



# A Student Observatory for Cybersecurity Education Research

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## Intro & Problem

- Capture The Flag (CTF) & cybersecurity education
  - CTF: competition where individual students or teams solve cybersecurity challenges
  - CTFs are educational
  - Students rely on online resources to learn important concepts
  - BUT: CTF not friendly for beginners-how and why? how student assess sites they visited? What kinds of information students can access on the Web?
- Research Questions
  1. What are students searching for when completing CTF challenges?
  2. What online resources are students using to solve CTF challenges?
  3. Are the available resources understandable and transferable to the challenge context? Do they support better learning?
  4. What elements are missing from the online CTF resources, and what could we add?


# Approach

- Design and Host CTF challenges
  - problem types, depths of vulnerability in code, presence of mitigation
- Develop an observatory → chrome extension
  - Examine student browsing behaviors while completing CTF
  - URLs, search terms, time stamps, percentage of page viewed (passive)
  - Short survey each page (active)
  - Preserve student privacy
- Post-Study survey
  - Search term rating, prior experience with each challenge type, use of non-browser resources
- Web Scraper
  - Types of pages visited, how connected are these pages?

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Please rate the following:

**00:00:19**

Was this a website related to CTF challenge?

★ Not at All Related

★ Slightly Related

★ Somewhat Related

★ Moderately Related

★ Extremely Related

Was it helpful for solving the problem?

★ Not at All Helpful

★ Slightly Helpful

★ Somewhat Helpful

★ Moderately Helpful

★ Extremely Helpful

Was this website understandable?

★ Not at All Understandab

★ Slightly Understandab

★ Somewhat Understandab

★ Moderately Understandab

★ Extremely Understandab

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## Conclusion

- Ongoing study and currently has not experimented, no data available yet
- The tool is used to monitor the online resources used and their perceptions of these resources
  - The observatory may be able to apply in other studies monitoring browsing behaviors
- We thank Google for supporting this research





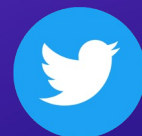
# Thank You



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