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Mobile Technologies: Participation and Surveillance

Katie Shilton
University of California - Los Angeles

Mobile Technologies: Participation and Surveillance
Spring Quarter 2010
Tuesdays, 1:00 – 3:50, GSEIS Room 245

Katie Shilton
Department of Information Studies
kshilton@ucla.edu
Office hours: Tuesdays, 9am – 11 am, GSEIS upstairs cubicle, or by appointment
Course website: http://ccle.ucla.edu/course/view/10S-INFSTD98T-1

Introduction
Mobile phones could become the largest surveillance system on the planet. These ubiquitous devices can sense and record data such as images, sound and location. They can automatically upload this data via wireless connections into systems for aggregation and analysis. But unlike traditional surveillance devices, phone sensors can be controlled by billions of individuals around the world. Are emerging mobile technologies platforms for citizen participation in research and discovery? Or new tools for mass surveillance?

Location-based technologies and mobile phone applications like carbon footprint calculator *Ecorio* and Google's *Latitude* are attracting attention and raising new questions for engineers, policy makers, and users. These systems collect and combine data in new ways, and their effects cross political boundaries. Who will build and control processes such as data storage, aggregation, sharing, and retention? What policies are required to control this data, and who sets them? And to what purposes will these systems be deployed?

Humanists, social scientists, and technologists all have tools and perspectives to investigate these questions and contribute to a discussion of social issues in mobile sensing. This course brings together students from across campus to use some of those disciplinary tools and explore ethics and social challenges engendered by new technologies. Readings, discussion, design exercises and assignments will provide methods, tools, and contexts for unpacking the social issues embedded in emerging technologies. We will concentrate on the features of mobile technologies and how our worldview – specific cultural lenses, research practices, political orientations, economic pressures, popular narratives and fiction – influences how these features are imagined and built.

Objectives
By the end of the course, students will:
1. Comprehend cross-disciplinary debates about emerging technologies
2. Apply concepts and critiques from technology studies to emerging mobile technologies
3. Evaluate both opportunities and risks for emerging technologies
4. Analyze new technologies from policy and ethical perspectives
5. Propose policy and technical solutions to social challenges posed by new technologies

Requirements
1. Assigned reading and class participation: 10%
2. Introductory paper: 10%

3. Final paper abstract and bibliography (due Week 4): 10%
3. Debate paper (due Week 7): 30%
4. Final paper (due Week 10): 40%

Assignments

1. Introductory Paper (2-3 pages double-spaced)

Check/check-minus grading

Choose a location-based technology from this syllabus or that we have discussed in class. Investigate the technology's website. Do you already use this technology? If not, would you? Why? What is it useful for? What potential problems do you see? Do you think there are people (children, the elderly, social groups) who would, or should, use this technology? Are there groups who should not use this technology? **Due Week 2.**

2. Debate Paper (8-10 pages double-spaced, written with a partner)

Letter grade – 30% of final grade

With a partner, choose a social issue related to the introduction and use of a location-based or personal sensing technology. Each partner should choose a "side" in the debate – you may advocate for either the social potential of the technology, or the social problems the technology will engender. Compose an 8-10 page paper in an argument-and-response style, as if you were having a debate on paper. One of you should begin the paper by laying out your argument for a technology's potential or problems. The other should then respond to that argument from the opposite viewpoint. You should build the paper by going back-and-forth multiple times to revise and polish your arguments. The format should be as follows:

A. Partner #1: Initial argument (e.g. Location-based advertising is good for consumers and the marketplace)
B. Partner #2: Response and counter-argument (location-based advertising hurts consumers and/or the marketplace)
C. Partner #1: Rejoinder from the initial point of view
D. Partner #2: Closing argument from the opposing point of view

To write the paper, one partner should start a draft of their initial argument and then pass it to the other. Passing the paper back-and-forth multiple times will strengthen both of your arguments. All students should be prepared to explain and discuss their work on this paper in class. The Debate Paper will be due in **Week 7.**

3. Final Paper (10-12 pages double-spaced)

Letter grade – 40% of final grade

The final paper should be a critical analysis of a location-based or personal sensing technology that takes into account both the potential and problems of an emerging technology and proposes technical or policy solutions to make a technology workable and socially acceptable. I strongly encourage you to re-evaluate the technology you chose for the Introductory Paper and include reflection and analysis of if, and why, your evaluation has changed. (You may choose a new topic if you have a strong reason for doing so – please see me first.) An abstract and a sample bibliography for your final paper will be **due in Week 4**. You will therefore need to begin thinking about your topic and sources to support your argument right away.
The final paper should be 10-12 (double-spaced) pages, and will be **due in Week 10**.

Required Texts:
Ess, C. (2009). *Digital media ethics*. Cambridge, UK and Malden, MA: Polity Press.
Note: The bookstore was unable to procure the Ess book. It is available on Amazon.com and other online booksellers; please order it before class begins.

