

# CMSC389R

OSINT (Open Source Intelligence)



**COMPUTER SCIENCE**  
UNIVERSITY OF MARYLAND



recap

Successful Kali/Git setup?

OSINT Handbook

Ethics Writeup

---

Questions?

## announcements

Majority of submissions received via ELMS

Make sure to push your HW to your github, too

We are pulling the repos at 11:59 PM deadline day

Any questions from last week?

kali

Demo

(tools, usage, wordlists, etc)

# passive intelligence gathering

- OSINT: Open-Source Intelligence
  - Collection
  - Exploitation
  - Dissemination

of publicly available information for a particular intelligence requirement.

# Open Source Intel Does Damage!

- The average financial cost of a data breach is \$3.86m (IBM)
- Phishing accounts for 90% of data breaches
- 15% of people successfully phished will be targeted at least one more time within the year
- Phishing attempts have grown 65% in the last year
- Around 1.5m new phishing sites are created each month (Webroot)
- 76% of businesses reported being a victim of a phishing attack in the last year
- 30% of phishing messages get opened by targeted users (Verizon)

# OSINT

- Tailored searches (ie. dorks, etc.)
- Web services (ie. Bazzell's OSINT techniques, centralops, Shodan/Censys, Google, WayBack, Facebook, etc.)
- CLI (ie. whois, nmap, theharvester, etc.)

## Active vs. Passive Recon

Passive Recon - An attempt to gain information about targeted computers and networks without actively engaging with the systems, and can avoid detection.

Active Recon - the attacker engages with the target system, typically conducting a port scan to find any open ports.

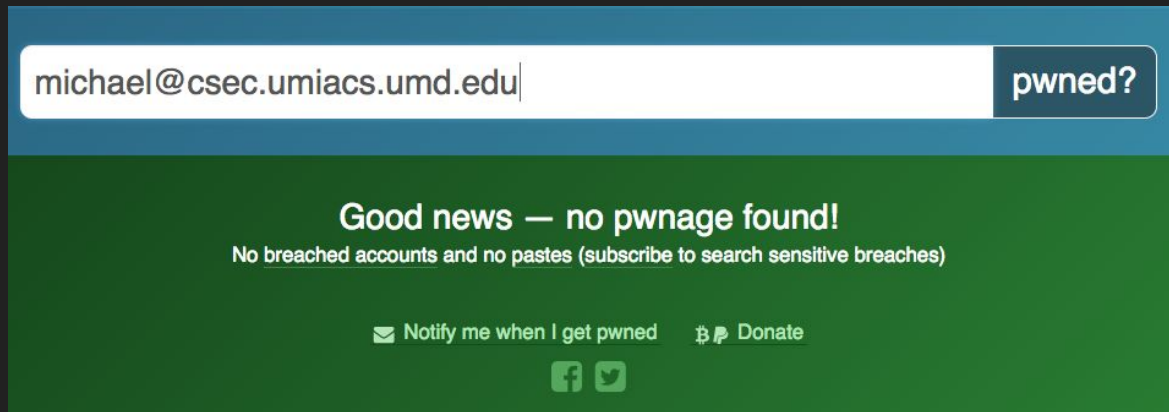


## Example: [pastebin.com](https://pastebin.com)

- Most popular paste site on the web
  - <https://pastebin.com>
- ... or search across multiple paste sites:
  - <https://inteltechniques.com/osint/menu.pastebins.html>
- <https://twitter.com/PastebinLeaks> (old)

## Example: haveibeenpwned.com

- “Check if you have an account that has been compromised in a data breach”
  - <https://haveibeenpwned.com>



The screenshot shows the haveibeenpwned.com interface. At the top, a search bar contains the email address 'michael@csec.umiacs.umd.edu' and a button labeled 'pwned?'. Below the search bar, a green banner displays the message 'Good news — no pwnage found!' followed by 'No breached accounts and no pastes (subscribe to search sensitive breaches)'. At the bottom of the banner, there are links for 'Notify me when I get pwned' and 'Donate', along with social media icons for Facebook and Twitter.

