
shot-scraper documentation

Release 1.4

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A command-line utility for taking automated screenshots of websites

Quick start:

```
pip install shot-scraper
shot-scraper install
shot-scraper https://github.com/simonw/shot-scraper -h 900
```

Produces this screenshot in a file called `github-com-simonw-shot-scraper.png`:

Contents

INSTALLATION

Install this tool using pip:

```
pip install shot-scraper
```

This tool depends on Playwright, which first needs to install its own dedicated Chromium browser.

Run `shot-scraper install` once to install that:

```
% shot-scraper install
Downloading Playwright build of chromium v965416 - 117.2 Mb [=====] 100%
↳ 0.0s
Playwright build of chromium v965416 downloaded to /Users/simon/Library/Caches/ms-
↳ playwright/chromium-965416
Downloading Playwright build of ffmpeg v1007 - 1.1 Mb [=====] 100% 0.0s
Playwright build of ffmpeg v1007 downloaded to /Users/simon/Library/Caches/ms-playwright/
↳ ffmpeg-1007
```

If you want to use other browsers such as Firefox you should install those too:

```
% shot-scraper install -b firefox
```

1.1 shot-scraper install --help

Full `--help` for the `shot-scraper install` command:

```
Usage: shot-scraper install [OPTIONS]

Install the Playwright browser needed by this tool.

Usage:

    shot-scraper install

Or for browsers other than the Chromium default:

    shot-scraper install -b firefox

Options:
    -b, --browser [chromium|firefox|webkit|chrome|chrome-beta]
```

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--help

Which browser to install
Show this message **and** exit.

TAKING A SCREENSHOT

To take a screenshot of a web page and write it to `datasette-io.png` run this:

```
shot-scraper https://datasette.io/
```

If a file called `datasette-io.png` already exists the filename `datasette-io.1.png` will be used instead.

You can use the `-o` option to specify a filename:

```
shot-scraper https://datasette.io/ -o datasette.png
```

Use `-o -` to write the PNG image to standard output:

```
shot-scraper https://datasette.io/ -o - > datasette.png
```

If you omit the protocol `http://` will be added automatically, and any redirects will be followed:

```
shot-scraper datasette.io -o datasette.png
```

2.1 Adjusting the browser width and height

The browser window used to take the screenshots defaults to 1280px wide and 780px tall.

You can adjust these with the `--width` and `--height` options (`-w` and `-h` for short):

```
shot-scraper https://datasette.io/ -o small.png --width 400 --height 800
```

If you provide both options, the resulting screenshot will be of that size. If you omit `--height` a full page length screenshot will be produced (the default).

2.2 Screenshotting a specific area with CSS selectors

To take a screenshot of a specific element on the page, use `--selector` or `-s` with its CSS selector:

```
shot-scraper https://simonwillison.net/ -s '#bighead'
```

This produces `simonwillison-net.png` containing this image:

When using `--selector` the height and width, if provided, will set the size of the browser window when the page is loaded but the resulting screenshot will still be the same dimensions as the element on the page.

You can pass `--selector` multiple times. The resulting screenshot will cover the smallest area of the page that contains all of the elements you specified, for example:

```
shot-scraper https://simonwillison.net/ \  
-s '#bighead' -s '.overband' \  
-o bighead-multi-selector.png
```

To capture a rectangle around every element that matches a CSS selector, use `--selector-all`:

```
shot-scraper https://simonwillison.net/ \  
--selector-all '.day' \  
-o just-the-day-boxes.png
```

You can add `--padding 20` to add 20px of padding around the elements when the shot is taken.

2.3 Specifying elements using JavaScript filters

The `--js-selector` and `--js-selector-all` options can be used to use JavaScript expressions to select elements that cannot be targetted just using CSS selectors.

The options should be passed JavaScript expression that operates on the `el` variable, returning `true` if that element should be included in the screenshot selection.

To take a screenshot of the first paragraph on the page that contains the text “shot-scraper” you could run the following:

```
shot-scraper https://github.com/simonw/shot-scraper \  
--js-selector 'el.tagName == "P" && el.innerText.includes("shot-scraper")'
```

The `el.tagName == "P"` part is needed here because otherwise the `<html>` element on the page will be the first to match the expression.

The generated JavaScript that will be executed on the page looks like this:

```
Array.from(document.getElementsByTagName('*')).find(  
  el => el.tagName == "P" && el.innerText.includes("shot-scraper")  
)<div>classList.add("js-selector-a1f5ba0fc4a4317e58a3bd11a0f16b96");
```

The `--js-selector-all` option will select all matching elements, in a similar fashion to the `--selector-all` option described above.

2.4 Waiting for a delay

Sometimes a page will not have completely loaded before a screenshot is taken. You can use `--wait X` to wait the specified number of milliseconds after the page load event has fired before taking the screenshot:

```
shot-scraper https://simonwillison.net/ --wait 2000
```

2.5 Waiting until a specific condition

In addition to waiting a specific amount of time, you can also wait until a JavaScript expression returns true using the `--wait-for expression` option.

