CS 772/872: Advanced

Computer and Network Security

Fall 2022

Course Link:

https://shhaos.github.io/courses/CS872/netsec-fall2022.html

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OLD DOMINION UNIVERSITY

Instructor – Shuai Hao

- **Ph.D.,** 2017 -- College of William and Mary, Williamsburg, VA
- **Postdoc,** 2018 – 2019 – CAIDA, UC San Diego, La Jolla, CA
- **Research**
  - Applying measurement, empirical study, and data-driven approach to (1) understand Internet underlying Infrastructure and (2) to develop enhancement to improve Internet performance, robustness, and security
    - Internet Topology
    - Internet Routing System
    - Domain Name System
    - Content Delivery Networks
    - Web Security and Privacy
    - Online Fraud
    - Underground E-Commerce
    - Cybercrime

What this course is …

- **Graduate-level course**
- **Study classical and latest relevant research problems**
  - Reading Research Papers
    - Reviewing/ Presenting papers
  - Writing Report

What this course is NOT …

- **Listening-and-learning**
- **Textbook knowledge**
- **Knowledge-based Exam**

- **Fundamental Background will be introduced**

Why CS 772/872?

- **Credits / Requirements**
- **Advanced Topics**
  - Sitting on the frontier of popular research area

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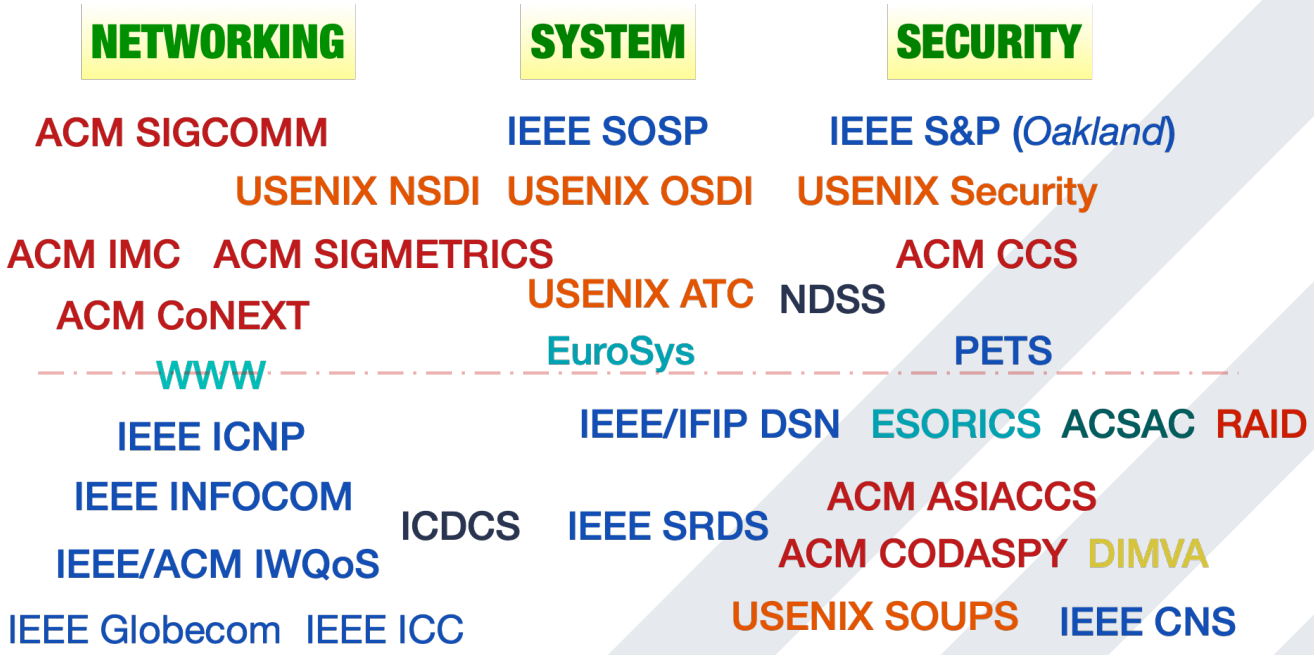
- **Credits / Requirements**
- **Advanced Topics**
  - Sitting on the frontier of popular research area
- **Computer and Network Security**
  - *Classical* & *Emerging* Research area
  - *Fundamental* & *practical* problems that are related to most areas of development

Resources

- **Premier Conferences in Networking & Security**



Course Workloads

- **Course Presentations**
  - Teach us
- **Paper Reviews**
  - Gain Insights & practice your duty
- **Final Report**
  - Write a paper/survey

Paper Review

- **Summarize the main idea**
  - Problem they solved
  - Approach they took (what's the novelty)
  - How did they evaluate
- **Pros & Cons:** Which parts you like & don't like
  - Methodology? Reasonable Experiment design? Solid results?
- **Any ways to improve the work**

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- **Real public conference reviews**
  - ACM IMC 2011 - 2013

Sample1, Sample2

Presentation

- **Basic Presentation Structure**
  - Motivation of the work
  - Technical background
  - Proposed approaches/Major contribution
  - Evaluation results/discussion
  - Conclusion and Extension
- **You could do more**
  - History/evolution of relevant techniques
  - Comparison/complementary study
  - Following work

Presentation

- **Colloquium-style Presentations**
  - ~60 mins + discussion
  - Using your own slides
  - Including course information, original authors, and the presenter in your title page
- **Need to see more well-presented seminar talks?**
  - Stanford NetSeminar
    - https://www.youtube.com/channel/UCDjWhwewESyX335Rp6B1PEw
  - Cornell-Princeton Center for Network Programming
    - https://www.youtube.com/channel/UCCPScZgIFYxuuqj8IsPpgeQ

Final Report

- **A formal technical paper**
  - Using formal IEEE or ACM conference template
  - Writing with Latex!
- **Progress**
  - Define your topic: problem statement
  - Paper structure

  } First Due (10/11)

  - Preliminary results
  - Final report

  } Final Due

  - **A final presentation of your report at last lecture (~5 min)**

Final Report

- **Do a research**
  - Analysis / Assessment
  - Measurement
  - Prototyping
- **Optional: Pursue a joint project with other course**
  - Getting approval from the other instructor
  - Schedule a joint meeting with both instructors to present your idea

Final Report

- **Examples of projects**
  - UC Berkeley CS 261N: Internet/Network Security
    - http://www.icir.org/vern/cs261n/project.html
  - MIT 6.875: Computer and Network Security
    - http://courses.csail.mit.edu/6.857/2016/projects

Final Report

- **Survey Paper**
  - Comprehensive and thoughtful literature survey of a particular topic
  - Touching the State-of-the-art
  - Connecting to your potential research interests

Sample1, Sample2

Final Report

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> **Systematization of Knowledge (SoK)**
>
> - Introduced by IEEE Security and Privacy since 2010
> - Collection of SoK papers from IEEE Security and Privacy
>   - https://oaklandsok.github.io/

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