Sismondo, S. (2004). *An Introduction to Science and Technology Studies*. Malden, MA: Blackwell.

We will read chapters from Ess and Sismondo throughout the class. These will introduce you to an interdisciplinary approach to thinking through the social problems of technology, and to give you background in methods you might use to attack those problems. Think of Sismondo as providing a variety of ways to look at technology, and background and tools with which to think through new problems. Ess gives a nice introduction to thinking about social problems and ethics from different cultural and theoretical frameworks. All other readings will be provided on the course website.

Schedule and Preparing for Class

Week 1: Introducing an STS perspective on Mobile Sensing and Location-Based Technologies
Week 2: Sensing Everywhere—Consequences of Capture
Week 3: Mash-ups and Models; Networks and Flows
Week 4. Making Sense of the Data
Week 5. Persistent Memory and the Data Commons
Week 6. What Must We Do? Law and Personal Sensing
Week 7: Ethics in Design –Investigating Hard Decisions
Week 8. But What Should We Do? Incorporating the Social in Design
Week 9. So What Can We Do? Imagining Technological and Policy Solutions
Week 10. Wrap-up and Discussion of Papers

Please read the required readings before the date for which they are listed. In addition, browse through the sensing and location-based applications listed each week, to get a feel for how these technologies work and what they can do. (These technologies can also provide a jumping off point for your Introductory and Final Papers, although you may choose a technology not on this list if you talk to me first.)

As you read each required article, ***prepare a 2-3 sentence summary*** of the article. Imagine you had to put together a status update or a tweet that would review the article. (Alternately, what two sentences would you tell your parents if they asked about what you were reading?) Sometimes, it's useful to try to describe ideas visually, so instead of a short summary, you may also draw a picture or diagram that relays the main idea(s) of the article. You should prepare this short summary for each article you read; I will call on people each week in class to share their summaries or illustrations. This will count towards your participation grade.

Each student will need to volunteer to read one of the articles labeled "For Further Investigation" each week. Everyone will be required to do one article over the course of the quarter. You must

summarize your article for the class and prepare discussion questions. Others may read the articles if they are relevant to their papers or of particular interest. Assume only a few others will have read the article which you will present.

Topics and Readings

Week 1: An STS perspective on Mobile Sensing and Location-Based Technologies
What is mobile sensing? What are location-based technologies? Who uses them, and for what? What are the components and how do they work? Who builds and controls infrastructures for sensing? And what is Science and Technology Studies (STS), and what does it have to say about mobile sensing? This week's readings will provide both technical and lay descriptions of location-based technologies, and introduce us to some of the concepts and social problems that we'll explore throughout the course.

Applications:
Dartmouth MetroSense projects http://metrosense.cs.dartmouth.edu/metro-projects.html; Ushahidi, http://www.ushahidi.com/; Ecorio, http://www.ecorio.org/; CENS Urban Sensing, http://urban.cens.ucla.edu/; Real Time Rome, http://senseable.mit.edu/realtimerome/

Readings:
Sismondo, chapters 1 and 3. *These are short chapters designed to give you an idea of what Science & Technology Studies is, where it comes from, and what it might have to say about location technologies and surveillance.*

Ess, Chapter 1. *This is a short introduction to some of the ethical problems that new media create. We will be discussing these ethical problems throughout the quarter.*

Calabrese, F., Kloeckl, K., & Ratti, C. (2007). Wikicity: Real-Time Location-Sensitive Tools for the City. Proceedings of CUPUM 2007. http://senseable.mit.edu/wikicity/pdfs/wikicity-at-Digital%20Cities-5.pdf *This is a technical description (from the CS field) of one application of mobile sensing*

Donner, J., Verclas, K., & Toyama, K. (2008). Reflections on MobileActive 2008 and the M4D Landscape. MobileActive.org and Microsoft Research India. http://mobileactive.org/files/DVT_M4D_choices_final.pdf. *This is a social description, from the development field, of what mobile technologies might do for the world.*

Honan, M. (2009, January 19). I am here: one man's experiment with the location-aware lifestyle. Wired Magazine, 17(2). http://www.wired.com/gadgets/wireless/magazine/17-02/lp_guineapig. *This is a popular description of what location technologies might mean for social interactions and day-to-day life.*

Week 2: Sensing Everywhere—Consequences of Capture
****Introductory paper due**
What does it mean to capture data about ourselves all of the time? What can we discover from data captured from ubiquitous devices? What are new applications for this sort of data capture? What problems might this data raise? What does it mean for individual and group identity, power and equity, and privacy? This week's readings suggest several ways to talk about privacy and other problems in a world of increasing data capture.

Applications:
Yahoo's FireEagle, http://fireeagle.yahoo.net/, Google Latitude, http://www.google.com/latitude/intro.html, RescueTime http://www.rescuetime.com/, Bedpost http://www.bedposted.com/.

