CSE 523S
Systems Security

Week 1:
Course Introduction

Fall 2024

Professor Patrick Crowley

Plan for Today

- Course introduction
- Administrivia
- Assignment

A bit about me

arl.wustl.edu/~pcrowley/

WELCOME RESEARCH TEACHING BIO CONTACT

Welcome

Patrick Crowley

I am Professor of Computer Science & Engineering at Washington University where I direct the Applied Research Laboratory (ARL). I am also the founder of Observable Networks, which was acquired by Cisco Systems in 2017. My interests span networking and computer systems, and much of my teaching and research has involved programmable networked systems, high-speed networking, network security, and information-centric networking.

Research

techcrunch.com/2017/07/13/cisco-acquires-network-security-startup-observable-networks/

Cisco acquires network security startup Observable Networks

Ingrid Lunden @ingridlunden / 7:38 AM CDT • July 13, 2017

Family man, two main hobbies

Golf

General Aviation

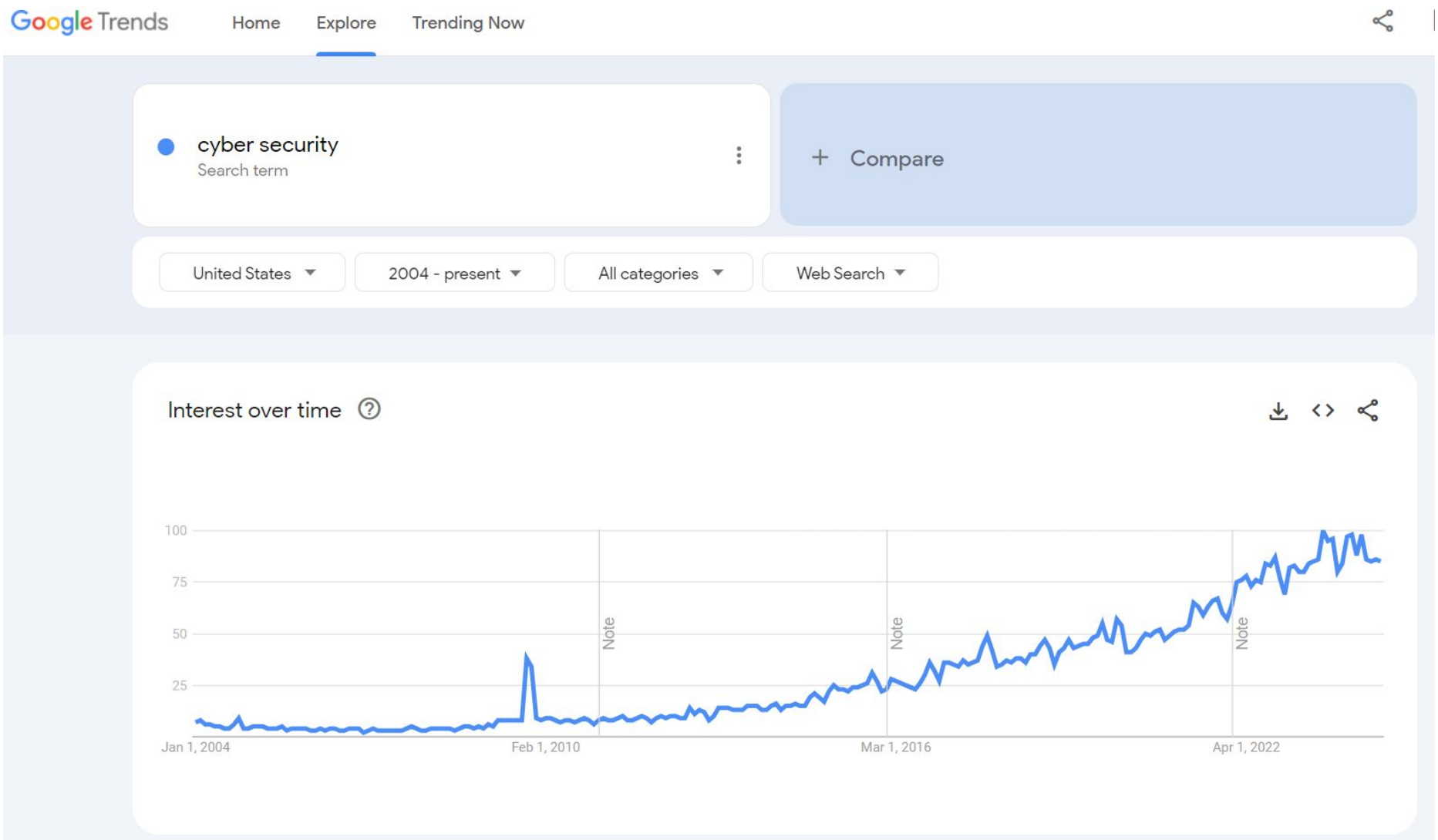

Helsinki

Why should you take CSE 523?

