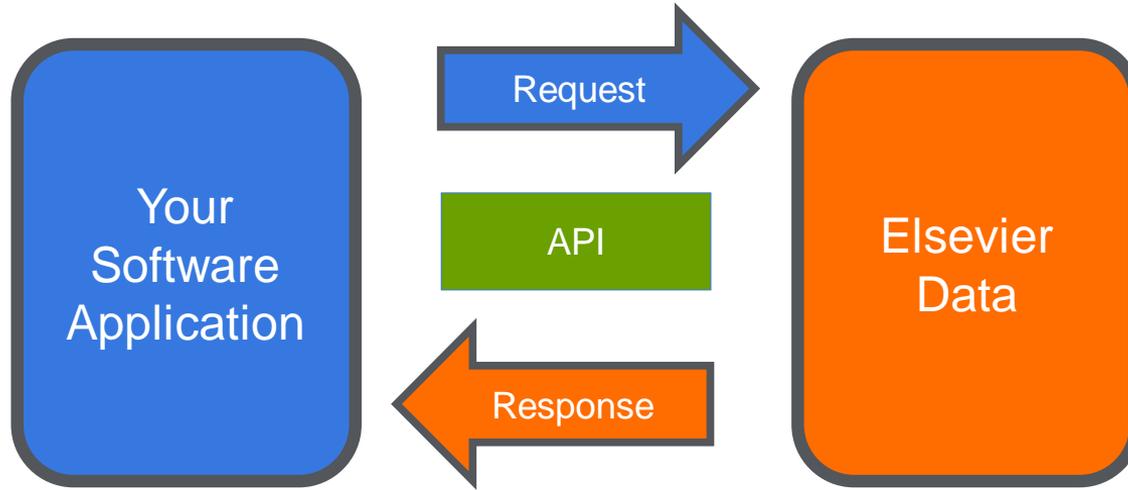
Product Support



David Santucci
Integration Support Coordinator

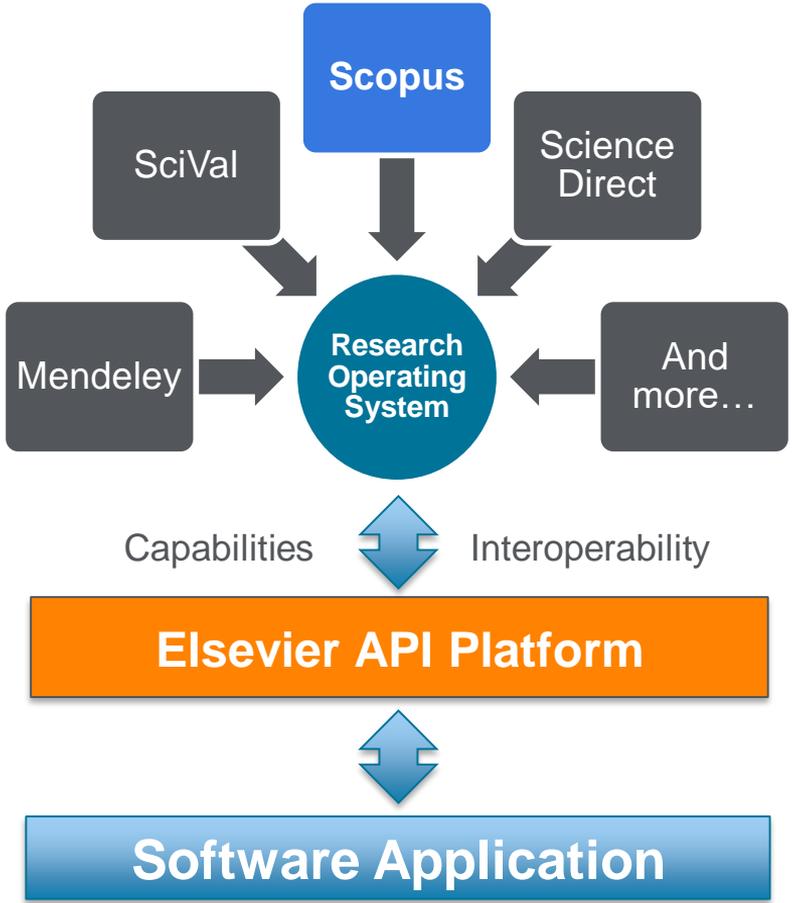
Why APIs?

