RECSM Summer School: Scraping the web

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Networked Democracy Lab www.netdem.org

Course website: github.com/pablobarbera/big-data-upf

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Web scraping is the process of extracting this information automatically and transforming it into a structured dataset.

Two different approaches:

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- 1. Screen scraping: extract data from source code of website, with html parser and/or regular expressions
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- Web APIs (application programming interfaces): a set of structured http requests that return JSON or XML data
 - httr package to construct API requests
 - Packages specific to each API: weatherData, WDI, Rfacebook... Check CRAN Task View on Web Technologies and Services for more examples

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 - Are there any rate limits?
 - Can you share the data?

Workflow:

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- 4. Data cleaning

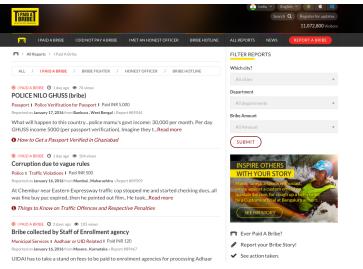
1. Data in table format



List of international courts [edit]

Name	÷	Scope \$	Years ¢	Subject matter \$
International Court of Justice		Global	1945-present	General disputes
International Criminal Court		Global	2002-present	Criminal prosecutions
Permanent Court of International Justice		Global	1922-1946	General disputes
Appellate Body		Global	1995-present	Trade disputes within the WTO
International Tribunal for the Law of the Sea		Global	1994-present	Maritime disputes
African Court of Justice		Africa	2009-present	Interpretation of AU treaties
African Court on Human and Peoples' Rights		Africa	2006-present	Human rights
COMESA Court of Justice		Africa	1998-present	Trade disputes within COMESA
ECOWAS Community Court of Justice		Africa	1996-present	Interpretation of ECOWAS treaties
East African Court of Justice		Africa	2001-present	Interpretation of EAC treaties
SADC Tribunal		Africa	2005-2012	Interpretation of SADC treaties
0.31 0.11.0				

2. Data in unstructured format



www.ipaidabribe.com/reports/paid

3. Data hidden behind web forms



Candidates on 2015 Venezuelan parliamentary election

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- 3. Data hidden behind web forms
 - Automation of web browser behavior with selenium

APIs

API = Application Programming Interface; a set of structured https requests that return data in JSON or XML format.

Types of APIs:

- RESTful APIs: queries for static information at current moment (e.g. user profiles, posts, etc.)
- 2. Streaming APIs: changes in users' data in real time (e.g. new tweets, new FB posts...)

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Most APIs are rate-limited:

Restrictions on number of API calls by user/IP address and period of time.

Connecting with an API

Constructing a REST API call:

- ► Baseline URL: https://maps.googleapis.com/maps/api/geocode/json
- Parameters: ?address=barcelona
- Authentication token: &key=XXXXX

Response is often in JSON format.

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Authentication:

- Many APIs require an access key or token
- An alternative, open standard is called OAuth
- Connections without sharing username or password, only temporary tokens that can be refreshed
- httr package in R implements most cases (examples)

Other APIs

See CRAN Web Technologies Task View