

EMAC 4372 / CS 4v95.007

Fall 2016

ATC 2.101, T/Th 10-11:15am

Office hours: email both instructors for appt.

Instructors:

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TAs:

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Privacy and the Internet of Things

Description:

This class explores how privacy, security, and surveillance operate in the Internet of Things (IoT). We will cover the ethical and technical dimensions of the IoT; we will also cover its social, political-economic, and cultural aspects. Key topics will include privacy and anonymity; rhetorics of security and insecurity; state and corporate surveillance; design principles (of objects and of systems); big data, data mining, and algorithms; open source vs. proprietary code; and power and social inequalities.

Course objectives:

- Develop the ability to analyze design principles in technological objects
- Collaborate in teams and across domains of knowledge
- Learn to identify an ethical, social, or political issue in design and create a solution to it

Readings:

All readings will be available online, either through a provided URL or on the class blog.

Graded components of work:

Class participation (25%): This is a small seminar designed to stimulate conversation, both between two professors from different disciplines and between students of different majors. Everyone's full engagement is required to make it work. If you have any problems with public speaking, please speak to one of us individually. We want each student to feel comfortable talking. Attendance factors into class participation. You are allowed two absences, no questions asked; after that, absences will detract from your grade. If you miss more than six class meetings, you may fail the course. Habitual tardiness will be noted, and late arrivals may count as absences.

Presentation (15%): Each student will serve once as presentation leader. The presentation will consist of a few slides to introduce an example of the topic for the day, moving into questions designed to spark discussion.

Final project (35%): For the final group project, students will work to design an IoT-related object or system and its related materials (promotional publications, social media marketing, etc.). The goal of this project is to identify current issues in IoT design, implementation, etc. and then to design

something that addresses those issues. The project will include a research component and a design component. The grade will be determined both by individual and group effort. We will discuss this more at a later point in the semester.

Reading responses/class blog (25%): Each student will be assigned to one of two groups. Each group will post to the blog on alternate days (either Monday night or Wednesday night). For the blog, you will find an example that illustrates the reading for that class and write up a one-two paragraph summary of how it intersects with our reading. You should explain how it illustrates the reading that is assigned for that particular day. Or, if you find yourself flummoxed by the reading, you may use the blog assignment as a chance to detail where your confusion lies, and any tactics you took (such as poking around online) to try to clear up your confusion. The URL for our blog is utd4372.wordpress.com. Please note: We will often use the blog responses to frame discussion, so come to class prepared to talk about it.

The fine print: You must turn in all assignments to pass the class. Any assignment turned in late will be docked points (1/3 of a letter grade) for each day it is late. All work must be your own. You may not turn in material for this class that you have turned in for other classes.

Technology policy:

No cell phone use is allowed in class (unless cell phones are required for an exercise). Laptops may be used, but anyone messaging, watching videos, or otherwise disrupting class will be asked to leave for the rest of the class and marked absent.

Schedule and readings: This schedule and readings are subject to modification at the instructors' discretion. Please always consult the class blog for the latest version of the syllabus. The latest version will *not* be on eLearning.

August 23: Introductions

In class: Wordpress invites

Sign up for presentation dates

Student introductions

August 25: What Is the IoT?

Readings:

- The AWS IoT Mega Contest! <https://www.hackster.io/contests/AWSIoTmegaContest>
- IoT Infographic, <http://www.conosco.com/infographic-the-iot-explained/>
- Center for Long-Term Cyber Security, "Intentional Internet of Things," <https://cltc.berkeley.edu/scenario/scenario-four/>
- Want, Schilit, and Jenson, "Enabling the Internet of Things," [http://www.roywant.com/cv/papers/pubs/2015-01%20\(IEEE%20Computer\)%20Enabling%20the%20Internet%20of%20Things.pdf](http://www.roywant.com/cv/papers/pubs/2015-01%20(IEEE%20Computer)%20Enabling%20the%20Internet%20of%20Things.pdf)

- Smarr, “An Evolution toward a Programmable Universe,”
<http://www.nytimes.com/2011/12/06/science/larry-smarr-an-evolution-toward-a-programmable-world.html>

Assignment: Research where data is being gathered about you on campus, at home, as you travel between the two spaces.