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

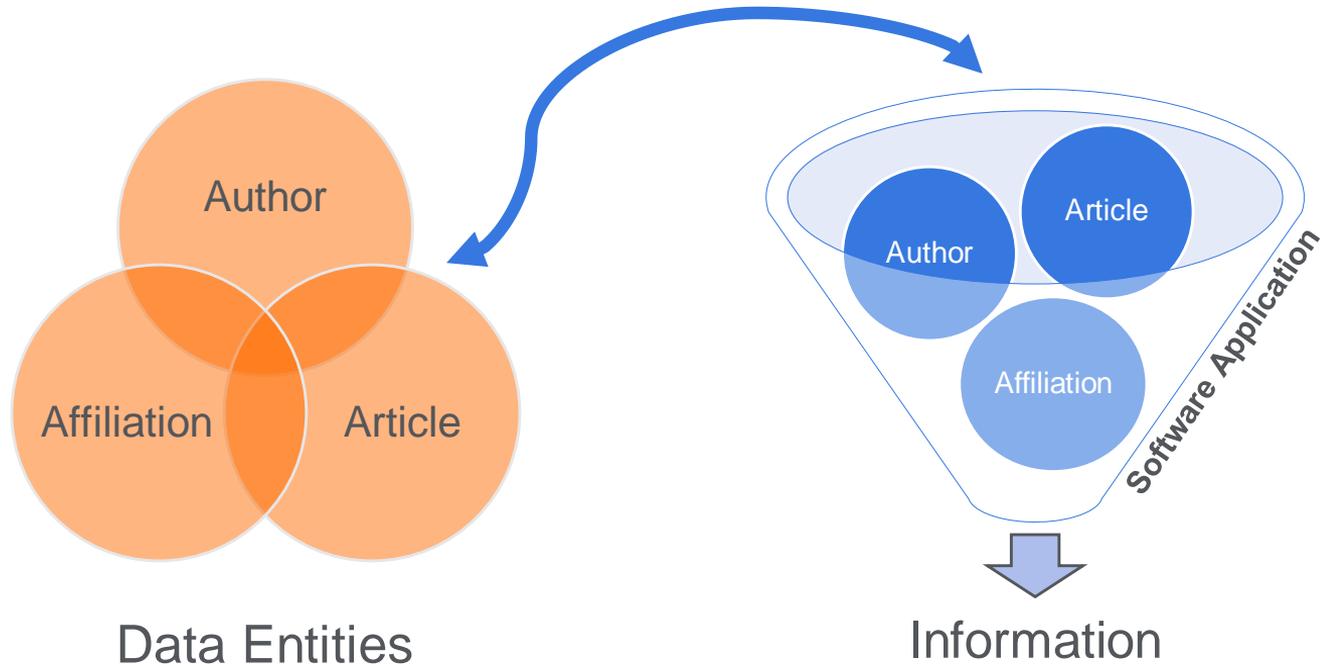


Common Use Cases & Examples

API Use Cases	
Showing publication metadata on your website	Simple
Showing document cited-by counts on your website	
Showing journal SNIP/SJR/IPP/CiteScore on your website	
Federated search	
Populating IRs with document metadata and links	
Populating CRIS with document and citation overviews	
 <u><i>Bibliometrics / business / research intelligence applications</i></u>	Complex