Readings:
Sismondo, Chapters 6, 9 and 13.

Ess, Chapter 2.

Agre, P. E. (1994). Surveillance and capture: two models of privacy. *The Information Society, 10*(2), 101-127.

Bell, G., & Gemmell, J. (2007). A digital life. Scientific American, 58-65.

Capurro, R. (2006). Intercultural Information Ethics. In *Localizing the Internet. Ethical Issues in Intercultural Perspective*. ICIE Series Vol. 4: Fink.

Foucault, M. (2002). The Eye of Power: A Conversation wtih Jean-Pierre Barou and Michelle Perrot. In *CTRL [SPACE]: Rhetorics of Surveillance from Bentham to Big Brother* (pp. 94-101). Cambridge, MA and London: The MIT Press.

For Further Investigation:

Andrejevic, M. (2007). Chapter 8, iMonitoring: Keeping Track of One Another. *iSpy: surveillance and power in the interactive era.* Lawrence, KS: University Press of Kansas.

Mann, S., Fung, J., & Lo, R. (2006). Cyberglogging with camera phones: Steps toward equiveillance. In *ACM Multimedia 2006*. Santa Barbara, CA: ACM.

Marx, G. T. (1998). Ethics for the new surveillance. The Information Society, 14, 171-185.

The Quantified Self Blog: http://www.kk.org/quantifiedself/

Week 3: Mash-ups and Models; Networks and Flows
What happens when researchers, users, or others combine personal sensing and location data with existing data and models in 'the cloud'? What can we learn? What mash-ups raise new challenges? This week's readings discuss the ways that data is combined to create new knowledge (for researchers, and for marketers), and new awareness of our everyday activities.

Applications:
Outside.in http://blog.outside.in/iphoneapp/; the Personal Environmental Impact Report (PEIR) http://peir.cens.ucla.edu/.

Readings:
Sismondo, Chapter 8.

Curry, M. R., Phillips, D. J., & Regan, P. M. (2004). Emergency response systems and the creeping legibility of people and places. The Information Society, 20, 357-369.

Khan, V., & Markopoulos, P. (2009). Busy families' awareness needs. International Journal of Human-Computer Studies, 67(2), 139-153.

Nissenbaum, H. (2009). Chapter 7. *Privacy in Context: Technology, Policy, and the Integrity of Social Life.* Stanford, CA: Stanford Law Books.

For Further Investigation:
Bell, G. (2006). No More SMS from Jesus: Ubicomp, Religion and Techno-spiritual Practices. In P. Dourish & A. Friday (Eds.), UbiComp 2006: Ubiquitous Computing (Vol. 4206, pp. 141-158).

Chew, M., Balfanz, D., & Laurie, B. (2008). (Under)mining Privacy in Social Networks. In W2SP 2008: Web 2.0 Security and Privacy 2008.

Perusco, L., & Michael, K. (2007). Control, trust, privacy, and security: evaluating location-based services. *Technology and Society Magazine, IEEE*, *26*(1), 4-16. doi: 10.1109/MTAS.2007.335564.

DARPA's Information Awareness Office: http://infowar.net/tia/www.darpa.mil/iao/

Week 4. Making Sense of the Data
****Final paper abstract and sample bibliography due**
Mobile sensing produces more data than a human can easily parse. Sensors might collect hours of latitude and longitude readings. These data streams must be interpreted using calculations, models, maps, and other techniques. This week's readings discuss tools and techniques for making these interpretations and drawing sense from copious data. They also explore whether data interpreted through models ever be *objective*, or whether making sense of data depends upon points of view, standpoints, and social or political contexts.

Applications:
Your Street http://www.yourstreet.com/, Datascape http://e.fluxt.com/datascape/, MIT Reality Mining visualizations http://reality.media.mit.edu/viz.php, Bricolage Labs http://www.bricolagelabs.com/

Readings:
Sismondo, Chapter 16.

Borgman, C. L. (2007). Data: Input and Output of Scholarship. *Scholarship in the digital age: information, infrastructure, and the internet*. Cambridge, MA and London: The MIT Press.

Corburn, J. (2003). Bringing local knowledge into environmental decision making: Improving urban planning for communities at risk. *Journal of Planning Education and Research*, *22*, 120-133.

David, S. (2007). Toward participatory expertise. In Structures of participation in digital culture (pp. 176-196). New York: Social Science Research Council.

Eagle, N. (2008). Behavioral Inference across Cultures: Using Telephones as a Cultural Lens. *Intelligent Systems, IEEE*, *23*(4), 62-64.

Vaidya, J., & Atluri, V. (2008). Privacy, profiling, targeted marketing, and data mining. In *Digital Privacy: Theory, Technologies, and Practices*. New York and London: Auerbach Publications.