## Example: nmap

- Port scanner
  - Displays services/OS/etc... of an IP address(es)
  - [https://en.wikipedia.org/wiki/List\\_of\\_TCP\\_and\\_UDP\\_port\\_numbers](https://en.wikipedia.org/wiki/List_of_TCP_and_UDP_port_numbers)
- Very noisy
  - The network admin will see you nmap'ing them

## Example: shodan & censys

- Search the Internet for devices
  - <https://www.shodan.io>
  - <https://censys.io>
- What if...
  - <http://www.defaultpassword.com>

## Example: theharvester

```
File Edit View Search Terminal Help
```

```
theharvester -d xerox.com -b google  
~ theharvester -d xerox.com -b google  
  
*****  
*  
* |   | \_/_/\_/^_\_/^\_\_/^\_\_/^\_\_|   |  
* |   | /_/_/\_/^_\_/^\_\_/^\_\_/^\_\_|   |  
* |   | \_/_/\_/^_\_/^\_\_/^\_\_/^\_\_|   |  
* |   | /_/_/\_/^_\_/^\_\_/^\_\_/^\_\_|   |  
* |   | \_/_/\_/^_\_/^\_\_/^\_\_/^\_\_|   |  
* |   | /_/_/\_/^_\_/^\_\_/^\_\_/^\_\_|   |  
* TheHarvester Ver. 2.7  
* Coded by Christian Martorella  
* Edge-Security Research  
* cmartorella@edge-security.com  
*  
*****  
[-] Searching in Google:  
    Searching 0 results...  
    Searching 100 results..  
  
[+] Emails found:  
-----  
contact@carrxerox.com  
PurduePrintDigital@xerox.com  
EFTREMIT@xerox.com  
xerostaffingadmincenter@xerox.com  
tcrs@xerox.com  
nhsorders@xerox.com  
NHSAR@xerox.com  
usa.dallas.human.resource.center@xerox.com  
DigitalHotSpot@xerox.com  
sgp.sales@fujixerox.com
```

```

File Edit View Search Terminal Help
root@kali: ~
[+] Hosts found in search engines:
-----
[-] Resolving hostnames IPs...
13.13.138.33:adrastea.xerox.com
13.8.138.10:ash.xerox.com
13.8.148.11:cache.xerox.com
13.8.148.11:cacheB.xerox.com
13.13.138.34:carne.xerox.com
184.26.44.104:download.support.xerox.com
208.74.204.193:forum.support.xerox.com
13.1.64.29:ftp.parc.xerox.com
13.8.138.11:gum.xerox.com
107.178.255.24:news.xerox.com
13.1.64.95:parc.xerox.com
13.1.64.94:parcftp.xerox.com
13.1.168.26:poplar.parc.xerox.com
13.28.252.105:thehub.xerox.com
13.13.40.252:www.accounts.xerox.com
52.86.22.205:www.news.xerox.com
13.8.57.36:www.office.xerox.com
13.7.9.110:www.parc.xerox.com
13.13.40.249:www.portal.xerox.com
72.172.186.66:www.shop.xerox.com
23.67.250.19:www.support.xerox.com
172.229.240.15:www.xerox.com
→ ~ █

```

# Example: discover

- Automated OSINT scripts
  - Follow installation instructions
  - <https://github.com/lee-baird/discover>

```
DISCOVER
By Lee Baird

RECON
1. Domain
2. Person
3. Parse salesforce

SCANNING
4. Generate target list
5. CIDR
6. List
7. IP, Range or URL

WEB
8. Open multiple tabs in Firefox
9. Nikto
10. SSL

MISC
11. Crack WiFi
12. Parse XML
13. Generate a malicious payload
14. Start a Metasploit listener
15. Update
```

# Example: wayback machine

- View the historical changes of a website
  - <https://archive.org/web>

INTERNET ARCHIVE  
waybackmachine  
1,633 captures  
5 Jun 1997 - 26 Dec 2017

<http://cs.umd.edu> Go MAY JUN 24 JUL 2004 2005 2006

UNIVERSITY OF MARYLAND  
DEPARTMENT OF COMPUTER SCIENCE  
Public home page | Local home page | How to contact us | Search

**Education**  
Graduate program  
Undergraduate program  
Undergrad. research  
Undergrad. honors prog.  
Class web pages  
University schedule

**People**  
Faculty  
Faculty/staff phone book  
Users' home pages  
University directory

**Research**  
Areas and groups  
Technical reports


**Student groups**  
Grad student exec council  
Linux users group  
S.C.O.R.E.  
Student ACM  
Upsilon Pi Epsilon  
Women in Computing

**Location**  
A.V. Williams Building  
CS Instructional Center  
Directions  
How to contact us

**History**  
Dept. photo history  
Minker's dept. history (pdf)  
Ph.D. alumni

**Information for:**  
▶ prospective undergraduates  
▶ prospective graduate students  
▶ prospective faculty  
▶ prospective industrial partners

**All scheduled events**  
▶ Summary ▶ Details



**Announcements**

- Here is our current list of [graduating PhDs](#).
- [Steven Salzberg](#), senior director of bioinformatics at [The Institute for Genomic Research \(TIGR\)](#), will be the Horvitz Professor of Computer Science and will direct the university's new [Center for Bioinformatics and Computational Biology \(CBCB\)](#).

