



Information Privacy with Applications

ESOC 495: Special Topics, Section 001 Fall 2021

Course Time: Tue / Thu 3:30 - 4:15 PM (AZ)
Course Location: <https://hi.iiif.org/ESOC495>
Course Site: [https://sidiprojects.us/wiki/Information_Privacy_with_Applications_\(Fall_2021\)](https://sidiprojects.us/wiki/Information_Privacy_with_Applications_(Fall_2021))
Grades: Desire to Learn (D2L), <https://d2l.arizona.edu/d2l/home/1081906>
Instructor: David Sidi
Office Location: <https://hi.iiif.org/OfficeHours495>
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COURSE DESCRIPTION

Information Privacy with Applications focuses on the practical analysis and evaluation of existing privacy technologies, and on the design and implementation of new technologies. Throughout the course technical work is placed within a broader shared historical context of privacy and computing. This year the course is also integrated with two others on information privacy and security: 'Cyber Crime, Surveillance, and Policy' (PA/POL 421), and 'Cultures of Surveillance' (HNRS 205).

Sections are marked with '(*)' to indicate that all text within the section is university-mandated boilerplate required for all syllabi.

COURSE OBJECTIVES AND EXPECTED LEARNING OUTCOMES

Objectives. After taking this course, the student should be able to:

- Provide a sophisticated comparative account of how 'privacy' is used in a variety of disciplinary contexts
- Communicate a particular technology's privacy characteristics to different

audiences, including engineers, lawyers, policy makers, and a nontechnical general audience

- Analyze information privacy technologies with reference to their historical context
- Apply a refined intuition about the interactions between data and privacy as mediated by technology
- Recognize flaws in information privacy technologies, and know how to fix them
- Design and implement systems for enhancing privacy benefits and/or mitigating privacy threats, making use of existing privacy-enhancing technologies

ABSENCE AND CLASS PARTICIPATION POLICY

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: <http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>. I expect you to attend each class session, except when you email me to explain why you cannot attend.

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: <https://deanofstudents.arizona.edu/absences>

COURSE COMMUNICATIONS

Email is the preferred method for contacting me. Responses may take up to 24 hours during the week. For more urgent matters, please use the matrix room given above.

SCHEDULE

Personal and Group Privacy Technology

		Topic	Reading
08/24	Course Logistics and Introduction		none
08/26	Personal Privacy Technology I		Claudia Diaz and Seda Gürses, 'Understanding the landscape of privacy technologies.' Optional: Cypherpunk's manifesto
08/31	Personal Privacy Technology II		Daniel Le Métayer, 'Whom to trust? Using technology to enforce privacy' in <i>Enforcing Privacy</i>

		(excerpts)
		Rawat et al., Data Protection. Journal of Craptology. (!)
		<i>Challenge: Permissions</i>
09/02	Group Privacy Technology: Perspectives on Trust I	Friedman et al., 'Trust online.' Joanna Rutkowska, 'Security through Distrusting.'
09/07	Group Privacy Technology: Perspectives on Trust II	Ken Thompson, 'Reflections on Trusting Trust' Optional: Diverse double-compiling <i>Challenge: Cracking</i>
09/09	<i>Integrated session:</i> The Quantified Self	Optional: Doctorow, 'What If People Were Sensors, Not Things to be Sensed?' Optional: Hsu, 'The Strava Heat Map and the End of Secrets' <i>Preparation: Data about you</i>
09/14	Group Privacy Technology: Perspectives on Trust III	Gürses, S., 2010. PETs and their users: a critical review of the potentials and limitations of the privacy as confidentiality paradigm. (excerpts) Adam Shostack, Chapter 2: Strategies for threat modeling. In Threat Modeling: Designing for security. Optional: NSA Aqua Book and RFC 2196 , Sect. 2.1.1
09/16	Obfuscation	Helen Nissenbaum and Lowe. Obfuscation: A User's Guide. 'Why is obfuscation necessary?'
09/21	Obfuscation II	Geer, 'Identity as Privacy.' IEEE Security Privacy 11(1).

09/23	Threat modeling; More on Assignment 2	no readings
09/28	Hacktivism, and More on Obfuscation	Assange, <i>When Google met Wikileaks</i> (excerpts). Coleman. Hacker, Hoaxer Whistleblower, Spy. (excerpts). Menn, <i>Cult of the Dead Cow</i> (excerpts)
09/30	Analog hole and Video Analytics	Sicker, D.C., Ohm, P., Gunaji, S., 2006. The analog hole and the price of music: An empirical study. (excerpts)

Database Privacy

	Topic	Reading
10/05	Video Analytics	M. J. Wilber, V. Shmatikov, and S. Belongie, "Can we still avoid automatic face detection?"
10/07	<i>Integrated Session:</i> Video Surveillance	<i>Preparation: Mapping</i>
	Trade-offs I	Bambauer, 'Tragedy of the Data Commons' (excerpt) Lundberg, I., Narayanan, A., Levy, K., Salganik, M.J., 2018. Privacy, ethics, and data access: A case study of the Fragile Families Challenge. (excerpt) <i>Write-up: Enhanced Threat model</i>
10/12	Trade-offs II	Friedman, 'Interactional Stance' to 'Value Tensions,' in <i>Value-Sensitive</i>

