CornellX - ENGRI1280x: Wiretaps to Big Data

Spring 2014 Syllabus

March 2, 2014-May 11, 2014

Instructional team

Dr. Stephen Wicker, Professor of Electrical and Computer Engineering, Cornell University
Teaching Assistant: Stephanie Santoso

About the course

How does cellular technology enable massive surveillance? Do users have rights against surveillance? How does surveillance affect how we use cellular and other technologies? How does it affect our democratic institutions? Do you know that the metadata collected by a cellular network speaks volumes about its users? In this course you will explore all of these questions while investigating related issues in WiFi and Internet surveillance. The issues explored in this course are at the intersection of networking technology, law, and sociology and will appeal to anyone interested in the technical, political, and moral questions inherent in the use of information networks. The course will include broad overviews for the novice, while pointing to the detailed resources needed for those engaged in the development of corporate or governmental policies.

There are no prerequisites for this course.

What will the successful students be able to do after taking this course?

This course explores the privacy issues of an interconnected world. Participants who successfully complete the course and its assignments should be able to:

- Explain the basic function of cellular telephone networks, WiFi, and other networking technologies.
- Explain the evolution of privacy rights through the U.S. constitution's 4th amendment, particularly as applied to content and context surveillance.
- Identify types of cryptography used to secure wired and wireless networks.
- Consider the implications of different forms of surveillance and how they impact an individual's privacy in society.
- Evaluate contemporary surveillance and security decisions/laws.
- Increase their ability to apply ethical thinking and judgment to a wide range of privacy and surveillance situations.
- Interpret how using complex and powerful technologies to collect personal data can impact individuals, corporations, markets, and societies.

The current UTC date and time are:

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<th>Week (Content available)</th>
<th>Topics</th>
<th>Readings</th>
<th>Assignment</th>
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<th>Topic</th>
<th>Resources</th>
<th>Assignment</th>
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| March 2, 2014 | Introduction: Technology, Privacy, and the Interconnected World | Jonathan Strickland "How Does the Internet Work?"  
Marshall Brain, Tracy V. Wilson and Bernadette Johnson, "What is WiFi?"  
http://computer.howstuffworks.com/wireless-network1.htm  
Wiki project:  
Wikipedia: Good_articles  
Wikipedia: Good_article_criteria | Introduce yourself on the discussion board and respond to one other person. Create a portrait of yourself in any medium, digitize the portrait and share the link on the discussion board. Wiki assignment (250 words) and word cloud posting |
| March 9, 2014 | Cellular Convergence                   | "NSA collecting phone records of millions of Verizon customers daily"  
http://www.theguardian.com/world/2013/jun/06/nsa-phone-records-verizon-court-order | Wiki assignment (250 words) Post an abstract to the course wiki |
| March 16, 2014 | Internet and WiFi                       | G. S. Hans, "Should Your ISP Monitor What You Do With Your Internet Service?"  
"A brief history of Wi-Fi," The Economist, Jun 10, 2004. | Wiki assignment (250 words) Post an abstract to the course wiki |
http://groups.csail.mit.edu/mac/classes/6.805/articles/privacy/Privacy_brand_warr2.html  
Wiki Project:  
Editing and Proofreading  
http://writingcenter.unc.edu/handouts/editing-and-proofreading/  
Writing Tips: 5 Editing Principles  
http://www.cws.illinois.edu/workshop/writers/tips/editing | Wiki assignment (250 words) Post an abstract to the course wiki |
<table>
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<th>Date</th>
<th>Topic</th>
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<th>Wiki Assignment</th>
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<tbody>
<tr>
<td>March 23, 2014</td>
<td>The Impact of Privacy Invasion</td>
<td>How your smartphone is putting your identity at risk</td>
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<td>Post an abstract to the course wiki</td>
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<td>April 6, 2014</td>
<td>Cryptology and the Art of Secret Communication</td>
<td>&quot;Introduction to Public Key Cryptography&quot;</td>
<td>Peer Review Calibration and Wiki Assignment (750 words)</td>
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Optional Wikipedia assignment materials

Read:
- Wikipedia on Wikipedia
- Wikipedia: Starting An Article
- Wikipedia: Writing Better Articles
- Wikipedia Good Articles
- Wikipedia Good Articles Criteria

Watch:
- The History of Wikipedia
- How to Write a Wikipedia Article

Sign up for a Wikipedia account, which will allow you to revise and edit articles.