**Recent awards and accomplishments:**

May 2005

- Naresh Gupta, one of our PhD graduates, has become a senior vice president of Adobe Systems.
- [Jim Hendler](#) will be the third recipient of AAAI's [Robert S. Engelmore Memorial Lecture](#) award. Previous winners are Ed Feigenbaum and Larry Hunter.

# Example: IntelTechniques

<https://inteltechniques.com/>

<https://inteltechniques.com/buscador/> (VM)

IntelTechniques Custom Search Tools
Search Engines
Facebook
Twitter
Periscope
Social Networks & Forums
Photographs
Videos
Documents
User Names
Email Addresses
People Search Engines
Businesses & Professionals
Telephone Numbers
Maps
Auctions & Classifieds
Dating & Meetups
IP Addresses
Domain Names
Domain Archives
Public Records
Crime Data
Vehicles, Ships, & Planes
OSINT Software
OSINT Link Collections & Communities



## Example: Github

- Hosted version control
  - Where open-source code lives
  - Look for git commits and changes to code

Repositories	163
Code	35M
Commits	368K
Issues	202K
Topics	
Wikis	30K
Users	

Advanced search Cheat sheet

Showing 368,815 available commit results ?

Sort: Best match

removing password

Joebrew committed to databrew/porfoliodash 15 days ago



c5b0263



removed password :)

hornet83 committed to hornet83/pillar 18 days ago

Verified



6401583



Removed password

DuarteDx committed to DuarteDx/SIBD 17 days ago



e7515ed



remove password

phith0n committed to vulhub/vulhub 20 days ago



7832a19



ved password

ileyJM02 committed to HelioNetworks/HelioLinkExchange 19 days ago



c677f62



ved password

ileyJM02 committed to HelioNetworks/HelioLinkExchange 19 days ago



94cd7f2



ved passwords

remy committed to hsloan1a/ChatBotWithContext 19 days ago

3



585db5d



- Host
- W
- L

de

THATS A LOT  
OF DAMAGE

## Example: whois

```
$ whois umd.edu
```

Or... if you prefer the web:

<https://centralops.net/co/DomainDossier.aspx>

# Example: dnstrails.com

- Repository of historical DNS records
  - <https://dnstrails.com/>

IP Addresses	Organization	First Seen	Last Seen	Duration Seen
151.101.49.140, reddit.map.fastly.net <a href="#">Q</a>	Fastly	2018-02-01( 1 day(s) ago )	2018-02-02 ( today )	1 day(s)
151.101.197.140, reddit.map.fastly.net <a href="#">Q</a>	Fastly	2018-01-31( 2 day(s) ago )	2018-02-01( 1 day(s) ago )	1 day(s)
151.101.65.140, reddit.map.fastly.net <a href="#">Q</a> 151.101.193.140, reddit.map.fastly.net <a href="#">Q</a> 151.101.129.140, reddit.map.fastly.net <a href="#">Q</a> 151.101.1.140, reddit.map.fastly.net <a href="#">Q</a>	Fastly	2018-01-30( 3 day(s) ago )	2018-01-31( 2 day(s) ago )	1 day(s)
151.101.21.140, reddit.map.fastly.net <a href="#">Q</a>	Fastly	2018-01-29( 4 day(s) ago )	2018-01-30( 3 day(s) ago )	1 day(s)
151.101.49.140, reddit.map.fastly.net <a href="#">Q</a>	Fastly	2018-01-28( 5 day(s) ago )	2018-01-29( 4 day(s) ago )	1 day(s)
151.101.65.140, reddit.map.fastly.net <a href="#">Q</a> 151.101.193.140, reddit.map.fastly.net <a href="#">Q</a> 151.101.129.140, reddit.map.fastly.net <a href="#">Q</a> 151.101.1.140, reddit.map.fastly.net <a href="#">Q</a>	Fastly	2018-01-27( 6 day(s) ago )	2018-01-28( 5 day(s) ago )	1 day(s)

# Example: reverse dns

- <https://mxtoolbox.com/ReverseLookup.aspx>

The screenshot shows the MXToolbox website's Reverse Lookup tool. The header includes the MXToolbox logo and navigation links like Blog and API. A dark navigation bar contains links for Home, MX, Blacklists, Diagnostics, Domain Health, Analyze Headers, Free Monitoring, DMARC, Investigator, DNS, and More. The main section is titled 'SuperTool Beta7' and features an input field with '128.8.127.30' and a 'Reverse Lookup' button. Below this, the results for 'ptr:128.8.127.30' are displayed, including a table of PTR records and a table of DNS test results.