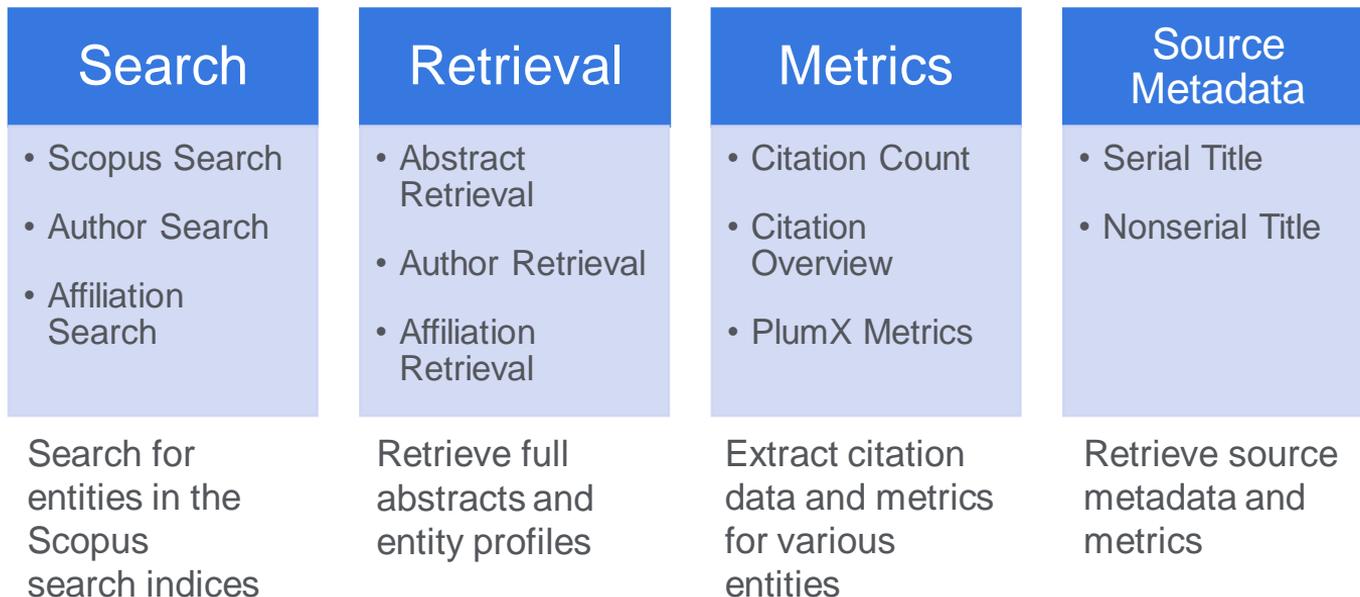
Scopus API Data Model & Workflow

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**:



Elsevier RESTful API Basics



Standard HTTP GET Request

```
https://api.elsevier.com/content/search/scopus?query=af-  
id(60027090)&start=0&count=25&apiKey=d08d0ac7de4f4d31b410a03595e23  
c92
```

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

RESTful JSON Response

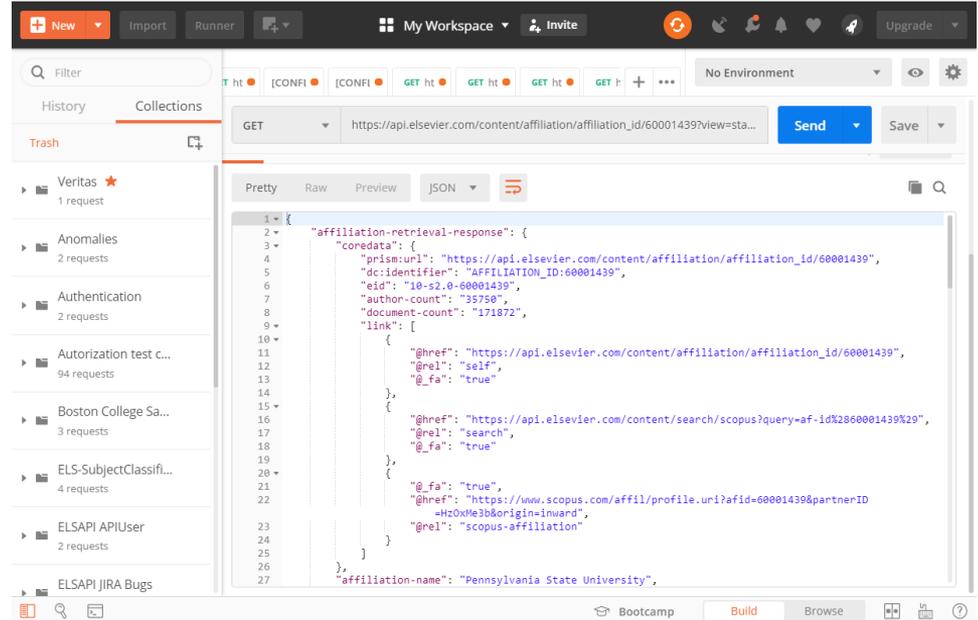
```
{  
  "search-results": {  
    "opensearch:totalResults": "96910",  
    "opensearch:startIndex": "0",  
    "opensearch:itemsPerPage": "25",  
    "opensearch:Query": {  
      "@role": "request",  
      "@searchTerms": "af-id(60027090)",  
      "@startPage": "0"  
    },  
  },  
}
```