This example takes the screenshot the moment a `<div>` with an ID of content becomes available in the DOM:

```
shot-scraper https://.../ \
  --wait-for 'document.querySelector("div#content")'
```

2.6 Executing custom JavaScript

You can use custom JavaScript to modify the page after it has loaded (after the ‘onload’ event has fired) but before the screenshot is taken using the `--javascript` option:

```
shot-scraper https://simonwillison.net/ \
  -o simonwillison-pink.png \
  --javascript "document.body.style.backgroundColor = 'pink';"
```

2.7 Using JPEGs instead of PNGs

Screenshots default to PNG. You can save as a JPEG by specifying a `-o` filename that ends with `.jpg`.

You can also use `--quality X` to save as a JPEG with the specified quality, in order to reduce the filesize. 80 is a good value to use here:

```
shot-scraper https://simonwillison.net/ \
  -h 800 -o simonwillison.jpg --quality 80
% ls -lah simonwillison.jpg
-rw-r--r--@ 1 simon staff 168K Mar  9 13:53 simonwillison.jpg
```

2.8 Device scale factor

The `--scale-factor` option sets a specific device scale factor, which effectively simulates different device pixel ratios. This setting is useful for testing high-definition displays or emulating screens with various pixel densities.

For example, setting `--scale-factor 3` results in an image with a CSS pixel ratio of 3, which is ideal for emulating a high-resolution display, such as Apple iPhone 12 screens.

To take a screenshot with a scale factor of 3 (tripled resolution), run the following command:

```
shot-scraper https://simonwillison.net/ -o simon.png \
  --width 390 --height 844 --scale-factor 3
```

This will multiply both the width and height of the screenshot by 3, resulting in an image that is 1170px wide and 2532px high, matching the iPhone 12’s screen.

The `--scale-factor` option takes a positive float as input. For example, setting `--scale-factor 2.625` simulates the Google Pixel 6’s CSS pixel ratio.

2.9 Retina images

The `--retina` option is a shortcut to set a device scale factor of 2. This means that an image will have its resolution effectively doubled, emulating the display of images on [retina](#) or higher pixel density screens.

```
shot-scraper https://simonwillison.net/ -o simon.png \  
  --width 400 --height 600 --retina
```

This example will produce an image that is 800px wide and 1200px high.

Note: The `--retina` option should not be used in conjunction with the `--scale-factor` flag as they are mutually exclusive. If both are provided, the command will raise an error to prevent conflicts.

2.10 Transparent background

The `--omit-background` option instructs the browser to ignore the default background, allowing for the capture of a page with a transparent background. Does not work with JPG images or when `quality` is set.

```
shot-scraper https://simonwillison.net/ -o simon.png \  
  --width 400 --height 600 --omit-background
```

2.11 Interacting with the page

Sometimes it's useful to be able to manually interact with a page before the screenshot is captured.

Add the `--interactive` option to open a browser window that you can interact with. Then hit `<enter>` in the terminal when you are ready to take the shot and close the window.

```
shot-scraper https://simonwillison.net/ -o after-interaction.png \  
  --height 800 --interactive
```

This will output:

```
Hit <enter> to take the shot and close the browser window:  
  # And after you hit <enter>...  
Screenshot of 'https://simonwillison.net/' written to 'after-interaction.png'
```

2.12 Logging all requests

It can sometimes be useful to see a list of all of the requests that the browser made while it was rendering a page.

Use `--log-requests` to output newline-delimited JSON representing each request, including requests for images and other assets.

Pass `-` to output the list to standard output, or use a filename to write to a file on disk.

The output looks like this:

```
% shot-scraper http://datasette.io/ --log-requests -
{"method": "GET", "url": "http://datasette.io/", "status": 302, "size": null, "timing": {
  ↪ "startTime": 1663211674984.7068, "domainLookupStart": 0.698, "domainLookupEnd": 1.897,
  ↪ "connectStart": 1.897, "secureConnectionStart": -1, "connectEnd": 18.726, "requestStart
  ↪ ": 18.86, "responseStart": 99.75, "responseEnd": 101.75000000162981}}
{"method": "GET", "url": "https://datasette.io/", "status": 200, "size": 34592, "timing
  ↪ ": {"startTime": 1663211675085.51, "domainLookupStart": 0.187, "domainLookupEnd": 0.
  ↪ 197, "connectStart": 0.197, "secureConnectionStart": 15.719, "connectEnd": 63.854,
  ↪ "requestStart": 64.098, "responseStart": 390.231, "responseEnd": 399.268}}
{"method": "GET", "url": "https://datasette.io/static/site.css", "status": 200, "size": 3
  ↪ 952, "timing": {"startTime": 1663211675486.027, "domainLookupStart": -1,
  ↪ "domainLookupEnd": -1, "connectStart": -1, "secureConnectionStart": -1, "connectEnd": -
  ↪ 1, "requestStart": 0.408, "responseStart": 99.407, "responseEnd": 100.433}}
...
```

Note that the size field here will be the size of the response in bytes, but in some circumstances this will not be available and it will be returned as "size": null.

2.13 Browser arguments

Additional arguments to pass to the browser instance. The list of Chromium flags can be found [here](#).