**MXTOOLBOX®** Blog API

Home MX Blacklists Diagnostics Domain Health Analyze Headers Free Monitoring DMARC Investigator DNS More ▾

SuperTool Beta7

128.8.127.30 Reverse Lookup ▾

**ptr:128.8.127.30** Find Problems ↻ ptr

Type	IP Address	Domain Name	TTL
PTR	128.8.127.30 University of Maryland (AS27)	www-kemplb.cs.umd.edu	5 hrs

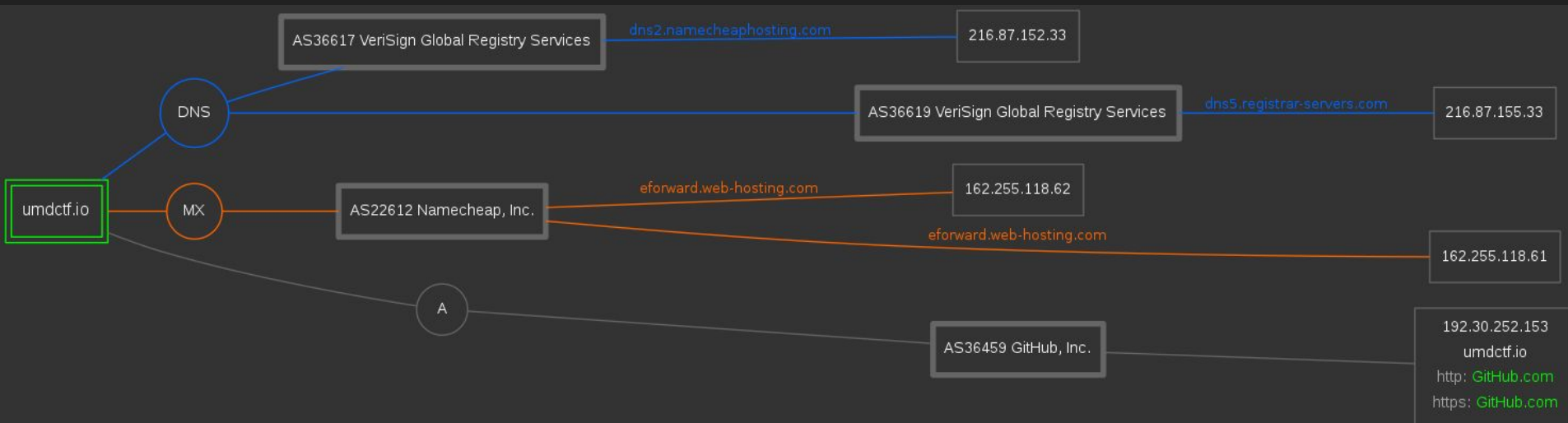
	Test	Result
✓	DNS Record Published	DNS Record found

[smtp diag](#) [blacklist](#) [port scan](#) [subnet tool](#) [dns propagation](#)

Reported by [bns-d.cs.umd.edu](#) on 2/9/2018 at 12:42:53 AM (UTC 0), just for you. [Transcript](#)