Blog: Groups A & B (post your response to the assignment)

August 30: Privacy: Historical and social contexts

Readings:

- Look at the lede and the image for this Wikipedia entry:
<https://en.wikipedia.org/wiki/Panopticon>
- Lepore, “The Prism, Privacy in An Age of Publicity,”
<http://www.newyorker.com/magazine/2013/06/24/the-prism>
- Eubanks, from *Digital Dead End* (Wordpress)

Blog: Group A

DEADLINE: Please see the blog for extended explanation of Managing Online Readings assignment

September 1: Privacy: Meanings, Design Principles, Power

Readings:

- Farell, “The Internet of Things -- Who Wins, Who Loses?,”
<https://www.theguardian.com/technology/2015/aug/14/internet-of-things-winners-and-losers-privacy-autonomy-capitalism>
- Wicker and Schrader, “Privacy-Aware Design Principles for Information Networks,”
http://wisl.ece.cornell.edu/wicker/SWicker_Proceedings.pdf
- Solove, “The Meaning and Value of Privacy” (Wordpress)

Blog: Group B

September 6: Rhetorics of Security/Insecurity

Readings:

- Monahan, “Introduction,” *Surveillance in a Time of Insecurity* (Wordpress)
- Micha Cardenas’s Autonets project, description here:
<https://causes.kindsnacks.com/cause/local-autonomy-networks/>
- <http://stiletto.is/>

Blog: Group A

September 8: Technical Tools to Study and Protect Privacy

Readings:

- Schneier, “Real-World Security and the Internet of Things,” https://www.schneier.com/blog/archives/2016/07/real-world_secu.html
- Security tools, <https://ssd.eff.org/en/index>
- Green, “What is Differential Privacy?” <http://blog.cryptographyengineering.com/2016/06/what-is-differential-privacy.html>

Blog: Group B

September 13: Technical Tools to Study and Protect Privacy (Continuation)

Readings:

- “Setting up Wireshark to Capture and Inspect Packets,” <http://www.howtogeek.com/104278/how-to-use-wireshark-to-capture-filter-and-inspect-packets/>
- Wireshark tutorials, <https://www.wireshark.org/#learnWS>
- Kolamunna et al., “Are Wearable Devices Ready for HTTPS? Measuring the Cost of Secure Communication Protocols on Wearable Devices,” <http://128.84.21.199/abs/1608.04180v1>
- Franceschi-Bichierai, “Inventor of The Web’s Most Terrifying Search Engine Shows us How to Use It,” <http://motherboard.vice.com/read/inventor-of-the-internets-most-terrifying-search-engine-shows-us-how-to-use-it>

In class:

- Wireshark
- Whois
- Shodan
- PGP
- Open Source vs. Closed Source

NO BLOGS

September 15: State and Corporate Surveillance

Readings:

- Lyon, “Spreading Surveillance Sites” (Wordpress)
- Prism Powerpoint, <http://www.washingtonpost.com/wp-srv/special/politics/prism-collection-documents/?hpid=z1>

- Ackerman and Thielman, “US Intelligence Chief: We Might Use the Internet of Things to Spy on You,” <https://www.theguardian.com/technology/2016/feb/09/internet-of-things-smart-home-devices-government-surveillance-james-clapper>

Blog: Group A

September 20: Design, marketing, information access

Readings:

- Werminont, “What Wearable Manufacturers Think Women Want”
http://www.slate.com/articles/technology/future_tense/2016/04/what_wearable_manufacturers_think_women_want.html

In-class:

Unboxing exercise; TOS and privacy policy exercise

Blog: Group B

September 22: Design principles

Readings:

- MIT Design Thinking, Design Theory Series, “Series Forward” (Wordpress)
- Disalvo, “Design and Agonism” (Wordpress)
- Shepard, “Near-Future Urban Archaeology: The Sentient City Survival Kit” (Wordpress)

In-class:

- <http://survival.sentientcity.net/>, especially “Under(a)ware”
- The Amazon Web Services (AWS) IoT Mega Contest,
<https://www.hackster.io/contests/AWSIoTMEgaContest>
- <http://www.wired.com/2013/01/anti-drone-camouflage-apparel/>
- More on this artist’s projects here: <https://ahprojects.com/projects/>

Blog: Group A

September 27: Big data and surveillance

Readings:

- *NYT Magazine*, “How Companies Learn your Secrets,”
<http://www.nytimes.com/2012/02/19/magazine/shopping-habits.html>
- *Forbes*, “The Internet of Things Is about Data, Not Things,”
<http://www.forbes.com/sites/moorinsights/2015/07/30/the-internet-of-things-is-about-data-not-things/#4217e73974e4>

