Web Scraping & Provenance Logging Procedures for the Criminal Justice Administrative Records System

Introduction

The Criminal Justice Administrative Records System (CJARS) works to ensure that all of its data were acquired through transparent and legitimate means. CJARS complies with both the requirements established by the University of Michigan Institutional Review Board and the U.S. Computer Fraud and Abuse Act (CFAA). This document outlines the workflow for developing web scrapers in accordance with the CJARS standards.

Scraping Target Criteria

The two factors that determine whether an agency's website is "scrapeable" are its structure and security measures in place. Any agency that provides public access to their offender or criminal court data via (i) Application Programming Interfaces (APIs),[1] (ii) direct downloads,[2] or (iii) search forms is considered for web scraping. Agencies who provide subscription services or bulk purchase agreements are reviewed by a project manager or the principal investigator for acquisition appraisal. Agency websites using any security measures that require manual human interaction to prevent access by robots or non-human entities are not targeted; this would be a direct violation of the website's terms of use. Instead, data from such agencies should be acquired through a Freedom of Information Act (FOIA) request or a data use agreement with the agency.

[1] One agency that has provided API service to access court data is the Wisconsin Circuit Court Access system. For such API-enabled targets, save the full JSON response as a *.json file.

[2] Some agencies have allowed users to directly download their database. For an example, see Nebraska Department of Correctional Services (`https://dcs-inmatesearch.ne.gov/Corrections/COR_download.htm`).

555 South Forest Avenue
Ann Arbor, MI 48104
https://cjars.org
(844) 864-8056

Scraping Practice Guidelines

All project web crawlers must conform to specific guidelines to ensure scraping efforts do not jeopardize other data collection efforts or CJARS overall. To ensure compliance with the Access Provision laid out in the CFAA, scraping efforts must consider both a website's terms of service (ToS) as well as the privacy policy of using personal information. Although ToS typically contain brief disclaimers, some of the more scraper-friendly agencies may also share additional guidelines specifically pertaining to scraping, such as when to run a scraper (Figure 1). Violating ToS can expose the project and the university to legal liabilities and reputational concerns. Therefore, reviewing ToS carefully is critical to ensure CJARS avoids improper data collection behavior.

In addition, the robots exclusion protocol (robots.txt) provides instructions about the listed directories of a website to robots, an automated program for harvesting web data by emulating human behavior. Figure 2 provides an example of such a file. From these text files, the only field that will be singled out in this document is the `Crawl-delay` field for rate limiting crawl requests. As an example, if an agency's robots.txt has `Crawl-delay: 10`, then for each interaction the crawler makes with the website that causes the page to refresh or reload, the crawler should wait at least 10 seconds before proceeding with the next task. For websites that do not explicitly specify a rate limiter, the default strategy should be to use `from selenium.webdriver.support.ui import WebDriverWait` function to wait up to 30 seconds for an HTML element to load.

To maintain stable data use relationships with an agency, CJARS limits the number of threads (or workers) when running a crawler in parallelization or distributed queues to avoid causing denial of service on the agency website and ensure CJARS IP network remains whitelisted. As such, a crawler can be assigned a maximum of 4 threads out of consideration for the CJARS' scraper server's resource constraints as well as the target's capacity constraints. If 4 concurrent threads is causing target servers to slow and potentially crash, the number of concurrent threads should be reduced as needed. Under no circumstance should a scraper be repeatedly launched against a target if the script consistently leads to target server crash.

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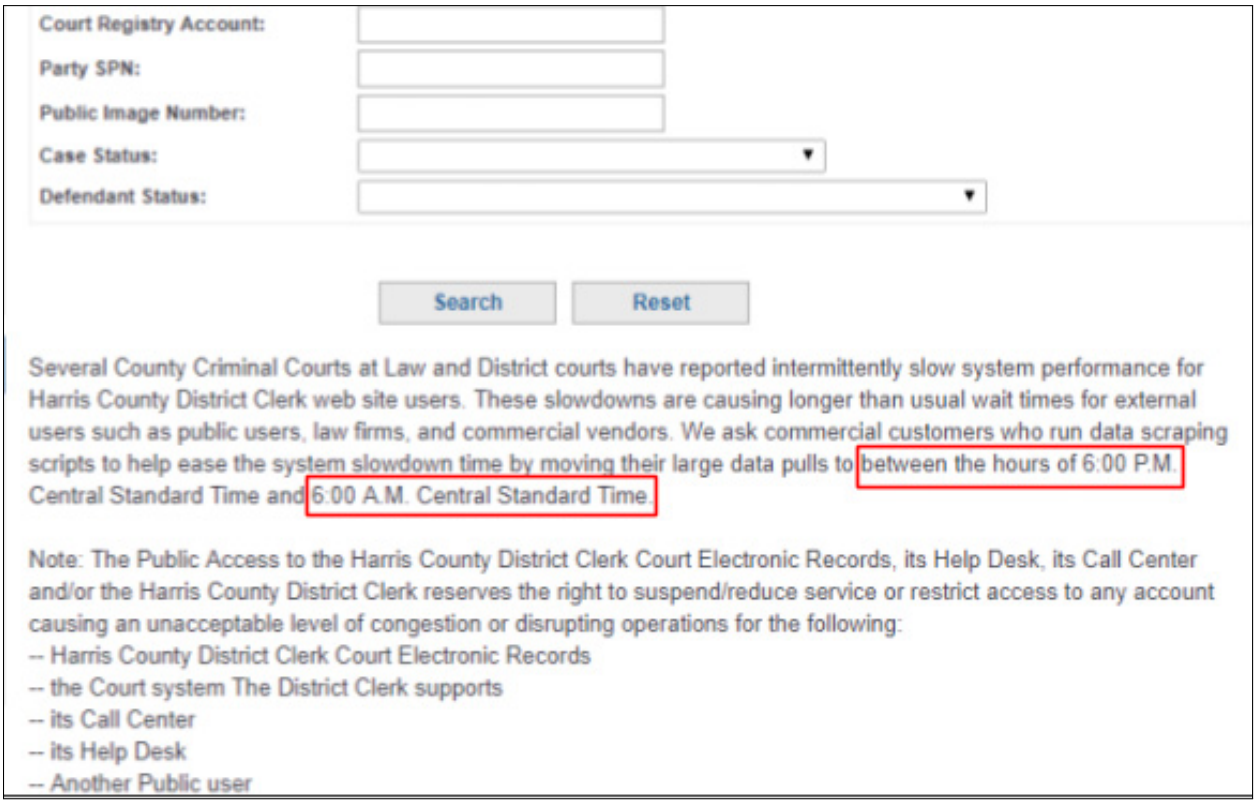
Figure 1: Example of ToS with Scraping Guidelines