For example, to remove font render hinting:

```
shot-scraper https://simonwillison.net/ -o no-hinting.png \
  --height 800 --browser-arg "--font-render-hinting=none"
```

To add multiple arguments, add --browser-arg for each argument:

```
shot-scraper https://simonwillison.net/ -o no-hinting-no-gpu.png \
  --height 800 --browser-arg "--font-render-hinting=none" --browser-arg "--disable-gpu"
```

2.14 Taking screenshots of local HTML files

You can pass the path to an HTML file on disk to take a screenshot of that rendered file:

```
shot-scraper index.html -o index.png
```

CSS and images referenced from that file using relative paths will also be included.

2.15 Tips for executing JavaScript

If you are using the --javascript option to execute code, that code will be executed after the page load event has fired but before the screenshot is taken.

You can use that code to do things like hide or remove specific page elements, click on links to open menus, or even add annotations to the page such as this [pink arrow example](#).

This code hides any element with a [data-ad-rendered] attribute and the element with id="ensNotifyBanner":

```
document.querySelectorAll(
  '[data-ad-rendered],#ensNotifyBanner'
).forEach(el => el.style.display = 'none')
```

You can execute that like so:

```
shot-scraper https://www.latimes.com/ -o latimes.png --javascript "
document.querySelectorAll(
  '[data-ad-rendered],#ensNotifyBanner'
).forEach(el => el.style.display = 'none')
"
```

In some cases you may need to add a pause that executes during your custom JavaScript before the screenshot is taken - for example if you click on a button that triggers a short fading animation.

You can do that using the following pattern:

```
new Promise(takeShot => {
  // Your code goes here
  // ...
  setTimeout(() => {
    // Resolving the promise takes the shot
    takeShot();
  }, 1000);
});
```

If your custom code defines a `Promise`, `shot-scraper` will wait for that promise to complete before taking the screenshot. Here the screenshot does not occur until the `takeShot()` function is called.

If you see errors relating to CSP headers such as “Failed to fetch dynamically imported module” you can work around them using *the `--bypass-csp` option*.

2.16 Viewing `console.log()` output

Almost all of the `shot-scraper` commands accept a `--log-console` option, which will cause them to output any calls to `console.log()` to standard error while the command is running.

This includes both `console.log()` calls in the existing page JavaScript, as well as any calls to that method that you include in your own custom JavaScript.

For example, running `--log-console` while taking a screenshot of the Facebook homepage will show this warning message, which Facebook logs to the developer tools console to help protect people from social engineering attacks:

```
% shot-scraper shot facebook.com --log-console
```

```
.d8888b. 888 888
d88P Y88b 888 888
Y88b. 888 888
"Y888b. 888888 .d88b. 88888b. 888
  "Y88b. 888 d88""88b 888 "88b 888
    "888 888 888 888 888 888 Y8P
Y88b d88P Y88b. Y88..88P 888 d88P
"Y8888P" "Y888 "Y88P" 88888P" 888
                        888
```

This **is** a browser feature intended **for** developers. If someone told you to copy-paste something here to enable a Facebook feature or "hack" someone's account, it is a scam **and** will give them access to your Facebook account.

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```
888
888
```

See <https://www.facebook.com/selfxss> for more information.

Screenshot of '<http://facebook.com>' written to '[facebook-com.png](#)'

2.17 shot-scraper shot --help

Full --help for this command:

Usage: shot-scraper shot [OPTIONS] URL

Take a single screenshot of a page or portion of a page.

Usage:

```
shot-scraper www.example.com
```

This will write the screenshot to `www-example-com.png`

Use `"-o"` to write to a specific file:

```
shot-scraper https://www.example.com/ -o example.png
```

You can also `pass` a path to a local file on disk:

```
shot-scraper index.html -o index.png
```

Using `"-o -"` will output to standard out:

```
shot-scraper https://www.example.com/ -o - > example.png
```

Use `-s` to take a screenshot of one area of the page, identified using one or more CSS selectors:

```
shot-scraper https://simonwillison.net -s '#bighead'
```

Options:

<code>-a, --auth FILENAME</code>	Path to JSON authentication context file
<code>-w, --width INTEGER</code>	Width of browser window, defaults to 1280
<code>-h, --height INTEGER</code>	Height of browser window and shot - defaults to the full height of the page
<code>-o, --output FILE</code>	
<code>-s, --selector TEXT</code>	Take shot of first element matching this CSS selector
<code>--selector-all TEXT</code>	Take shot of all elements matching this CSS selector
<code>--js-selector TEXT</code>	Take shot of first element matching this JS (el) expression

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<code>--js-selector-all TEXT</code>	Take shot of all elements matching this JS (el) expression
<code>-p, --padding INTEGER</code>	When using selectors, add this much padding in pixels
<code>-j, --javascript TEXT</code>	Execute this JS prior to taking the shot
<code>--scale-factor FLOAT</code>	Device scale factor. Cannot be used together with '--retina' .
<code>--retina</code>	Use device scale factor of 2. Cannot be used together with '--scale-factor' .
<code>--omit-background</code>	Omit the default browser background from the shot, making it possible take advantage of transparence. Does not work with JPEGs or when using <code>--quality</code> .
<code>--quality INTEGER</code>	Save as JPEG with this quality, e.g. 80
<code>--wait INTEGER</code>	Wait this many milliseconds before taking the screenshot
<code>--wait-for TEXT</code>	Wait until this JS expression returns true
<code>--timeout INTEGER</code>	Wait this many milliseconds before failing
<code>-i, --interactive</code>	Interact with the page in a browser before taking the shot
<code>--devtools</code>	Interact mode with developer tools
<code>--log-requests FILENAME</code>	Log details of all requests to this file
<code>--log-console</code>	Write console.log() to stderr
<code>-b, --browser [chromium firefox webkit chrome chrome-beta]</code>	Which browser to use
<code>--browser-arg TEXT</code>	Additional arguments to pass to the browser
<code>--user-agent TEXT</code>	User-Agent header to use
<code>--reduced-motion</code>	Emulate 'prefers-reduced-motion' media feature
<code>--fail</code>	Fail with an error code if a page returns an HTTP error
<code>--skip</code>	Skip pages that return HTTP errors
<code>--bypass-csp</code>	Bypass Content-Security-Policy
<code>--silent</code>	Do not output any messages
<code>--auth-password TEXT</code>	Password for HTTP Basic authentication
<code>--auth-username TEXT</code>	Username for HTTP Basic authentication
<code>--help</code>	Show this message and exit.

WEBSITES THAT NEED AUTHENTICATION

If you want to take screenshots of a site that has some form of authentication, you will first need to authenticate with that website manually.

You can do that using the `shot-scraper auth` command:

```
shot-scraper auth \  
  https://datasette-auth-passwords-demo.datasette.io/-/login \  
  auth.json
```

(For this demo, use username = `root` and password = `password!`)

This will open a browser window on your computer showing the page you specified.

You can then sign in using that browser window - including 2FA or CAPTCHAs or other more complex form of authentication.

When you are finished, hit <enter> at the `shot-scraper` command-line prompt. The browser will close and the authentication credentials (usually cookies) for that browser session will be written out to the `auth.json` file.

To take authenticated screenshots you can then use the `-a` or `--auth` options to point to the JSON file that you created:

```
shot-scraper https://datasette-auth-passwords-demo.datasette.io/ \  
  -a auth.json -o authed.png
```

3.1 shot-scraper auth --help

Full `--help` for `shot-scraper auth`:

```
Usage: shot-scraper auth [OPTIONS] URL CONTEXT_FILE
```

Open a browser so user can manually authenticate **with** the specified site, then save the resulting authentication context to a file.

Usage:

```
shot-scraper auth https://github.com/ auth.json
```

Options:

```
-b, --browser [chromium|firefox|webkit|chrome|chrome-beta]
```

Which browser to use

```
--browser-arg TEXT
```

Additional arguments to **pass** to the browser

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<code>--user-agent TEXT</code>	User-Agent header to use
<code>--devtools</code>	Open browser DevTools
<code>--log-console</code>	Write <code>console.log()</code> to stderr
<code>--help</code>	Show this message and exit.

TAKING MULTIPLE SCREENSHOTS

You can configure multiple screenshots using a YAML file. Create a file called `shots.yml` that looks like this:

```
- output: example.com.png
  url: http://www.example.com/
- output: w3c.org.png
  url: https://www.w3.org/
```

Then run the tool like so:

```
shot-scraper multi shots.yml
```

This will create two image files, `www-example-com.png` and `w3c.org.png`, containing screenshots of those two URLs.

Use `-` to pass in YAML from standard input:

```
echo "- url: http://www.example.com" | shot-scraper multi -
```

If you run the tool with the `-n` or `--no-clobber` option any shots where the output file already exists will be skipped.

You can specify a subset of screenshots to take by specifying output files that you would like to create. For example, to take just the shots of `one.png` and `three.png` that are defined in `shots.yml` run this:

```
shot-scraper multi shots.yml -o one.png -o three.png
```

The `url:` can be set to a path to a file on disk as well:

```
- output: index.png
  url: index.html
```

Use the `--scale-factor` option to capture all screenshots at a specific scale factor, which effectively simulates different device pixel ratios. This setting is useful for testing high-definition displays or emulating screens with various pixel densities.

For example, setting `--scale-factor 3` results in screenshots with a CSS pixel ratio of 3, which is ideal for emulating a high-resolution display, such as Apple's iPhone 12 screens.

To take screenshots with a scale factor of 3 (tripled resolution), run the following command:

```
shot-scraper multi shots.yml --scale-factor 3
```

This will multiply both the width and height of all screenshots by 3, resulting in images with a higher level of detail, suitable for scenarios where you need to capture the screen as it would appear on a high-DPI display.

Use `--retina` to take all screenshots at retina resolution instead, doubling the dimensions of the files:

```
shot-scraper multi shots.yml --retina
```

Note: The `--retina` option should not be used in conjunction with the `--scale-factor` flag as they are mutually exclusive. If both are provided, the command will raise an error to prevent conflicts.

To take a screenshot of just the area of a page defined by a CSS selector, add `selector` to the YAML block:

```
- output: bighead.png
  url: https://simonwillison.net/
  selector: "#bighead"
```

You can pass more than one selector using a `selectors:` list. You can also use `padding:` to specify additional padding:

```
- output: bighead-multi-selector.png
  url: https://simonwillison.net/
  selectors:
    - "#bighead"
    - ".overband"
  padding: 20
```

You can use `selector_all:` to capture every element matching a selector, or `selectors_all:` to pass a list of such selectors:

```
- output: selectors-all.png
  url: https://simonwillison.net/
  selectors_all:
    - .day
    - .entry:nth-of-type(1)
  padding: 20
```

The `--js-selector` and `--js-selector-all` options can be provided using the `js_selector:`, `js_selectors:`, `js_selector_all:` and `js_selectors_all:` keys:

```
- output: js-selector-all.png
  url: https://github.com/simonw/shot-scraper
  js_selector: |-
    el.tagName == "P" && el.innerText.includes("shot-scraper")
  padding: 20
```

To execute JavaScript after the page has loaded but before the screenshot is taken, add a `javascript` key:

```
- output: bighead-pink.png
  url: https://simonwillison.net/
  selector: "#bighead"
  javascript: |
    document.body.style.backgroundColor = 'pink'
```

You can include desired height, width, quality, wait and wait_for options on each item as well:

```
- output: simon-narrow.jpg
  url: https://simonwillison.net/
  width: 400
  height: 800
```

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```
quality: 80
wait: 500
wait_for: document.querySelector('#bighead')
```

4.1 shot-scraper multi --help

Full --help for this command:

Usage: shot-scraper multi [OPTIONS] CONFIG

Take multiple screenshots, defined by a YAML file

Usage:

```
shot-scraper multi config.yml
```

Where config.yml contains configuration like this:

```
- output: example.png
  url: http://www.example.com/
```

<https://shot-scraper.datasette.io/en/stable/multi.html>

Options:

-a, --auth FILENAME	Path to JSON authentication context file
--scale-factor FLOAT	Device scale factor. Cannot be used together with '--retina'.
--retina	Use device scale factor of 2. Cannot be used together with '--scale-factor'.
--timeout INTEGER	Wait this many milliseconds before failing
-n, --no-clobber	Skip images that already exist
-o, --output TEXT	Just take shots matching these output files
-b, --browser [chromium firefox webkit chrome chrome-beta]	Which browser to use
--browser-arg TEXT	Additional arguments to pass to the browser
--user-agent TEXT	User-Agent header to use
--reduced-motion	Emulate 'prefers-reduced-motion' media feature
--log-console	Write console.log() to stderr
--fail	Fail with an error code if a page returns an HTTP error
--skip	Skip pages that return HTTP errors
--silent	Do not output any messages
--auth-password TEXT	Password for HTTP Basic authentication
--auth-username TEXT	Username for HTTP Basic authentication
--help	Show this message and exit.

SCRAPING PAGES USING JAVASCRIPT

The `shot-scraper javascript` command can be used to execute JavaScript directly against a page and return the result as JSON.

This command doesn't produce a screenshot, but has interesting applications for scraping.

To retrieve a string title of a document:

```
shot-scraper javascript https://datasette.io/ "document.title"
```

This returns a JSON string:

```
"Datasette: An open source multi-tool for exploring and publishing data"
```

To return a raw string instead, use the `-r` or `--raw` options:

```
shot-scraper javascript https://datasette.io/ "document.title" -r
```

Output:

```
Datasette: An open source multi-tool for exploring and publishing data
```

To return a JSON object, wrap an object literal in parenthesis:

```
shot-scraper javascript https://datasette.io/ "({  
  title: document.title,  
  tagline: document.querySelector('.tagline').innerText  
})"
```

This returns:

```
{  
  "title": "Datasette: An open source multi-tool for exploring and publishing data",  
  "tagline": "An open source multi-tool for exploring and publishing data"  
}
```

5.1 Running more than one statement

You can use `() => { ... }` function syntax to run multiple statements, returning a result at the end of your function.

This example raises an error if no paragraphs are found.

```
shot-scraper javascript https://www.example.com/ "  
() => {  
  var paragraphs = document.querySelectorAll('p');  
  if (paragraphs.length == 0) {  
    throw 'No paragraphs found';  
  }  
  return Array.from(paragraphs, el => el.innerText);  
}"
```

5.2 Using async/await

You can pass an `async` function if you want to use `await`, including to import modules from external URLs. This example loads the [Readability.js](#) library from [Skypack](#) and uses it to extract the core content of a page:

```
shot-scraper javascript \  
  https://simonwillison.net/2022/Mar/14/scraping-web-pages-shot-scraper/ "  
async () => {  
  const readability = await import('https://cdn.skypack.dev/@mozilla/readability');  
  return (new readability.Readability(document)).parse();  
}"
```

To use functions such as `setInterval()`, for example if you need to delay the shot for a second to allow an animation to finish running, return a promise:

```
shot-scraper javascript datasette.io "  
new Promise(done => setInterval(  
  () => {  
    done({  
      title: document.title,  
      tagline: document.querySelector('.tagline').innerText  
    });  
  }, 1000  
));"
```

5.3 Bypassing Content Security Policy headers

Some websites use [Content Security Policy](#) (CSP) headers to prevent additional JavaScript from executing on the page, as a security measure.