- Zuboff, “Secrets of Surveillance Capitalism,” <http://www.faz.net/aktuell/feuilleton/debatten/the-digital-debate/shoshana-zuboff-secrets-of-surveillance-capitalism-14103616.html>
- Nafus, “The Data Economy of Biosensors,” http://link.springer.com/chapter/10.1007/978-1-4302-6014-1_7/fulltext.html

Blog: Group B

September 29: Location Tracking

Readings:

- EPIC, “Locational Privacy,” https://epic.org/privacy/location_privacy/
- EFF, “On Locational Privacy and How to Avoid Losing it Forever,” <https://www.eff.org/wp/locational-privacy>
- Clifford and Hardy, “Attention Shoppers, Stores are Tracking Your Cell,” <http://www.nytimes.com/2013/07/15/business/attention-shopper-stores-are-tracking-your-cell.html>
- <http://trackimo.com>
- Kane, “Smart Buildings Monitor Energy Efficiency, But What Are They Really Tracking?,” <https://www.theguardian.com/sustainable-business/2016/jun/14/smart-buildings-monitor-energy-efficiency-but-what-are-they-really-tracking>
- Vaas, “The ‘Spying’ Billboards That Track You As You Walk By” <https://nakedsecurity.sophos.com/2016/05/03/the-spying-billboards-that-track-you-as-you-walk-by/>

Blog: Group A

Presentations start

October 4: Self-tracking and the neoliberal subject

Readings:

- Nafus and Sherman, “This One Does Not Go Up to Eleven,” <http://quantifiedself.com/wp-content/uploads/2013/04/NafusShermanQSDraft.pdf>
- Carr, “Frederick Taylor and the Quantified Self,” <http://www.rough.type.com/?p=3888>

Blog: Group B

Device: Leaf; FitBit; Spire

October 6: Self-tracking

Readings:

- IoT, Insurance, discrimination: <http://thebaffler.com/blog/insurance-vultures-and-the-internet-of-things>
- Raij et al., "Privacy risks emerging from the adoption of innocuous wearable sensors in the mobile environment," <http://pie.eng.usf.edu/wp-content/uploads/2011/12/raij-chi2011.pdf>

To explore: <http://www.unfitbits.com/>

Blog: Group A

October 11: Consumer Domestic

Readings:

- Kofman, "Bad Housekeeping," <http://thenewinquiry.com/essays/bad-housekeeping/>
- Vaidhyanathan, "The Googlization of Us," Wordpress
- Arstechnica, "Man-in-the-Middle Attack on Vizio TVs coughs up owners' viewing habits," <http://arstechnica.com/security/2015/11/man-in-the-middle-attack-on-vizio-tvs-coughs-up-owners-viewing-habits/>

In-class: discuss student interest and potential groups for final projects

Blog: Group B

Device: Nest

October 13: Consumer Domestic: Children

Readings:

- Sadowski, "Reign of the Technonanny," <http://thenewinquiry.com/essays/reign-of-the-techno-nanny/>
- Gibbs, "Privacy Fears over 'Smart' Barbie That Can Listen to Your Kids," <https://www.theguardian.com/technology/2015/mar/13/smart-barbie-that-can-listen-to-your-kids-privacy-fears-mattel>

Deadline for list of group members

Device: Mimo; Barbie

October 18: Biometrics and CCTV

Readings:

- Wagner, "US Customs Consider Using Biometrics at Border," <http://www.kpbs.org/news/2014/feb/24/agency-considering-biometrics-border/>

- Data and Society, “Biometric Technologies in Policing,”
http://www.datacivilrights.org/pubs/2015-1027/Biometrics_Primer.pdf
- Keefe, “The Detectives Who Never Forget a Face,”
<http://www.newyorker.com/magazine/2016/08/22/londons-super-recognizer-police-force>

NO BLOG: Work on proposals

October 20: Biometrics, Power, Class

Readings:

- Magnet, “Criminalizing Poverty: Adding Biometrics to Welfare”

NO BLOG: Proposals for final project due

October 25: Digital Health/Medicine

Readings:

- Mehta, “Consumer Health Innovation Opportunities and Privacy Challenges: A View from the Trenches” (Wordpress)
- Zetter, “It’s Insanely Easy to Hack Hospital Equipment,”
<https://www.wired.com/2014/04/hospital-equipment-vulnerable/>