Implementing APIs

Code, e.g. Python 3

```
51 # Enter API key for this demo (hard coded for sales)
52 # demoKey = str(input('Enter your API key: '))
53 demoKey = 'e71bc6b57a2ea03b054ffe59b1a877bc'
54 token = getAuthToken(demoKey)
55
56 apiKey = '&apiKey={!s}'.format(demoKey)
57 authToken = '&access_token={!s}'.format(token)
58
59 # Enter affiliation ID and Scopus subject area.
60 affiliationID = str(input('Enter your Scopus affiliation ID: '))
61 subjectChoice = (str(input('Enter a subject area? (Y\N): '))).lower()
62
63 if subjectChoice == 'y':
64     subjectArea = str(input('Enter your subject area code: '))
65     affiliationID = 'af-id({!s}) and subjarea({!s})'.format(affiliationID, subjectArea)
66 else:
67     affiliationID = 'af-id({!s})'.format(affiliationID)
68
69 print('\n-----')
70 print('Retrieving data from Scopus API...')
71 print('-----\n')
72
73 # Construct strings for API request.
74 baseURI = 'https://api.elsevier.com/content/search/author?query='
75 queryParams = '&sort=document-count&field=surname,given-name,document-count,affiliation-'
76 response = '&httpAccept=application/json'
77
78 # Concatenate strings to build API request.
79 requestURL = baseURI + affiliationID + queryParams + apiKey + response + authToken
80
81 # Submit API request and convert response to JSON data structure.
82 apiRequest = requests.get(requestURL)
83 apiData = json.loads(apiRequest.text)
```

Tools, e.g. Postman



The screenshot shows the Postman interface. On the left, there is a 'Collections' sidebar with a list of request collections: Veritas (1 request), Anomalies (2 requests), Authentication (2 requests), Authorization test c... (94 requests), Boston College Sa... (3 requests), ELS-SubjectClassifi... (4 requests), ELSAPI APIUser (2 requests), and ELSAPI JIRA Bugs. The main area displays a GET request to the URL 'https://api.elsevier.com/content/affiliation/affiliation_id/60001439?view=sta...'. The response is shown in a 'Pretty' view, displaying a JSON object with the following structure:

```
1- {
2-   "affiliation-retrieval-response": {
3-     "coredata": {
4-       "prism:url": "https://api.elsevier.com/content/affiliation/affiliation_id/60001439",
5-       "dc:identifier": "AFFILIATION_ID:60001439",
6-       "eid": "10-s2.0-60001439",
7-       "author-count": "35750",
8-       "document-count": "171872",
9-       "link": [
10-        {
11-          "@href": "https://api.elsevier.com/content/affiliation/affiliation_id/60001439",
12-          "@rel": "self",
13-          "@_fa": "true"
14-        },
15-        {
16-          "@href": "https://api.elsevier.com/content/search/scopus?query=af-id%2860001439%29",
17-          "@rel": "search",
18-          "@_fa": "true"
19-        }
20-      ],
21-       "@_fa": "true",
22-       "@href": "https://www.scopus.com/affil/profile.uri?afid=60001439&partnerID=H20xMe3&origin=inward",
23-       "@rel": "scopus-affiliation"
24-     }
25-   },
26-   "affiliation-name": "Pennsylvania State University",
27- }
```

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

Elsevier Developers

[My API key](#) [API Specification](#) [Interactive APIs](#) [How to Guides](#) [FAQ](#)

Get started today!

Elsevier's API program allows you to integrate content and data from Elsevier products into your own website and applications. [Learn more...](#)

1. [Look at use cases](#) >
2. [Get API Key](#) > Default API key [settings](#)
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Product APIs

- [About APIs](#) >
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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