Why Systems Security? Why Now?

- Security is a top-tier societal issue
  - Health, Energy, Security, …
  - Often a popular news topic, especially with elections
- "Cyber Security" is key in the Information Age
  - All digital systems can be hacked. All information is digital. Thus, all information can be hacked.
- All systems and applications should be
  1. Correct
  2. Performant
  3. Secure
- CSE has a historical focus on 1 & 2 but not on 3!

Evergreen: Relevant now & later



Security is often subjective

Objective evaluation

Subjective evaluation

Common Cybersecurity threats

- Phishing/Social engineering attacks (often via email)
  - Steal credentials for financial gain
- Ransomware
- Less common but very dangerous
  - zero-day malware exploits

All of those are the result of existing **vulnerabilities**:

- Users
- Software
- Networks

Where is the problem?

- But what is our role?
  - **Can we prevent or minimize the number of vulnerabilities?**

- **We** are a crucial component of this problem! We need to increase our awareness!
  - We = Users must be aware of the security implications of their actions.
  - **We = Computer Scientists must be aware of the security implications of the code they implement.**
  - We = CS Educators must include security awareness in the core CS curriculum.

CSE 523S Description

- Focus: Computer design choices dictate security
- Goal of course is to establish:
  - Understanding of interaction between computer design and security consequences
  - Literacy in the language and tools of modern systems security
  - Proficiency in exploiting known vulnerabilities
  - Ability to identify new vulnerabilities and develop corresponding exploits
  - Proficiency in detecting and stopping known exploits

- Some topics we will go deep into, some we will brush the surface.

How We Will Work

- You will learn in this class from experience.
- Labs and homeworks are where the real learning will come.

- Suggestions
  1. Be kind with yourselves
  2. Let us know if you struggle
  3. Don’t fall behind

Logistics

General logistics

- Most weeks will consists of
  - A lecture on Monday
  - A studio/lab on Wednesday

- Laptops/computers are **Required**!
  - We can get you one if needed

- Exams: No exams, but we will have a few quizzes.

- **CSE 361 pre-req: many students succeed w/out it!**

- Course Webpage: Canvas, let's take a look!

Assignments

- Homework Assignments
  - You are expected to complete all homework assignments on your own!
- Studios - Total of 10 or so studios
  - You can work with others on most studios.
- Reading Assignments:
  - Will be published in the modules.
- Presentations
  - See next slide

Presentations

- This is a 500 level class!
  - Find a topic, an incident or recent security news and present it to the class. (~15 minutes).
  - We will provide a list of topics to choose from.
  - Aim to make it a discussion and ask open-ended questions
  - ~~6 students will present in each lecture reserved for student presentations.~~
    - presentations will be pre-recorded and posted on discussion boards.

Final Grades

- Letter grades will likely be assigned based on the typical 10 point grading scale.
  - 90-100 is an A, 80-89 is a B, and so forth.
  - If needed, grades will be normalized.
  - + and – will be added within 2 points of a boundary.
    - For example, 80-81 will be a B-, 82-87 will be a B, and 88-89 will be a B+.
- For students taking the course pass/fail, a grade of a C or better is a passing grade.

Regrade Policy

- You'll submit reports that document your work.
  - The graders will grade your work and will determine if someone else can follow your instructions and get the same result.
- You'll have a week from the "grades are now posted" message to submit regrade requests
  - All regrade requests should be privately sent to me and the TAs on Piazza.
  - Be specific with your request.

Regrade Policy (2)

- We sometimes make mistakes. The regrade procedure is intended to correct errors in grading, and to point on inconsistencies.
- Please don’t use it as an opportunity to argue about each judgment call made by the graders.
- When we regrade, we look at the entire assignment again.

Assignment

- You have some tasks to complete on Canvas
  - Welcome Quiz is assigned, due soon
  - HW1 is assigned, due before lab
  - Reading assignment for next class

- This an easy week - make sure you understand the logistics and requirements of the course.