		<i>Design. (excerpts)</i>
10/14	Deanonymizing	Sweeney, L., 2000. Uniqueness of simple demographics in the US population. Technical report, Carnegie Mellon University. Golle, 'Revisiting the uniqueness of simple demographics in the US population' Torra, Data Privacy 1.3.3: Terminology--Disclosure
10/19	Estimating privacy risk	Expert testimony, Sander v. UC Board of Regents (excerpts). <i>Challenge: Find Muggsy</i>
10/21	Differential privacy	Dwork, C., 2011. A firm foundation for private data analysis.
10/23	Networking Background	'TCP/IP overview,' in <i>TCP/IP Network Administration</i> <i>Optional: There and back again: a packet's tale (video)</i> <i>Optional: All About Networks</i> <i>Optional: TCP and UDP Ports Explained</i>

Anonymous Communication and Traffic Analysis

	Topic	Reading
10/26	Anonymity Background	Diaz, C., Danezis, G., Syverson, P., 2010. Anonymous Communication, in: Handbook of Financial Cryptography and Security. CRC Press. (excerpt)

	Data anonymization	Records, Computers, and the Rights of Citizens (excerpt) <u>Stephens-Davidowitz, Everybody lies (excerpt)</u>
10/28	Integrated Session: Database Reconstruction Attacks	<i>Preparation: Data and software</i>
11/02	Mix Networks	Chaum, D., 1981. Untraceable Electronic Mail, Return Addresses, and Digital Pseudonyms. <i>Challenge: Interact with an onion proxy programmatically; run an onion service</i>
11/04	Mix networks and Onion routing	Tor Overview
11/09	Mix Networks' future	Danezis, G., Goldberg, I., 2009. Sphinx: A Compact and Provably Secure Mix Format. <u>https://doi.org/10.1109/SP.2009.15</u> <u>Raymer, 'Overview of Quantum Information Science & Technology by Michael Raymer' (video)</u>
Privacy and Decentralization		
11/11	Self-Hosting in Education	<u>Gürses, 'Rectangles-R-Us' (video)</u>
11/16	Self-Hosting in Community Organizations	Scholz et al. (ed). <i>Ours to Hack and to Own</i> (excerpts)
11/18	Integrated Session: Privacy and EdTech	
11/23	Hosting a Social Network Instance I	<u>ActivityPub Specification</u> (If students are in town; o.w. may be cancelled)
11/25	No class (Thanksgiving)	

11/30	Hosting a Social Network Instance II	Costanza-Chock, <i>Design Justice</i> , Ch. 2 (excerpts) Friedman, 'Stakeholders,' in <i>Value Sensitive Design</i> ,. (excerpts)
12/02	Peer to Peer Technologies	B.A.T.M.A.N. advanced Grote, 'Briar'
12/07	Wrap-up	
12/09		Student presentations
12/ 13	<i>Our final exam date</i>	Submit final projects, celebrate!

COURSE MATERIALS

There is no textbook for this course; see the schedule for readings selected from a variety of sources.

SPECIAL MATERIALS

- This course is held online; it requires a laptop capable of videoconferencing, and of running Virtualbox with 2 -3 GiB extra storage space.

ASSIGNMENTS

- Assignments will be turned in via D2L. Be sure to turn in files exactly as described in the assignment: file names, formatting, etc. matters.
- There will be four challenges on the course server; your top three count. (10% each)
- There are three preparations for integrated sessions; your top two count. (10% each)
- There will be two write-ups. (10% each)
- There will be one final project on an approved topic of your choosing, in lieu of a final exam. The final project may be done in a group. (30%)

FINAL PROJECT

There is a final project in this class, but no final exam. The final project is due the day and time of the final exam, which is found at

<http://www.registrar.arizona.edu/schedules/finals.htm>.

GRADING SCALE AND POLICIES

- Grading policy: See assignments, where the scale is represented next to the assignment description.
- (*) Requests for incomplete (I) or withdrawal (W) must be made in accordance with University policies, which are available at <http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete> and <http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal> respectively.
- (*) Dispute of Grade Policy: Provide the acceptable time period for disputing a grade on a paper, project, or exam.

HONORS CREDIT (*)

Students wishing to contract this course for Honors Credit should email me to set up an appointment to discuss the terms of the contract. Information on Honors Contracts can be found at <https://www.honors.arizona.edu/honors-contracts>. If we have enough interest (and I know about it early enough), we may form an honors section.

THREATENING BEHAVIOR POLICY (*)

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See <http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>.

ACCESSIBILITY AND ACCOMMODATIONS (*)

Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact the Disability Resource Center (520-621-3268) to establish reasonable accommodations. For additional information on the Disability Resource Center and reasonable accommodations, please visit <http://drc.arizona.edu>.

If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.

Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

ACADEMIC INTEGRITY AND STUDENT CODE OF CONDUCT (*)

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of

independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: <http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>.

UNIVERSITY NONDISCRIMINATION AND ANTI-HARASSMENT POLICY (*)

The University is committed to creating and maintaining an environment free of discrimination; see <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

ADDITIONAL RESOURCES FOR STUDENTS (*)

- Office of Diversity: <http://diversity.arizona.edu/>
- Counseling and psychological Services: <http://www.health.arizona.edu/counseling-and-psych-services>
- Oasis: <http://oasis.health.arizona.edu/>

CONFIDENTIALITY OF STUDENT RECORDS (*)

<http://www.registrar.arizona.edu/personal-information/family-educational-rights-and-privacy-act-1974-ferpa?topic=ferpa>

UNIVERSITY PRONOUN NAME POLICY (*)

Instructors and students will use names and pronouns as requested, and instructors will update their rosters to accommodate students who modify their names and/or pronouns after course registration. Instructors will make specific reference to the name and pronoun usage statement in the syllabus on the first day of class and model correct name and pronoun usage in the classroom.

SUBJECT TO CHANGE STATEMENT (*)

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.