Texas Harris County District Clerk website provides guidelines for the best time to run web scrapers.

Documentation & Provenance

CJARS is required to provide documentation of legal provenance for all data brought to the U.S. Census Bureau. To satisfy these requirements, the crawler should archive the following files within the relevant "./documentation/provenance" directories:

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Figure 2: Example of robots.txt

```
User-agent: *
Disallow: /criminalBackgroundSearch/
User-agent: *
Allow: /
User-agent: *
#Crawl-delay: 30
```

- Robots exclusion protocol (robots.txt)
  - If there is no robots.txt, save the contents of the page as "robots_404.txt"
- Screenshot of source webpage (PDF or PNG)
- Perma.cc link of source (HTML page)
  - If the main page does not contain ToS information, a separate Perma.cc link should be created for the page with ToS details

Perma.cc provides a permanent third-party hosted snapshot of the ToS when scraping is launched. This important documentation serves as proof that our collection efforts were not improper even if ToS are modified at a future date by a target site.

When a website also provides a data dictionary, this information should be saved in the documentation folder for future reference. See Figures 3 and 4 below for examples of relevant folder layout.

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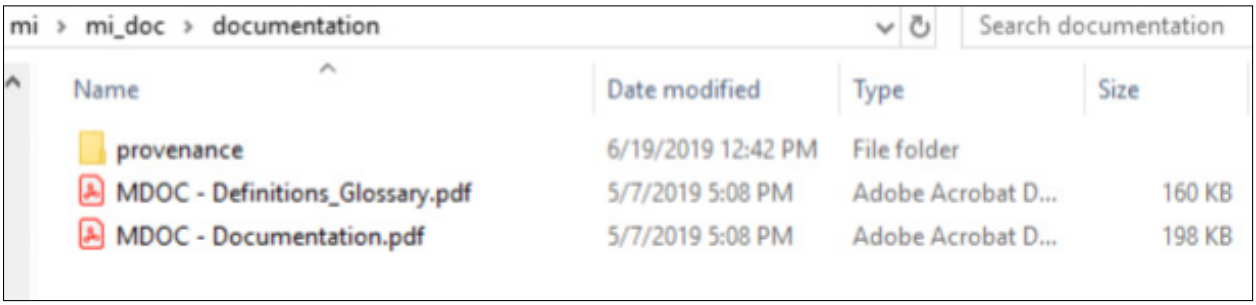
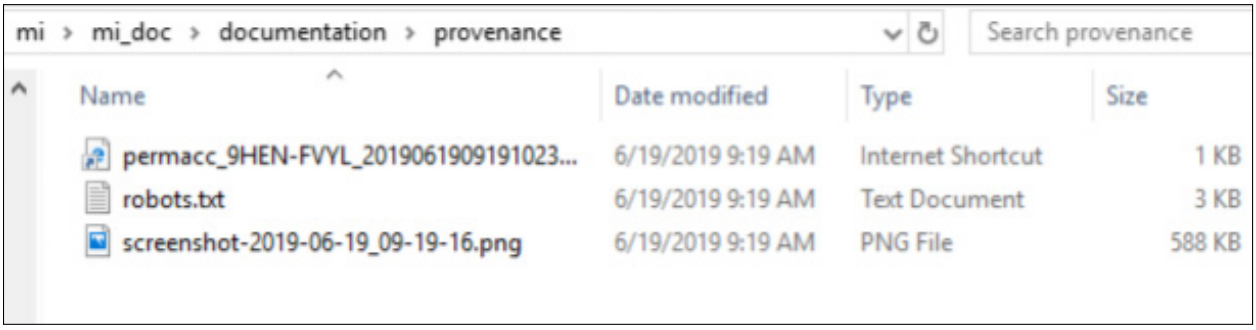
Figure 3: Example of "documentation" folder contents



The "MDOC - DOCUMENTATION.pdf" provides instructional information on the website search engine as well as its ToS while "MDOC - Definitions_Glossary.pdf" is the data dictionary that explains the definitions of the variables.

Figure 4: Example of "provenance" folder contents



The three files that should always be included in the provenance.

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