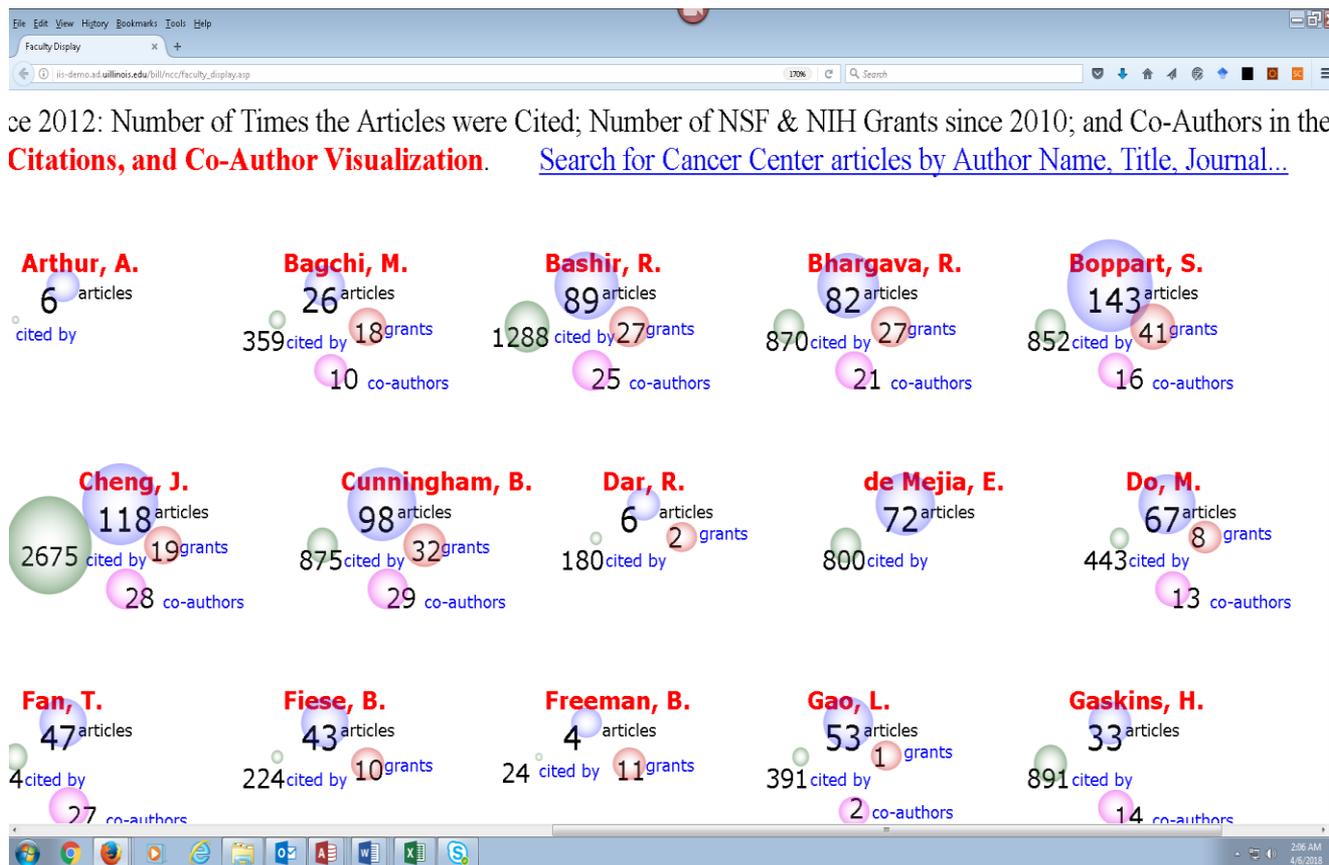
Specifics

- 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

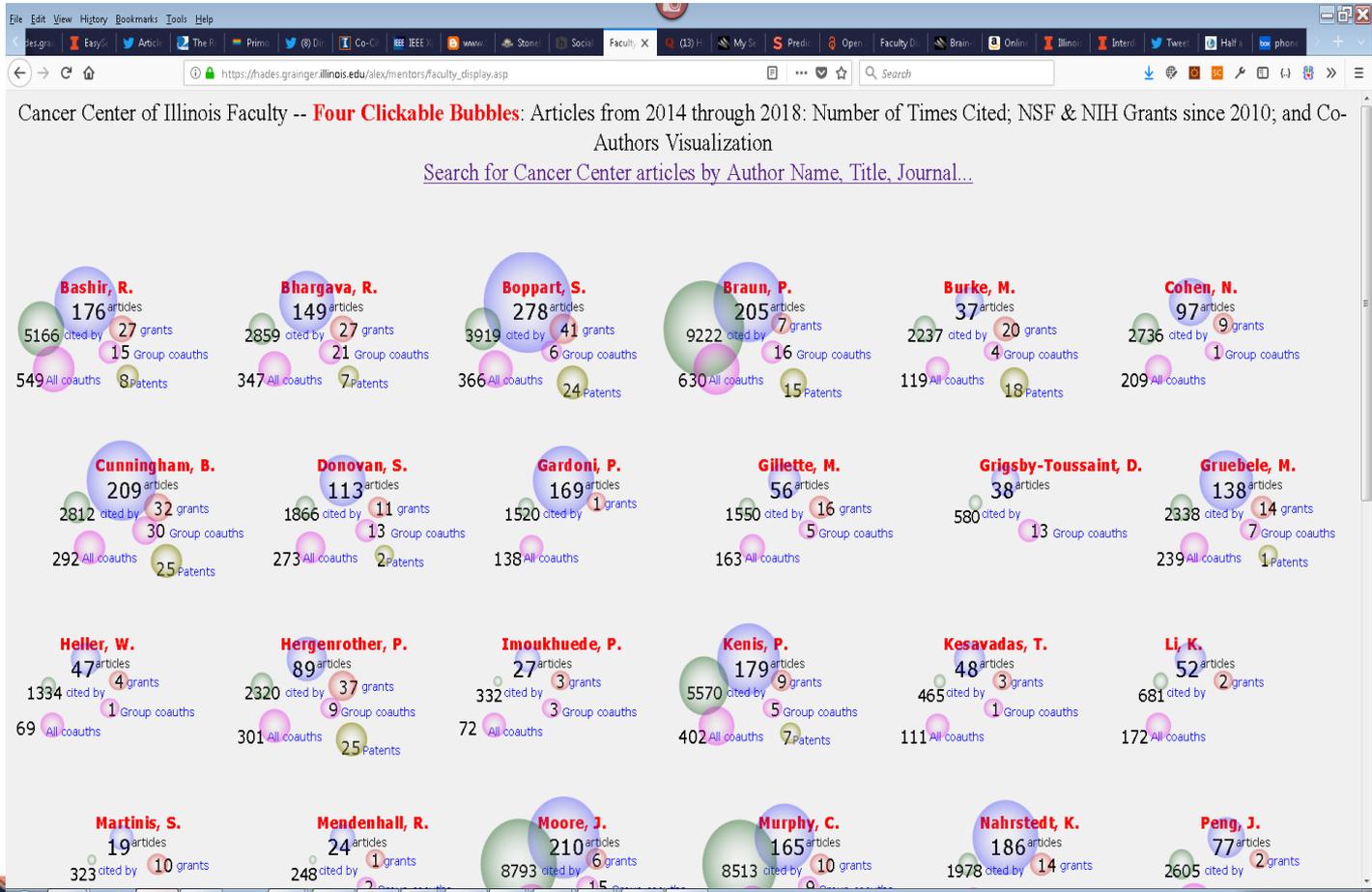
Research Impact Visualizations

- 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



The screenshot shows a web browser window with the address bar containing the URL: `hades.granger@illinois.edu/bill/ncc/ncc_group_post.asp?authorname=Boppart Stephen&from=cited`. The browser's title bar reads "Ncc Faculty Search Results". The page header features the University of Illinois at Urbana-Champaign logo and the text "UNIVERSITY LIBRARY UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN".

The main content area is titled "Search Results" and displays the following information:

You searched for: [Boppart Stephen](#) and retrieved **143** results
[Sort Results by Times Cited](#)

1

Title: **Real-time in vivo computed optical interferometric tomography**

Authors: Ahmad, Adeel; Shemonski, Nathan D.; Adie, Steven G.; Kim, Hee Seok; Hwu, Wen Mei W; Carney, P. Scott; Boppart, Stephen A.

Source Title: **Nature Photonics**, v. 7(6) p. 444-448 June 2013

Abstract: High-resolution real-time tomography of scattering tissues is important for many areas of medicine and biology. However, the compromise between transverse resolution and depth-of-field, in addition to low sensitivity deep in tissue, continues to impede progress towards cellular-level volumetric tomography. Computed imaging has the potential to solve these long-standing limitations. Interferometric synthetic aperture microscopy is a computed imaging technique enabling high-resolution volumetric tomography with spatially invariant resolution. However, its potential for clinical diagnostics remains largely untapped because full volume reconstructions required lengthy post-processing, and the phase-stability requirements have been difficult to satisfy in vivo. Here, we demonstrate how three-dimensional Fourier-domain resampling, in combination with high-speed optical coherence tomography, can achieve high-resolution in vivo tomography. Enhanced depth sensitivity was achieved over a depth of field extended in real time by more than an order of magnitude. This work lays the foundation for high-speed volumetric cellular-level tomography. © 2013 Macmillan Publishers Limited. All rights reserved.