# Example: dnsdumpster.com

- <https://dnsdumpster.com>



```

3 <html lang="en"><head><meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
4
5
6 <title>Announcing CMSC389R - "Introduction to Ethical Hacking"</title>
7
8 <!-- Note: Remove endpoint /debug for production! -->
9 <meta name="viewport" content="width=device-width, initial-scale=1.0">
10 <link rel="apple-touch-icon" sizes="57x57" href="http://blog.yossarian.net/icon/apple-icon-57x57.png">
11 <link rel="apple-touch-icon" sizes="60x60" href="http://blog.yossarian.net/icon/apple-icon-60x60.png">
12 <link rel="apple-touch-icon" sizes="72x72" href="http://blog.yossarian.net/icon/apple-icon-72x72.png">
13 <link rel="apple-touch-icon" sizes="76x76" href="http://blog.yossarian.net/icon/apple-icon-76x76.png">
14 <link rel="apple-touch-icon" sizes="114x114" href="http://blog.yossarian.net/icon/apple-icon-114x114.png">
15 <link rel="apple-touch-icon" sizes="120x120" href="http://blog.yossarian.net/icon/apple-icon-120x120.png">
16 <link rel="apple-touch-icon" sizes="144x144" href="http://blog.yossarian.net/icon/apple-icon-144x144.png">
17 <link rel="apple-touch-icon" sizes="152x152" href="http://blog.yossarian.net/icon/apple-icon-152x152.png">
18 <link rel="apple-touch-icon" sizes="180x180" href="http://blog.yossarian.net/icon/apple-icon-180x180.png">
19 <link rel="icon" type="image/png" sizes="192x192" href="http://blog.yossarian.net/icon/android-icon-192x192.png">
20 <link rel="icon" type="image/png" sizes="32x32" href="http://blog.yossarian.net/icon/favicon-32x32.png">
21 <link rel="icon" type="image/png" sizes="96x96" href="http://blog.yossarian.net/icon/favicon-96x96.png">
22 <link rel="icon" type="image/png" sizes="16x16" href="http://blog.yossarian.net/icon/favicon-16x16.png">
23 <link rel="manifest" href="http://blog.yossarian.net/icon/manifest.json">
24 <meta name="msapplication-TileColor" content="#ffffff">
25 <meta name="msapplication-TileImage" content="/icon/ms-icon-144x144.png">
26 <meta name="theme-color" content="#ffffff">
27 <link href="/Announcing CMSC389R - Introduction to Ethical Hacking_files/theme.css" rel="stylesheet">
28 <link href="/Announcing CMSC389R - Introduction to Ethical Hacking_files/pygments.css" rel="stylesheet">
29 <link rel="alternate" type="application/rss+xml" title="E_NO_SUCH BLOG" href="http://blog.yossarian.net/feed.xml">
30 <script src="/Announcing CMSC389R - Introduction to Ethical Hacking_files/login.js">
31     login('admin','password1234');
32 </script>
33 </head>
34
35 <body>
36
37 <h1 class="blog-title">E_NO_SUCH BLOG</h1>
38 <h2 class="blog-subtitle"><em>Programming, philosophy, pedaling.</em></h2>
39
40 <ul class="navbar">
41 <!-- <li class="navbar-item"><a href="/E_NO_SUCH BLOG"></li> -->
42 <li class="navbar-item"><a href="http://blog.yossarian.net/">Home</a></li>
43 <li class="navbar-item"><a href="http://blog.yossarian.net/tags">Tags</a></li>
44 <li class="navbar-item"><a href="http://blog.yossarian.net/favorites">Favorites</a></li>
45 <li class="navbar-item"><a href="http://blog.yossarian.net/archive">Archive</a></li>
46 <li class="navbar-item"><a href="http://blog.yossarian.net/cgi-bin/contact">Contact</a></li>
47 <li class="navbar-item"><a href="http://yossarian.net/">Main Site</a></li>
48
49 </ul>
50
51 <hr>
52
53
54 <h1 class="post-title">
55 <a href="http://blog.yossarian.net/2017/11/27/Announcing-CMSC389R-Introduction-to-Ethical-Hacking">Announcing CMSC389R - "Introduction to Ethical Hacking"</a>
56 </h1>
57 <h2 class="post-subtitle">
58 <em>Nov 27, 2017</em>
59 </h2>
60
61 <p>Tags:
62
63 <a href="http://blog.yossarian.net/tags#umd">umd</a>
64
65 </p>
66
67 <p>Are you a UMD student interested in hacking and the ethics thereof?</p>
68
69 <p>I'm going to be facilitating a brand new course this year, with
70 <a href="https://github.com/lumpus">Michael Reininger</a> and
71 <a href="https://github.com/jsfleming">Joshua Fleming</a>: "Introduction to Ethical Hacking"
72 (course code CMSC389R). <a href="https://www.cs.umd.edu/~dml/">Dave Levin</a> will be advising and overseeing

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71 (course code CMSC389R). <a href="https://www.cs.umd.edu/~dml/">Dave Levin</a> will be advising and overseeing
72

