Urban Datascapes

Columbia University GSAPP PLANA6106
200 Buell Hall | Tuesdays 3-5PM

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Syllabus: Spring 2019

As the opaque and esoteric worlds of code operate to directly shape the practices and possibilities of everyday life in ever-extending ways, so the analytical challenge is thus to excavate the worlds of code as critical political, social and geographical sites requiring urgent understanding, regulation and intervention.[1]

The drawings did not illustrate an implementable project; they were an implemented project. As such, they carry a set of ethical questions regarding their effects, use, and location within the city—including, for example, the completeness and clarity of the information shared, the impacts of their dissemination, their influence on decision-making, and their relationship to present and future participatory practices.[2]

Course Description

The Short Version

This seminar pairs theories of technological "smartness" in urban environments with concepts and practices in critical cartography to investigate, both, the infrastructures ordering data collection and creation and the sociospatial systems of representation they engender. From sensors to social media, surveillance to resilience, decision making to community building: What are the means by which our data infrastructures are designed and planned? How do these systems influence urban research and visualization? And what implications do they carry for urban practice? Following close reading, discussion, and short response papers, the final project-based deliverable asks students to explore these questions through techniques of mapping and data analysis (qualitative and quantitative) comparing alternatives, narratives, and outcomes.

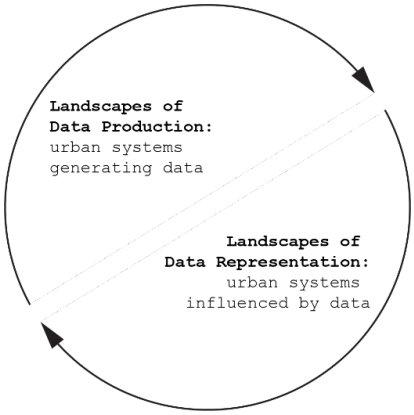
Overview

Right now, two deeply connected, but often separated, processes are developing and accelerating with profound impacts on the design and planning of cities and regions. On one hand: ubiquitous computing, location-based services, mobile social media, networks of sensors, and the ecology of connected devices termed the "Internet of things" continue to collect, produce, harvest, or otherwise generate digital information. On the other: the deployment, exploitation, and use of digital information has never been greater in the determination of urban futures—from decisions made by individuals and households to activist and community-based visualization campaigns to evidence-based policy-making and the algorithmic automation of urban management. Consider: the 2020 US Decennial Census will be the first to attempt an enumeration online.

[1] Graham, S.D.N. (2005) Software-sorted geographies. *Progress in Human Geography, 29* (5), 563.

[2] Meisterlin, L. (2018). Not Yet #AfterRikers: Looking for #JusticeInDesign. *The Avery Review*, (32).

With this in mind, underpinning this seminar is a two-fold working definition of “datascape” based on an integrated investigation of systems and infrastructures that are *both* concretely located within urban environments *and* dependent upon digital information. This course is not a seminar on one or the other of these processes. It is not a discussion of “Planning the Smart City” nor of “DataViz for Urban Planning.” We will not limit our conversations to the analytics that qualify as smartness or to the analytics applied to emerging urban datasets. Rather, we will examine a series of case study urban topics that are subject to reconceptualization and possibly radical transformation by both.



In effect, for each topic—mobility and transit, environment and emergency, policing and security, housing and home—we will interrogate its changes within a feedback loop. For each topic, we will consider the landscape constructed from located, physical infrastructures of data production and those, in turn, produced or influenced by its representation.

Method of Instruction

Given the course topic(s) and the very active and current debates on the case studies, their technologies, and their implications, the class is structured as a seminar proper, primarily focused on an actively discursive method of instruction. Readings, thus, serve to lay out some of the historical and theoretical underpinnings for the topics and to offer comparative examples. Where readings might appear cumbersome, I offer notes describing the content of the reading list. Students should use those notes to determine how best to approach the list based on previous knowledge per topic.

Through loosely structured but rigorous discussion, we will move through the case studies in search of commonalities, differences, and patterns by which urban spaces may (or may not) be undergoing processes of structural change as a result of digital process-based shifts in urban infrastructure, research, and politics. Further, we will ask (and attempt to answer) what those changes imply or require *vis-à-vis* the role of urban planners, designers, advocates, and policy makers.

Toward this end, the seminar’s structure is designed to elicit (1) thoughtful and in-depth critical analysis on each case study presented as well as (2) comparative analysis across topics and scales through the course of the semester.