Links: [Full-Text of Article](#) [49 Citing Articles](#) [Scopus link with References](#)

2

Title: **Coherent fiber supercontinuum for biophotonics**

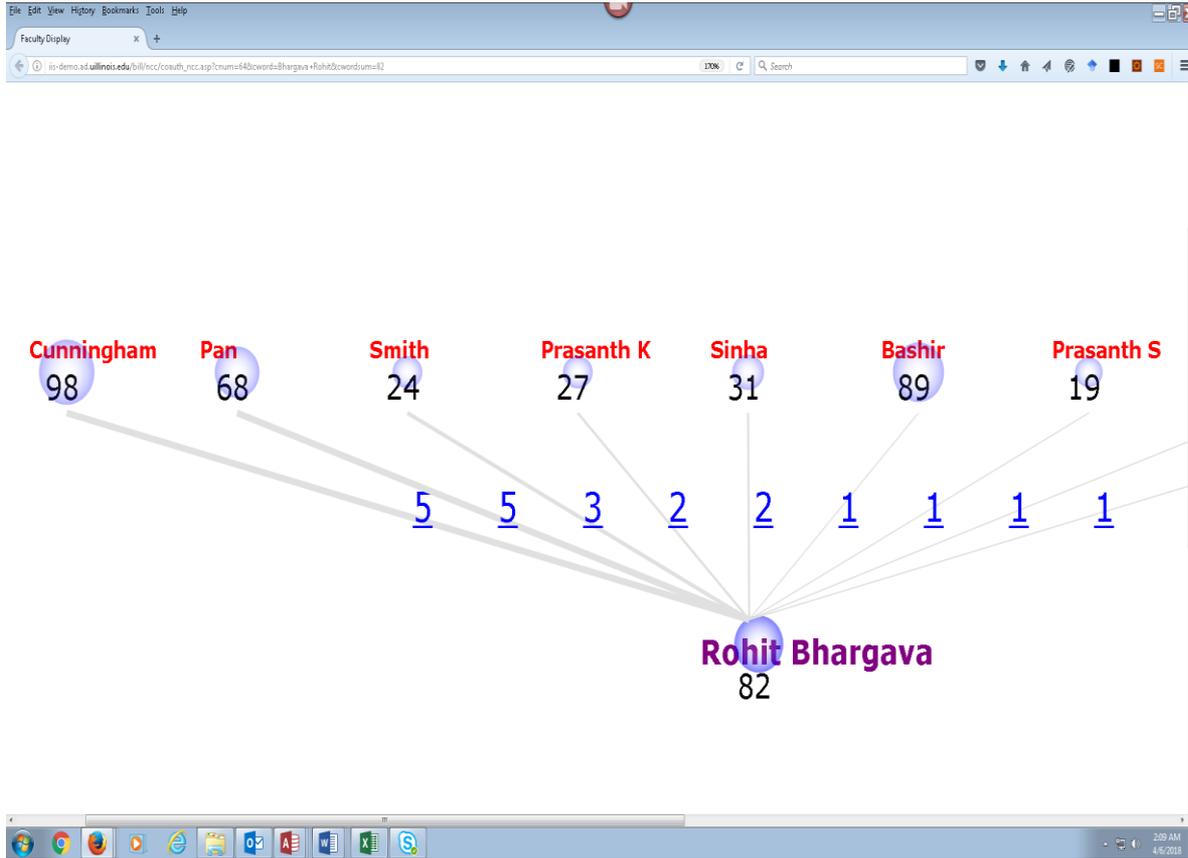
Authors: Tu, Haohua; Boppart, Stephen A.

Source Title: **Laser and Photonics Reviews**, v. 7(5) p. 628-645 September 2013

The bottom of the screenshot shows a Windows taskbar with various application icons and a system tray displaying the time as 1:46 AM on 5/9/2018.