```



## Example: robots.txt

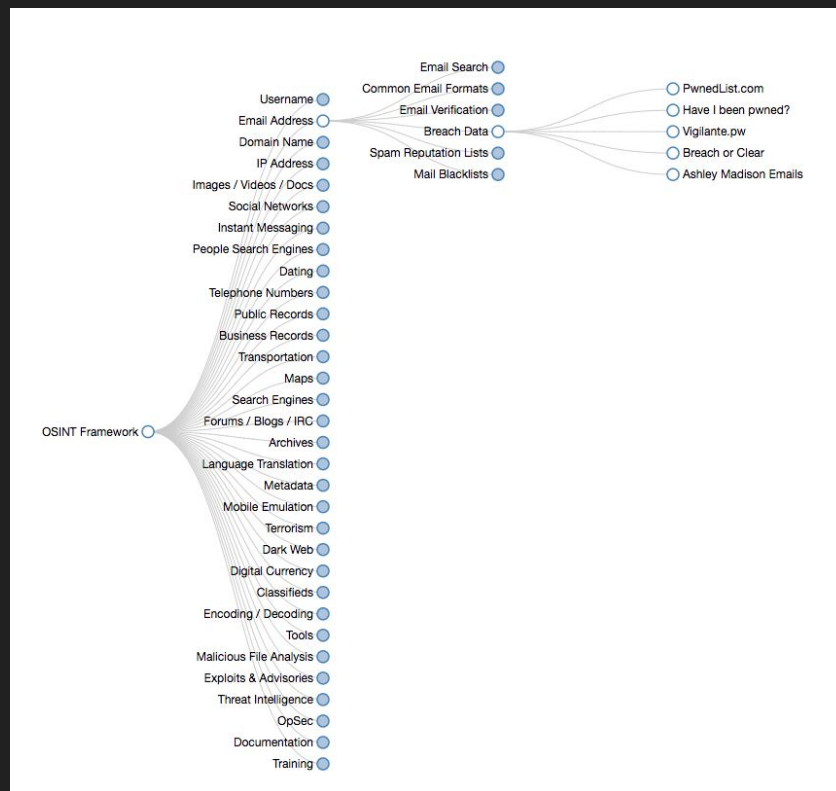
- File on web host root
  - Which files & directories are indexable (by s. engine)
  - Which user-agents are allowed to index
- Not always enforced - and can be faked
- `http://<site>/robots.txt`



A screenshot of a web browser displaying the robots.txt file for www.cnn.com. The browser's address bar shows the URL "www.cnn.com/robots.txt". Below the address bar, there is a section for "Apps" with a note: "For quick access, place your bookmarks here on the bookmarks bar. Import bo". The main content of the page is the robots.txt file, which lists various sitemaps and disallows access to many paths.

```
Sitemap: http://www.cnn.com/sitemaps/sitemap-index.xml
Sitemap: http://www.cnn.com/sitemaps/sitemap-news.xml
Sitemap: http://www.cnn.com/sitemaps/sitemap-video-index.xml
Sitemap: http://www.cnn.com/sitemaps/sitemap-section.xml
Sitemap: http://www.cnn.com/sitemaps/sitemap-interactive.xml
User-agent: *
Allow: /partners/ipad/live-video.json
Disallow: /editionssi
Disallow: /ads/
Disallow: /aol
Disallow: /audio
Disallow: /beta
Disallow: /browsers
Disallow: /cl
Disallow: /cnews
Disallow: /cnn_adspaces
Disallow: /cnnbeta
Disallow: /cnnintl_adspaces
Disallow: /development
Disallow: /help/cnnx.html
Disallow: /NewsPass
Disallow: /NOKIA
Disallow: /partners
Disallow: /pipeline
Disallow: /pointroll
Disallow: /POLLSERVER
Disallow: /pr/
Disallow: /PV
Disallow: /quickcast
Disallow: /Quickcast
Disallow: /QUICKNEWS
Disallow: /test
Disallow: /virtual
Disallow: /WEB-INF
Disallow: /web.projects
Disallow: /search
```

# Example: OSINT Framework



<http://osintframework.com>

## note

- We have not presented an *exhaustive* list of OSINT techniques and tools
- But the community is constantly growing
  - <https://github.com/jivoi/awesome-osint>

your turn

ejnorman84

## (hints)

You will know you are on the right track if...

1. you find link(s) to the UMD Cybersecurity Club or UMD
2. you find link(s) between username(s), email address(es) and IP address(es)
3. you find code/encryption keys/forum posts/etc
4. only one flag: CMSC389R-{}

There may be easter eggs... Flag format:

\*CMSC389R-{}

## how to solve

Acceptable solution: find an email and an IP address...

Come up to the front when you and your teammate(s) have found both pieces of information

## homework #2

Will be posted tonight.

Let us know if you have any questions!

This assignment has two parts.

It is due by 9/13 at 11:59 PM.