For Further Investigation:

Elwood, S. (2006). Critical issues in participatory GIS: Deconstructions, reconstructions, and new research directions. *Transactions in GIS, 10*(5), 693-708.

The Critical Spatial Practice blog: http://criticalspatialpractice.blogspot.com/

Week 5. Memory and Forgetting

What are the consequences of creating a data commons full of personal sensing data? What does it mean to create an archive of personal data? This week's readings discuss the benefits of this new conception of an archive, as well as the problems the totalizing nature of this memory might raise.

Applications:

Microsoft's MyLifeBits, http://research.microsoft.com/en-us/projects/mylifebits/default.aspx

Readings:

Bannon, L. (2006). Forgetting as a feature, not a bug: the duality of memory and implications for ubiquitous computing. CoDesign, 2(1), 3-15.

Blanchette, J., & Johnson, D. (2002). Data retention and the panoptic society: the social benefits of forgetfulness. *The Information Society, 18*(33-45).

Borges, Jorges Luis. Funes the Memorious.

Ketelaar, E. (2005). Recordkeeping and societal power. In Archives: Recordkeeping in Society (pp. 277-298). Wagga Wagga, New South Wales, Australia: Centre for Information Studies, Charles Stuart University.

Week 6. Law and Personal Sensing

****Outline of final paper due – bring 2 copies to class****

What laws currently apply to personal sensing data? Where is new legislation needed? This week's readings from legal and policy forums discuss both the present state of U.S. data legislation, and new directions that lawyers and policymakers might take.

Readings:

Sismondo, chapter 15.

Waldo, J., Lin, H. S., & Millett, L. I. (2007). Chapter 4: The Legal Landscape in the United States. *Engaging privacy and information technology in a digital age.* Washington, D.C.: The National Academies Press.

Weitzner, D. J., Abelson, H., Berners-Lee, T., Feigenbaum, J., Hendler, J., & Sussman, G. J. (2008). Information accountability. *Communications of the ACM, 51*(6), 82-87.

Week 7: Ethics in Design –Investigating Hard Decisions

****Debate paper due**

Research into decision-making in design is starting to suggest tools and techniques for influencing the design process. This week's readings and discussion will take the topics we have covered so far and ask what designers and non-designers alike might do to build socially responsible sensing and location-based technologies. How do designers make decisions about tradeoffs between accuracy and privacy, ease of use and informed consent, or speedy design and involving users? How can non-designers be influential in this process?

Readings:
Sismondo, Chapter 10.

Ess, Chapter 6.

Bellotti, V. (1998). Design for privacy in multimedia computing and communications environments. In Technology and privacy: The new landscape (pp. 63-98). Cambridge, MA and London: The MIT Press.

Friedman, B., Kahn, P. H., & Borning, A. (2006). Value sensitive design and information systems. In D. Galletta & P. Zhang (Eds.), Human-Computer Interaction and Management Information Systems: Applications (Vol. 6). New York: M.E. Sharpe.

Nissenbaum, H. (2009). Chapter 8. *Privacy in Context: Technology, Policy, and the Integrity of Social Life.* Stanford, CA: Stanford Law Books.

For Further Investigation:

Kensing, F., & Blomberg, J. (1998). Participatory Design: Issues and Concerns. Computer Supported Cooperative Work (CSCW), 7(3), 167-185.

Suchman, L. A. (2002). Practice-Based Design of Information Systems: Notes from the Hyperdeveloped World. The Information Society, 18(2), 139-144.

Week 8. Incorporating the Social in Design

No readings this week; instead, use the time to work on your final papers. In class, we'll build on last week's readings and try some design activities to build values such as contextual privacy into design.

Week 9. Imagining Technological and Policy Solutions
What are the next steps for the design and implementation of responsible sensing technologies? How do we create technology or laws that respond to social problems with unique solutions? What are the roles of technical solutions, and what will require policy interventions? This week's readings will suggest both scholarly and fictional imaginings of solutions to many of the data dilemmas we have discussed thus far.

Applications:
P3P http://www.w3.org/P3P/, XACML http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=xacml, EPAL http://en.wikipedia.org/wiki/Epal

Readings:
Byrne, E., & Alexander, P. M. (2006). Questions of ethics: Participatory information systems research in community settings. In *SAICSIT* (pp. 117-126).

Hayes, G. R., Poole, E. S., Iachello, G., Patel, S. N., Grimes, A., Abowd, G. D., & Truong, K. N. (2007). Physical, social and experiential knowledge in pervasive computing environments. *Pervasive Computing, 6*(4), 56-63.

Shilton, K. (2009). Four billion little brothers?: privacy, mobile phones, and ubiquitous data collection. Commun. ACM, 52(11), 48-53.

Week 10. Wrap-up and Discussion of Papers

** **Final paper due**

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