ECS 289M Winter Quarter 2022
Introduction to Research in Computer Security

Let's Get the Hard Stuff Out of the Way

- Adding the class
  - The department policy controls who gets PTAs; it is available at https://cs.ucdavis.edu/graduate/current-students/faqs-current-grads (scroll down to Registration; the third question is "How do I get a PTA for a class?")
  - I can only issue PTAs in accordance with those directions (ie, only when *the department* asks me).

General Information

- Who we are
  - Instructor: Matt Bishop, office hours: *to be arranged*

- Goals:
  - Learn about research in computer security;
  - Study a real-world problem under a mentor whose organization has proposed the problem;
  - Learn to work as a member of a research team;
  - Learn how to shape a research project to have goals achievable in a limited time; and
  - Be exposed to people and organizations doing cutting-edge work in computer security.

General Information

- Prerequisites
  - Each student must have the ability, background, and motivation to carry out original research in cybersecurity and information assurance.
  - Students are expected to have a good background in computer science and some knowledge of computer security.
  - Each student is expected to bring significant expertise, interest, and experience in at least one relevant technical area.

General Information

- Class Web Site
  - It's on Canvas; log in there, and go to ECS 289M
  - If you don't have access and need it, please email me and I will add you
    - This *does not* mean you will be admitted to the course!
  - Backup web site: http://nob.cs.ucdavis.edu/classes/ecs289m-2022-12

- A 2-Quarter Class
  - Students are expected and encouraged (but not required!) to sign up for ECS 289M in Spring Quarter
  - Projects take more than 1 quarter to complete

General Information

- General UC Davis resources
  - Cover health and wellness, virtual classroom fatigue, etc.
  - You can also come to me and I will either help or suggest where you can get help
  - Web site: https://ebeler.faculty.ucdavis.edu/resources/faq-student-resources/
- Academic integrity
  - Paramount!!! And plagiarism is a violation of academic integrity
  - Follow the UC Davis Code of Academic Conduct
    - Available at https://ossja.ucdavis.edu/code-academic-conduct
  - I report cheating to the Office of Student support and Judicial affairs; they handle it appropriately

COVID and the University

- Participate in the university's daily screening process by completing a [Daily Symptom Survey](#).

- Participate in the university's testing program.

- Wear a well-fitted face covering that covers your nose and mouth at all times.

- Monitor the daily potential exposure report.

- Assist in the contact tracing process.

For more information, go to [the Campus Ready web site](#).

INSuRE Project

- Focal activity: cybersecurity research class

  - INSuRE stands for INformation Security Research and Education

- Sponsors propose problems

  - If selected, sponsor expected to provide guidance, feedback students in conjunction with faculty

  - Sponsor must agree that, if results merit publication, the research can be published

    - So far, no problems with doing this

Overview of Structure

1. Project bid

2. Project proposal

3. Literature review

4. Progress report and presentation

5. Final report, presentation for schools on semester system
   • Penultimate report, presentation for quarter system

6. Final report, presentation for schools on quarter system

Set-Up

- Faculty solicit research proposals from (potential) sponsors
  - Typically, a paragraph describing problem in general terms
  - Examples
    - Identifying ICS components in a network
    - Code variation as a defense against attacks
    - Analysis of proposed TCPcrypt protocol

- Sponsors then "pitch" the projects to the students
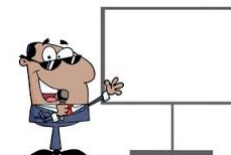
Research

- Students meet weekly with sponsor, faculty to report progress, challenges encountered and overcome, next week's goals

- Goals may change based on challenges found
  - Allow sponsors to modify incremental research goals
  - Sponsors can apply intermediate results as work progresses
  - Students see their work being used

Reports
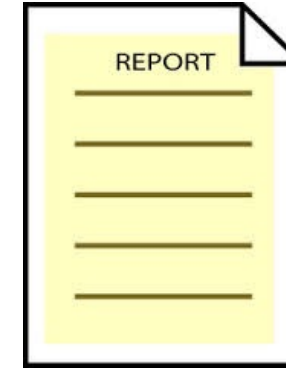
- Weekly progress reports
- Midterm progress report
  - Delivered as formal paper, presentation to all participating teams
- Final report
  - Also delivered to all teams
- Critical idea: document results, tools, datasets so that another team can pick up where this team left off
  - Teaches data curation

Reports and Dashboards

- Due at 11:55pm on the due date, unless stated otherwise

- Submit it on Canvas
  - I'll give you comments and grades on Canvas too
  - None of this will be on the secondary web site; only on Canvas

- Don't be wishy-washy in your write-up!

- Write it in good English; be clear and concise
  - An example of a good answer is on the web site

- Submit Powerpoint or PDF *only*; do *not* submit other formats!

Class

- Zoom fatigue

- Recordings
  - So if you are in a different time zone and can't attend class, you can see the recordings

- Asking questions: speak up!
  - You can raise your hand and I will unmute you
  - You can ask in the chat room and I will answer