When using `shot-scraper` this can prevent some JavaScript features from working. You might see error messages that look like this:

```
shot-scraper javascript github.com "  
  async () => {
```

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```
await import('https://cdn.jsdelivr.net/npm/left-pad/+esm');
return 'content-security-policy ignored' }
"
```

Output:

```
Error: TypeError: Failed to fetch dynamically imported module:
https://cdn.jsdelivr.net/npm/left-pad/+esm
```

You can use the `--bypass-csp` option to have `shot-scraper` run the browser in a mode that ignores these headers:

```
shot-scraper javascript github.com "
  async () => {
    await import('https://cdn.jsdelivr.net/npm/left-pad/+esm');
    return 'content-security-policy ignored' }
" --bypass-csp
```

Output:

```
"content-security-policy ignored"
```

5.4 Running JavaScript from a file

You can also save JavaScript to a file and execute it like this:

```
shot-scraper javascript datasette.io -i script.js
```

Or read it from standard input like this:

```
echo "document.title" | shot-scraper javascript datasette.io
```

5.5 Using this for automated tests

If a JavaScript error occurs, a stack trace will be written to standard error and the tool will terminate with an exit code of 1.

This can be used to run JavaScript tests in continuous integration environments, by taking advantage of the `throw "error message"` JavaScript statement.

This example uses [GitHub Actions](#):

```
- name: Test page title
  run: |-
    shot-scraper javascript datasette.io "
      if (document.title !== 'Datasette') {
        throw 'Wrong title detected';
      }"
```

5.6 Example: Extracting page content with Readability.js

[Readability.js](#) is “a standalone version of the readability library used for Firefox Reader View.” It lets you parse the content on a web page and extract just the title, content, byline and some other key metadata.

The following recipe imports the library from the [Skypack CDN](#), runs it against the current page and returns the results to the console as JSON:

```
shot-scraper javascript https://simonwillison.net/2022/Mar/24/datasette-061/ "
async () => {
  const readability = await import('https://cdn.skypack.dev/@mozilla/readability');
  return (new readability.Readability(document)).parse();
}"
```

The output looks like this:

```
{
  "title": "Datasette 0.61: The annotated release notes",
  "byline": null,
  "dir": null,
  "lang": "en-gb",
  "content": "<div id=\"readability-page-1\" class=\"page\"><div id=\"primary\">\n\n\n\n↪\n\n<p>I released ... <this is a very long string>",
  "length": 8625,
  "excerpt": "I released Datasette 0.61 this morning\u2014closely followed by 0.61.1.\n↪to fix a minor bug. Here are the annotated release notes. In preparation for Datasette_\n↪1.0, this release includes two potentially \u2026",
  "siteName": null
}
```

See [Extracting web page content using Readability.js and shot-scraper](#) for more.

5.7 shot-scraper javascript –help

Full `--help` for this command:

```
Usage: shot-scraper javascript [OPTIONS] URL [JAVASCRIPT]

Execute JavaScript against the page and return the result as JSON

Usage:

  shot-scraper javascript https://datasette.io/ "document.title"

To return a JSON object, use this:

  "({title: document.title, location: document.location})"

To use setInterval() or similar, pass a promise:

  "new Promise(done => setInterval(
    () => {
```

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```

    done({
      title: document.title,
      h2: document.querySelector('h2').innerHTML
    });
  }, 1000
));"
```

If a JavaScript error occurs an exit code of 1 will be returned.

Options:

-i, --input FILENAME	Read input JavaScript from this file
-a, --auth FILENAME	Path to JSON authentication context file
-o, --output FILENAME	Save output JSON to this file
-r, --raw	Output JSON strings as raw text
-b, --browser [chromium firefox webkit chrome chrome-beta]	Which browser to use
--browser-arg TEXT	Additional arguments to pass to the browser
--user-agent TEXT	User-Agent header to use
--reduced-motion	Emulate ' prefers-reduced-motion ' media feature
--log-console	Write console.log() to stderr
--fail	Fail with an error code if a page returns an HTTP error
--skip	Skip pages that return HTTP errors
--bypass-csp	Bypass Content-Security-Policy
--auth-password TEXT	Password for HTTP Basic authentication
--auth-username TEXT	Username for HTTP Basic authentication
--help	Show this message and exit.

SAVING A WEB PAGE TO PDF

The `shot-scraper pdf` command saves a PDF version of a web page - the equivalent of using `Print -> Save to PDF` in Chromium.

```
shot-scraper pdf https://datasette.io/
```

This will save to `datasette-io.pdf`. You can use `-o` to specify a filename:

```
shot-scraper pdf https://datasette.io/tutorials/learn-sql \
-o learn-sql.pdf
```

You can pass the path to a local file on disk instead of a URL:

```
shot-scraper pdf invoice.html -o invoice.pdf
```

6.1 `shot-scraper pdf --help`

Full `--help` for this command:

```
Usage: shot-scraper pdf [OPTIONS] URL
```

Create a PDF of the specified page

Usage:

```
shot-scraper pdf https://datasette.io/
```

Use `-o` to specify a filename:

```
shot-scraper pdf https://datasette.io/ -o datasette.pdf
```

You can **pass** a path to a file instead of a URL:

```
shot-scraper pdf invoice.html -o invoice.pdf
```

Options:

<code>-a, --auth FILENAME</code>	Path to JSON authentication context file
<code>-o, --output FILE</code>	
<code>-j, --javascript TEXT</code>	Execute this JS prior to creating the PDF
<code>--wait INTEGER</code>	Wait this many milliseconds before taking the

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```
screenshot
--media-screen      Use screen rather than print styles
--landscape         Use landscape orientation
--format [Letter|Legal|Tabloid|Ledger|A0|A1|A2|A3|A4|A5|A6]
                    Which standard paper size to use
--width TEXT        PDF width including units, e.g. 10cm
--height TEXT       PDF height including units, e.g. 10cm
--scale FLOAT RANGE Scale of the webpage rendering [0.1<=x<=2.0]
--print-background Print background graphics
--log-console       Write console.log() to stderr
--fail              Fail with an error code if a page returns an
                    HTTP error
--skip              Skip pages that return HTTP errors
--bypass-csp        Bypass Content-Security-Policy
--silent            Do not output any messages
--auth-password TEXT Password for HTTP Basic authentication
--auth-username TEXT Username for HTTP Basic authentication
--help              Show this message and exit.
```

DUMPING THE HTML OF A PAGE

The `shot-scraper html` command dumps out the final HTML of a page after all JavaScript has run.

```
shot-scraper html https://datasette.io/
```

Use `-o filename.html` to write the output to a file instead of displaying it.

```
shot-scraper html https://datasette.io/ -o index.html
```

Add `--javascript SCRIPT` to execute custom JavaScript before taking the HTML snapshot.

```
shot-scraper html https://datasette.io/ \
  --javascript "document.querySelector('h1').innerText = 'Hello, world!'"
```

7.1 Retrieving the HTML for a specific element

You can use the `-s SELECTOR` option to capture just the HTML for one specific element on the page, identified using a CSS selector:

```
shot-scraper html https://datasette.io/ -s h1
```

This outputs:

```
<h1>
  
</h1>
```

7.2 `shot-scraper html --help`

Full `--help` for this command:

```
Usage: shot-scraper html [OPTIONS] URL

Output the final HTML of the specified page

Usage:

    shot-scraper html https://datasette.io/
```

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Use `-o` to specify a filename:

```
shot-scraper html https://datasette.io/ -o index.html
```

Options:

<code>-a, --auth FILENAME</code>	Path to JSON authentication context file
<code>-o, --output FILE</code>	
<code>-j, --javascript TEXT</code>	Execute this JS prior to saving the HTML
<code>-s, --selector TEXT</code>	Return outerHTML of first element matching this CSS selector
<code>--wait INTEGER</code>	Wait this many milliseconds before taking the snapshot
<code>--log-console</code>	Write console.log() to stderr
<code>-b, --browser [chromium firefox webkit chrome chrome-beta]</code>	Which browser to use
<code>--browser-arg TEXT</code>	Additional arguments to pass to the browser
<code>--user-agent TEXT</code>	User-Agent header to use
<code>--fail</code>	Fail with an error code if a page returns an HTTP error
<code>--skip</code>	Skip pages that return HTTP errors
<code>--bypass-csp</code>	Bypass Content-Security-Policy
<code>--silent</code>	Do not output any messages
<code>--auth-password TEXT</code>	Password for HTTP Basic authentication
<code>--auth-username TEXT</code>	Username for HTTP Basic authentication
<code>--help</code>	Show this message and exit.

DUMPING OUT AN ACCESSIBILITY TREE

The `shot-scraper accessibility` command dumps out the Chromium accessibility tree for the provided URL, as JSON:

```
shot-scraper accessibility https://datasette.io/
```

Use `-o filename.json` to write the output to a file instead of displaying it.

Add `--javascript SCRIPT` to execute custom JavaScript before taking the snapshot.

8.1 `shot-scraper accessibility --help`

Full `--help` for this command:

```
Usage: shot-scraper accessibility [OPTIONS] URL
```

```
Dump the Chromium accessibility tree for the specifed page
```

```
Usage:
```

```
    shot-scraper accessibility https://datasette.io/
```

```
Options:
```

```
-a, --auth FILENAME    Path to JSON authentication context file
-o, --output FILENAME
-j, --javascript TEXT   Execute this JS prior to taking the snapshot
--timeout INTEGER      Wait this many milliseconds before failing
--log-console           Write console.log() to stderr
--fail                 Fail with an error code if a page returns an HTTP error
--skip                 Skip pages that return HTTP errors
--bypass-csp           Bypass Content-Security-Policy
--auth-password TEXT   Password for HTTP Basic authentication
--auth-username TEXT   Username for HTTP Basic authentication
--help                 Show this message and exit.
```


USING SHOT-SCRAPER WITH GITHUB ACTIONS

shot-scraper was designed with GitHub Actions for screenshot automation in mind.

9.1 shot-scraper-template

The [shot-scraper-template](#) template repository can be used to quickly create your own GitHub repository with GitHub Actions configured to take screenshots of a page and write it back to the repository. Read [Instantly create a GitHub repository to take screenshots of a web page](#) for details.

9.2 Building a workflow from scratch

This Actions workflow can be used to install shot-scraper and its dependencies, take screenshots defined in the `shots.yml` file in that repository and then write the resulting screenshots back to the same repository:

