CPSC 490 Proposal

An Evaluation of Yale’s Cybersecurity Infrastructure

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March 17, 2019

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1. Overview

Technology and computers exist all around us. We rely heavily on these machines for a variety of tasks ranging from entertainment to sensitive data storage. These devices are necessary for our academic survival in the 21st century. We spend on average about 5 hours a day connected to the internet and many more hours offline on these devices.\(^1\) We use these devices to communicate with friends and family but also with professors and students. A student is expected to check their email at least a few times a day; it is also the norm to check texts and other forms of instant messaging at least once every few waking hours. We store our assignments, our data for our classes but also our personal, private data on the devices that have become ubiquitous.

Cybercrimes are on the rise globally. It is believed that cybercrime cost the world economy as much as $600 billion in 2017 alone.\(^2\) In the past cybercrimes were committed only by experts in the field. Today, any person with internet access can download a set of tools that would

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\(^1\) https://www.telegraph.co.uk/news/2018/08/01/decade-smartphones-now-spend-entire-day-every-week-online/
allow him/her to gain unauthorized access to a system. Although technology is everywhere, people seem to remain unaware of the dangers and vulnerabilities that it entails. They refuse to update their software to patch a security flaw, passwords are overwhelmingly weak simply because it is a nuisance to take the necessary precautions.

2. Goals

There are two main objectives to this senior project relating to cybersecurity at Yale.

1. Create a program that would perform a personal security audit on a student’s laptop. This program would identify the vulnerabilities (if any) in a student’s computer and give a comprehensive and human readable message detailing how it should be fixed.

2. Create a comprehensive (hopefully mandatory) guide/tutorial for Yale students and perhaps students more generally on safe internet and cyber usage. This would be similar to the alcohol awareness course that incoming students have to take before coming to Yale. After having figured out some of the flaws and deficiencies of the system, I would then create a guide tailored for a Yale student’s needs.

I believe that both these objectives are important to increase the cybersecurity on campus. The biggest threat to cybersecurity is the human factor. The education of students at Yale about the correct practices necessary is therefore paramount for a successful cybersecurity policy.
3. Implementation

The security audit program, called CyberSafe, would examine the security of a person’s personal computer. It would, for example, check whether the video camera and microphone are currently in use (the camera light can be disabled, leaving the user vulnerable). It would also check to see if the person’s computer is being remotely accessed. The implementation for these and other features will be aimed at computers produced by Apple (considering the number of Apple computers at Yale and the false belief that they are immune to vulnerabilities).

The program would give clear and concise human understandable instructions before and after being run. These instructions, alongside the guide would explain to the user if their laptop is secure. It would tell the user how to act in the case that the laptop is not secure. In addition, it would give the user general instructions and best practices so as to make sure that the user is informed and aware of the safest practices.

CyberSafe will be a shell script that the user would click on to run. Since this is the only action required by the user, the script will run and the result will appear in a terminal window. This might sound counterintuitive since the point of CyberSafe is to ensure the security of a non-expert student. However, since no interaction is needed between the user and the terminal, a terminal window (specifically with a black background) might give the user a greater sense of emergency and authenticity therefore further compelling him to act as instructed and bettering his personal cybersecurity.
## 4. Deliverables/Schedule

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<tr>
<th>Dates</th>
<th>Deliverables</th>
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<tr>
<td><em>Weeks 1–2:</em></td>
<td>• Begin work on script and have a basic working beginning of a CyberSafe</td>
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<tr>
<td></td>
<td>program.</td>
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<td>• First draft of the guide for safe cyber usage.</td>
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<td><em>Week 3:</em></td>
<td>• Second CyberSafe program with all features (and probably bugs).</td>
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<td>• Second draft of the guide with images and feedback from ‘civilian’ students.</td>
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<td><em>Week 4-End:</em></td>
<td>• Final CyberSafe with and features and no bugs.</td>
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<td>• Final guide with feedback taken into consideration.</td>
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