Contribute to Wikipedia

Certificate/grading

Grade of 70% needed for certificate

- What Do You Think (Pre test questions): 0%
- Post test (question at the end of a unit): 1%
- Questions in the sections (video subject matter questions and Test Case): 80%
- Wiki assignments (self-assessed preparation): 0%
- Wiki Assignments (3 peer-reviewed): 9%
- Final exam: 10%

Course components and activities

Below is a description of the course components and activities. Generally each subsection begins with a short introduction to the topics that will be discussed and contains readings, videos, a "what do you think" question, in-line "check your understanding" questions and links. The end of each subsection will have a summary of what was covered, a quiz, discussion questions and a Wiki Project writing assignment.

- Text The subsections and videos are framed with text. You should read through the text as it will help you understand what is/was covered in a video. Occasionally some supplemental text will be available that explore the concepts in more depth.
• *What Do You Think?/Pre-Test* at the beginning of each subsection you will be asked to take a guess on an initial "What Do You Think" question. This question will be repeated and graded at the end of the subsection.

• *Videos* A lot of the content for the course is in the subsections videos. Each subsection will contain several short videos. As you watch these videos you should take notes and work through the inline questions, pausing the video if necessary. In most videos it may be helpful to view the videos in full screen mode so you can see the text and images woven into the video in a larger format. You will also have the option of pausing videos or watching them at faster speeds. See the video control bar below.

• *Links* Links to additional information will be provided. These resources are supplemental and provided for you to further delve into topics. If Professor Wicker wants you to read or review materials that will be clearly indicated.

• *Check Your Understanding questions* Questions will be asked throughout the subsections for you to check your understanding of the video content. At the end of each subsection there will be a quiz. These questions are meant to help you check your own understanding of the concepts that were covered in a video.

• *Discussion boards* Discussion boards are a great place to talk about ideas and concepts from the subsections with others. In some subsections prompts or questions will be provided for you to discuss with others in the course on these boards. These conversations can clear up misconceptions and are a great place to get questions answered. If no questions are provided we ask that you write a post that aims to enrich the course content/reading of a fellow student who is both intelligent and attentive to the course or share “news of the week” – interesting happenings around the world related to cellular privacy and surveillance and include links. General guidelines for discussion board participation are given later in the General discussion boards section located at the bottom of the left navigation bar.

• *Conclusion questions* The conclusion questions give you practice with the concepts that were just covered in the subsection. They will be found at the end of each subsection. All of the questions will be multiple choice but some may be harder to solve.

**Who should take this course?**

This course is accessible to anyone. The primary reasons to take this course are to:

• Better understand how U.S. privacy law has made it possible for current information technologies to be used to collect data and conduct surveillance.

• Explore design solutions to change cellular surveillance.

• Whatever your motivations, if you complete the course and its assignments you’re sure to have a better understanding of how cell phones collect data and why this data can be used in U.S. courts.
What are the students expected to do for successful completion of the course?

Why you are taking this course will impact what you decide to do and complete. A few ways to take this course are outlined below:

1. **Certificate:** You want to achieve all of the course learning outcomes described above to have a better understanding of Privacy and Surveillance in the Age of Interconnection. To do this you’ll need to watch the videos, answer the questions and complete the conclusion questions. You should go through the subsections sequentially and complete the “check your understanding” questions that are included in the subsections, usually after each video. To truly understand the material, as you watch the videos you should take notes, pausing the video if necessary. The best way to master the material is to work through it! You will probably spend about 4 hours per week on the course material.

2. **Audit:** You’re interested in seeing what cellular surveillance is about you might want to answer some of the “check your understanding” questions that are included in the subsections, and may want to attempt the conclusion questions at the end of each subsection.

3. **Peruse:** You just want to poke around and explore a few topics, but don’t want to take the whole course or complete the assignments. We would still encourage you to try some of the questions and hope that you find some material that interests you.