# Tufts Cybersecurity Clinic

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# Motivation

- Governments of all level (small, state, and federal), non-profits, and small business have struggled with cyberattacks for far too long, growing worse each year.
- For well over a decade, there has been a significant shortage in the cybersecurity workforce
  - "private sector leaders and the federal government have not been able to make the meaningful investments necessary to fill the more than half a million current vacancies nationwide, including more than 33,000 vacancies in the public sector workforce alone."
- There are over 300+ cybersecurity centers in the United States; how can a Tufts Cybersecurity Center stand out?
- JumboCode, a student organization at Tufts University that develops software pro-bono for nonprofit clients, has been oversubscribed for the last few years.

# Mission Statement

The Tufts University Cybersecurity Clinic offers a wide range of Cybersecurity services to the Medford, Somerville, Cambridge, and Greater Boston communities pro bono.  Services include business continuity planning, risk mitigation, source code review, vulnerability assessments, and penetration testing.  The Clinic provides real experience and training for students to become future leaders in the field.  The clinic leverages the University's strong tradition of public service.

# For Whom (Clients)

- Phase 1
  - 501(c) non-profit organizations
    - Hospitals
    - Charities
    - K-12 schools
  - Local and state government, the Commonwealth of Massachusetts
- Phase 2
  - Small businesses in the Medford, Somerville, Cambridge, Greater Boston Area

# Services To Be Offered

- Low Risk
  - Business continuity planning
  - Security training
  - Risk mitigation
  - Inventory cyber assets
  - Update privacy policies
- Medium Risk
  - Vulnerability assessments
  - Network configuration
  - Source code analysis and review
  - Building honeypots
  - Upgrade to two-factor authentication (2FA) or universal second factor (U2F)
- High Risk
  - Penetration testing

# Services That Are Prohibited

- Break into an Facebook/Instagram/[insert service here] account
- Unlock a mobile device
- Launch an *external* attack against [insert target here]
- Reverse engineer a product/system/software
- Malware development and analysis
- Exploit development
- Forensics
- Incident handling

# Prerequisites For Students

- Absolute requirement: must have taken CS 116 Introduction to Security and have earned at least an "A-"
- One of the following:
  - Have taken at least one Humanities course at Tufts
  - Member of the JumboSec Student Organization
  - Enrolled in the Cyber Security Policy Program
  - Enrolled in the Science, Technology, and Society (STS)-CS Co-Major
  - Double-majoring in CS + another non-STEM field
  - Evidence of significant work or interest in a non-CS/Math field (e.g., healthcare, law, business)
- Open to undergraduate and graduate students, including online students
- Students will need to complete a short application to enroll

# The Course

- One or two semesters (ideally 2), 3.0 SHUs per semester –offered in fall and spring semesters
- Can substitute Senior or Master's Capstone
- 30 students maximum per semester
- Each project shall be done in teams of 4-6 students, ideally interdisciplinary teams
- Each project shall have a confidentiality agreement and hold-harmless agreements signed by client and team of students

# Course Syllabus

- From https://www.citizenclinic.io/clinic-curriculum/syllabus
- Code of Conduct
- Rules of Engagement a.k.a., "Rules of the Road"
- Requirements Elicitation
- NIST Risk Management Framework
- Risk Assessment
- Information Gathering and Analysis, OSINT
- Social Engineering and Phishing Simulations
- Harassment and Post-Traumatic Stress Disorder (PTSD)
- Clinic Core Hours / Team Check-in

# Needs, Part 1: To Meet With Immediately, In Order

1. *Jeff Foster, CS Chair*
   a. *Then Jeff can bring this to Kyongbum Lee, Dean of Engineering*
2. *Susan Landau*
3. *Lorna Koppel, CISO at Tufts*
   a. *3A: Chris Sedore, CIO at Tufts*
4. *University Counsel, namely Mary Jeka and Akiyo Fujii*
5. Caroline Genco, Provost at Tufts
6. Tisch College
7. Samantha Fried and Joe Auner at Science, Technology, and Society (STS)
8. JumboSec Student Organization

# Needs, Part 2: Rollout Plan

1.  Present plan to Susan, Lorna, and to University Counsel (summer 2023)
2.  Create website for Cybersecurity Center with a section for the Cybersecurity Clinic (fall 2023)
3.  Create short application for students (fall 2023)
4.  Announce Cybersecurity Clinic opening via Tufts Daily (fall 2023)
5.  Announce Cybersecurity Clinic to the MassCyberCenter (fall 2023)
6.  Announce and solicit customers in early fall 2023 for spring 2024
7.  Open Cybersecurity Clinic and course in spring 2024

# Needs, Part 3: Equipment

- Laptops for engagements
- Virtual Private Networks (VPNs)
- Cloud services (e.g., to install VPNs, VMs)

# Value Proposition

- For students: gain real working experience; work in interdisciplinary teams
- For Tufts: build stronger relationships with the Greater Boston, Somerville, and Medford communities; aligns with "public good" strategic plan
- For the community: receive Cybersecurity services that are generally unaffordable and require expertise
- For the Commonwealth of Massachusetts and beyond: addition of a clinic, Cybersecurity workforce development
- Modest investment necessary –not "no cost" but also not high cost

# Acknowledgements

# Appendix: List of College/University Cybersecurity Clinics

- UC Berkeley
- MIT
- Indiana University
- University of Alabama
- University of Georgia
- Rochester Institute of Technology
- Stillman College
- Columbia SIPA
- University of Nevada, Las Vegas
- University of Texas, Austin and San Antonio

# References

1. https://www.lawfareblog.com/how-start-cybersecurity-clinic
2. https://cybersecurityclinics.org/
3. https://www.lawfareblog.com/improving-cyber-oriented-education-one-cyber-clinic-time
4. https://www.citizenclinic.io/clinic-curriculum/syllabus
5. https://gist.github.com/mchow01/9569350f3b975ce84dad68f0d95c4579