Blog: Group A

Device: iPhone HealthKit; Insulin pump

October 27: Digital/Health Medicine

Readings:

- Data and Society Research Institute, “Civil Rights: Health Primer,”
<http://www.datacivilrights.org/pubs/2014-1030/Health.pdf>

Blog: Group B

November 1: Open Source

Readings:

- Rogoff, “How Can Free Software Protect Us from Surveillance?,”
<https://www.fsf.org/bulletin/2013/fall/how-can-free-software-protect-us-from-surveillance>

- Tor-enabled Smart Home, https://home-assistant.io/cookbook/tor_configuration/
https://github.com/n8fr8/talks/blob/master/onion_things/Internet%20of%20Onion%20Things.pdf

Blog: Group A

November 3: Final project work

NO READINGS OR BLOG

November 8: “Smart” intimacy

Readings:

- “The Internet of Dildos Is Watching You,” <https://motherboard.vice.com/read/dildo-data-hacking>; and to accompany it, <http://www.privateplayaccord.com/>
- The Register, “Your ‘Intimate Personal Massager’ --Cough-- Is Spying on You,” http://www.theregister.co.uk/2016/08/07/your_sec_toy_is_spying_on_you_hackers_crack_our_plastic_pals/

Blog: Group A

November 10: Smart Grid Privacy

Readings:

- EPIC, Smart Grid Privacy,” <https://epic.org/privacy/smartgrid/smartgrid.html>
- Green Tech Media, “Putting Energy Disaggregation Tech to the Test,” <http://www.greentechmedia.com/articles/read/putting-energy-disaggregation-tech-to-the-test>

Blog: Group B

November 15: Transparency vs. Going Dark

Readings:

- Van Kranenburg, “From Privacy to Privacies” (Wordpress)
- Aestetix, “2014 NymRights: Protecting Identity in the Digital Age,” <https://cyber.law.harvard.edu/events/luncheon/2014/09/aestetix>

NO BLOG – work on final projects

November 17: Vehicular and Smart Transportation Privacy

Readings:

- Naked Security, “Cheaper Car Insurance Dongle Could Lead to a Privacy Wreck,” <https://nakedsecurity.sophos.com/2015/01/20/cheaper-car-insurance-dongle-could-lead-to-a-privacy-wreck/>
- Enev et al., “Automobile Driver Fingerprinting,” <http://www.autosec.org/pubs/fingerprint.pdf>
- EFF, “License Plate Readers Exposed! How Public Safety Agencies Respond to Major Vulnerabilities in Vehicle Surveillance Tech,” <https://www.eff.org/deeplinks/2015/10/license-plate-readers-exposed-how-public-safety-agencies-responded-massive>

NO BLOG – work on final projects

November 22 & 24: NO CLASS (Thanksgiving week)

November 29: Seminar to discuss project progress

December 1: Presentations/feedback

December 8: Presentations/feedback

Additional course policies:

Disability and the classroom: If you have a disability that requires a formal accommodation, please register with the Office of AccessAbility. If you suspect you have a disability, or even if you just have questions, please contact them – conversations with them are fully confidential. OSA is located in the Student Services Building, suite 3.200. They can be reached by phone at (972) 883-2098 or by email at disabilityservice@utdallas.edu.

Plagiarism: You all know the drill: do not plagiarize. This class follows the University’s policies on plagiarism, located here: <http://go.utdallas.edu/syllabus-policies>.

Sharing Confidential Information

Students considering sharing personal information in email, in person, or within assignments or exams should be aware that faculty members and teaching/research assistants are required by UT Dallas policy to report information about sexual misconduct to the UT Dallas Title IX Coordinator. Per university policy, faculty have been informed that they must identify the student to the UT Dallas Title IX Coordinator. Students who wish to have confidential discussions of incidents related to sexual harassment or sexual misconduct should contact the Student Counseling Center (972-883-2527 or after hours 972-UTD-TALK or 972-883-8255), the Women's Center (972-883-8255), a health care provider in the Student Health Center (972-883-2747), the clergyperson (or other legally recognized religious advisor) of their choice, or an off-campus resource (i.e., rape crisis center, doctor, psychologist). Students who are sexually assaulted, harassed, or victims of sexual misconduct, domestic violence, or stalking, are encouraged to directly report these incidents to the UT Dallas Police Department at 972-883-2222 or to the Title IX Coordinator at 972-883-2218.

Additional information and resources may be found at <http://www.utdallas.edu/oiec/title-ix/resources>.