```
name: Take screenshots

on:
  push:
  workflow_dispatch:

permissions:
  contents: write

jobs:
  shot-scraper:
    runs-on: ubuntu-latest
    steps:
      - uses: actions/checkout@v3
      - name: Set up Python 3.10
        uses: actions/setup-python@v3
        with:
          python-version: "3.10"
      - uses: actions/cache@v3
        name: Configure pip caching
        with:
          path: ~/.cache/pip
          key: ${{ runner.os }}-pip
      - name: Cache Playwright browsers
```

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```
uses: actions/cache@v3
with:
  path: ~/.cache/ms-playwright/
  key: ${{ runner.os }}-playwright
- name: Install dependencies
  run: |
    pip install shot-scraper
    shot-scraper install
- name: Take shots
  run: |
    shot-scraper multi shots.yml
- name: Commit and push
  run: |-
    git config user.name "Automated"
    git config user.email "actions@users.noreply.github.com"
    git add -A
    timestamp=$(date -u)
    git commit -m "${timestamp}" || exit 0
    git pull --rebase
    git push
```

The `actions/cache@v3` steps set up [caching](#), so your workflow will only download and install the necessary software the very first time it runs.

9.3 Optimizing PNGs using Oxipng

You can losslessly compress the PNGs generated using `shot-scraper` by running them through [Oxipng](#). Add the following steps to the beginning of your workflow to install Oxing:

```
- name: Cache Oxipng
  uses: actions/cache@v3
  with:
    path: ~/.cargo/
    key: ${{ runner.os }}-cargo
- name: Install Oxipng if it is not installed
  run: |
    which oxipng || cargo install oxipng
```

Then after running `shot-scraper` add this step to compress the images:

```
- name: Optimize PNGs
  run: |-
    oxipng -o 4 -i 0 --strip safe *.png
```

[simonw/datasette-screenshots](#) is an example of a repository that uses this pattern.

See [Optimizing PNGs in GitHub Actions using Oxipng](#) for more on how this works.

CONTRIBUTING

To contribute to this tool, first checkout the code. Then create a new virtual environment:

```
cd shot-scraper
python -m venv venv
source venv/bin/activate
```

Or if you are using pipenv:

```
pipenv shell
```

Now install the dependencies and test dependencies:

```
pip install -e '.[test]'
```

Then you'll need to install the Playwright browsers too:

```
shot-scraper install
```

To run the tests:

```
pytest
```

Some of the tests exercise the CLI utility directly. Run those like so:

```
tests/run_examples.sh
```

10.1 Documentation

Documentation for this project uses [MyST](#) - it is written in Markdown and rendered using Sphinx.

To build the documentation locally, run the following:

```
cd docs
pip install -r requirements.txt
make livehtml
```

This will start a live preview server, using [sphinx-autobuild](#).

The CLI `--help` examples in the documentation are managed using [Cog](#). Update those files like this:

```
cog -r docs/*.md
```

10.2 Tweeting the release notes

After pushing a release, I use the following to create a screenshot of the release notes to use in a tweet:

```
shot-scraper https://github.com/simonw/shot-scraper/releases/tag/0.15 \  
  --selector '.Box-body' --width 700 \  
  --retina
```

Example tweet.

SHOT-SCRAPER

A command-line utility for taking automated screenshots of websites

For background on this project see [shot-scraper: automated screenshots for documentation, built on Playwright](#).

11.1 Documentation

- [Full documentation for shot-scraper](#)
- [Tutorial: Automating screenshots for the Datasette documentation using shot-scraper](#)
- [Release notes](#)

11.2 Get started with GitHub Actions

To get started without installing any software, use the [shot-scraper-template](#) template to create your own GitHub repository which takes screenshots of a page using `shot-scraper`. See [Instantly create a GitHub repository to take screenshots of a web page](#) for details.

11.3 Quick installation

You can install the `shot-scraper` CLI tool using `pip`:

```
pip install shot-scraper
# Now install the browser it needs:
shot-scraper install
```

11.4 Taking your first screenshot

You can take a screenshot of a web page like this:

```
shot-scraper https://datasette.io/
```

This will create a screenshot in a file called `datasette-io.png`.

Many more options are available, see [Taking a screenshot](#) for details.

11.5 Examples

- The [shot-scraper-demo](#) repository uses this tool to capture recently spotted owls in El Granada, CA according to [this page](#), and to generate an annotated screenshot illustrating a Datasette feature as described in [my blog](#).
- The [Datasette Documentation](#) uses screenshots taken by `shot-scraper` running in the [simonw/datasette-screenshots](#) GitHub repository, described in detail in [Automating screenshots for the Datasette documentation using shot-scraper](#).
- Ben Welsh built [@newshomepages](#), a Twitter bot that uses `shot-scraper` and GitHub Actions to take screenshots of news website homepages and publish them to Twitter. The code for that lives in [palewire/news-homepages](#).
- [scrape-hacker-news-by-domain](#) uses `shot-scraper javascript` to scrape a web page. See [Scraping web pages from the command-line with shot-scraper](#) for details of how this works.
- Reuters uses `shot-scraper` to generate regularly updating data dashboards [for email newsletters](#).