Co-Author Display with Links to Articles



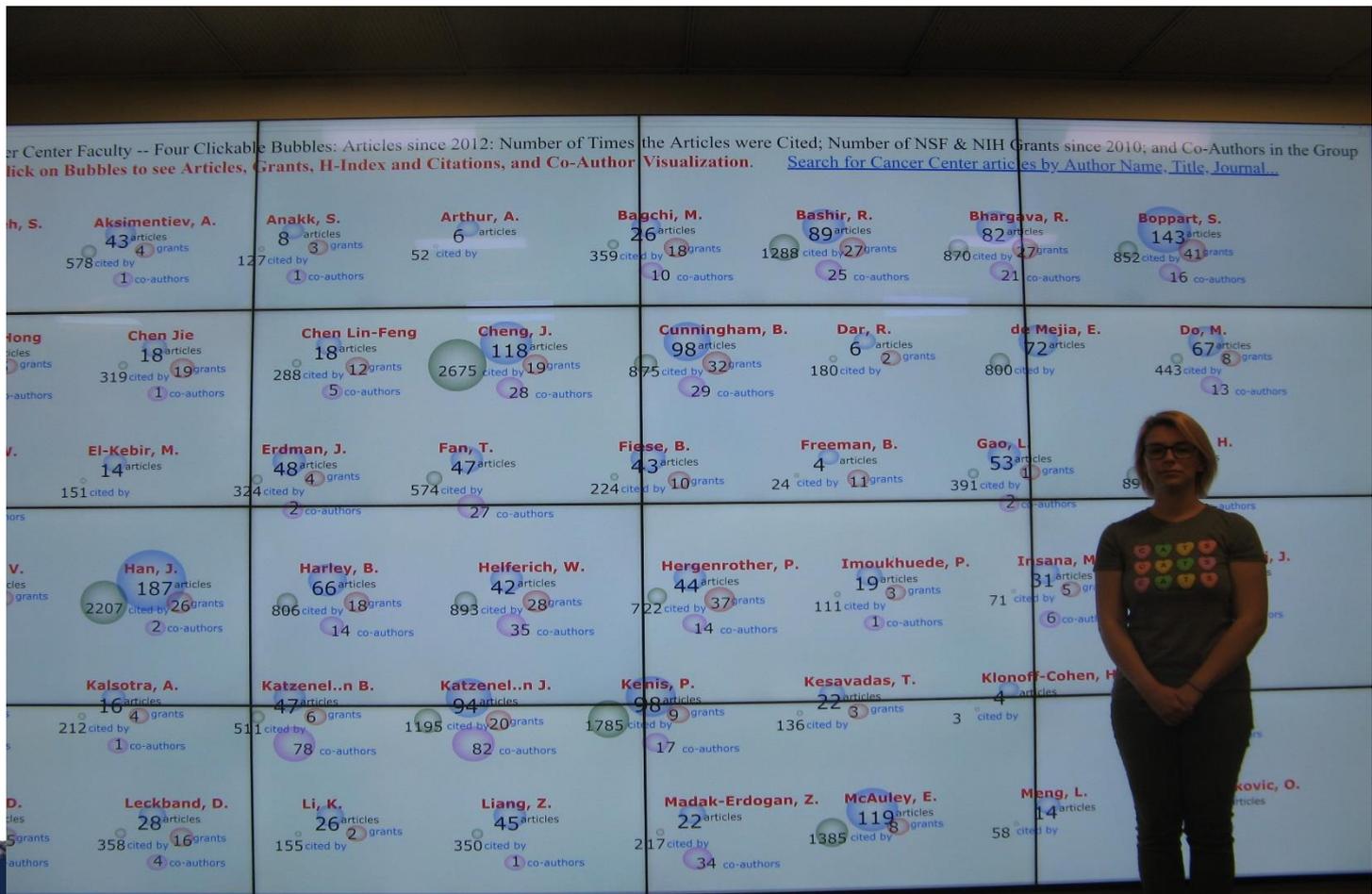
Additional Custom Data

- 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





Thank you.

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Scopus newsletter	https://communications.elsevier.com/webApp/els_doubleOptInWA?do=0&srv=els_scopus&sid=71&uif=0&uvis=3
Twitter	www.twitter.com/scopus
Facebook	www.facebook.com/elsevierscopus
LinkedIn	https://www.linkedin.com/company/scopus-an-eye-on-global-research
YouTube	https://www.youtube.com/c/ScopusDotCom



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Thank you