Student Learning Objectives

Among others, the course objectives include the ability to translate (bidirectionally) between scholarly works of theory or empirical research and implemented projects or on-the-ground acts of intervention whether they be products, proposals, platforms, or policies.

More specifically, upon successful completion of the course, students should be able to

- Understand and critically interpret the central social and economic themes currently present in rising debates on data-driven or data-dependent technologies and their relationship to urban development, as well as several historical or precedent examples contributing to the development of the topics studied;
- Understand the development of urbanism as a discipline, with particular focus on its codevelopment adjacent to related disciplines, as well as the historical relationship between the development and planning of cities, societies, technologies, information, and political economies;
- Demonstrate a facility with transdisciplinary analysis and inquiry, incorporating sources (both primary and secondary) and methods (quantitative, qualitative, and spatial) from across urban disciplines in the study of cities and their planning processes;
- Develop a critical approach to the analysis of urban data, one that situates data sources and data sets within the context of their production and includes (at a minimum) thoughtful and careful primary-source analysis for digital information; and

- Develop the basic elements necessary for exploratory, experimental, and thesis-driven data representation projects.

Standard Information

The class meets once weekly on Tuesdays from 3 to 5PM, save for exceptions described in the academic calendar and reflected in the Course Schedule below. Barring any technical difficulties or extraordinary circumstances, class will begin promptly.

Device Policy

For the respect of others, the classroom policy on devices and computers is as follows.

- Students may use the computers, tablets, and other digital devices to access readings and notes.
- Students may use those devices for other reasons very minimally, so long as they do not become a distraction or an in-class habit.
- Non-class-related, on-screen content is not allowed. This means that, by way of example, the absolute only way to make Twitter usage okay by this policy is to be tweeting about class (with appropriate hashtags and mentions, of course). For your reference: #UrbanDatascapes

Evaluation & Grading

Seminar Participation (15% of final grade)

Students are expected to keep up with the syllabus schedule, completing readings prior to class and arriving prepared for discussion. While the syllabus divides readings into specific topics and case studies, these are organized with a cumulative logic. Thus, concepts and ideas discussed in the early weeks will reappear, and certain topics cannot be meaningfully discussed without prior groundwork laid in others. As a result, again, students are expected to keep pace with the syllabus reading schedule.

To be clear, participation in discussion is a basic requirement of the course comprising 15% of the final grade. Given the discussion-based method of instruction (above) and the structure of the seminar, you will only get out of this class what you put into it. (*I.e.,* there is no learning through osmosis here.) So, again, participation is a minimum requirement. Full participation points will be granted for consistent, active, thoughtful, thought-provoking, and rigorous attention to the discussion at hand.

Given the material covered in the course, it is only appropriate to include digital platforms—as a supplement, not a substitute—when considering discussion participation. The class's Canvas discussion board (see below) will be used for augmenting in-class discussion. For the social-media-platform, inclined, use the hashtag #UrbanDatascapes.

Seminar Presentation & Bibliography (35% of the final grade)

Each student (working in groups) will present one of the topics covered in the seminar and lead a discussion of the topic. Students will be given a complete assignment description outlining the requirements and expectations. In short, there are three components:

- An annotated bibliography of supplementary sources on the topic and/or comparative cases presented in class;
- A slide presentation delivered in class and online on the day of the topic's discussion; and
- Leading discussion of the case study including raising critical questions and offering these and/or hypotheses for debate.

Final Project or Paper (50% of final grade, total)

Students will conceive, develop, and execute a final project or research paper. Students completing final projects are strongly encouraged to work in groups. Briefly, projects and papers must critically explore and/or examine a specific urban data set through its means of production and its implications or potentials through representation. A complete assignment description will be distributed, outlining the requirements and expectations. The final deliverable will be presented during the last class session, and an interim deliverable (a proposed topic description) will be required before completion of the project.

Attendance

With a mind toward the importance discussion carries in the course structure, students are expected to attend every class meeting. Attendance records will be maintained throughout the semester (via sign-in sheets). Students with excessive absences (greater than 1) without appropriate reason, will see a reduction in their final grades.

Students who will miss class due to religious holidays or other appropriate reason should email LM and the class TA in the first week of classes with the dates (and reasons) of their foreseen absences and are encouraged to make arrangements with their peers for notes.

Submission

Each assignment will outline the specific requirements for it submission format, deadline, and deliverable expectations.

Save for extenuating circumstances for which extensions will be given only with prior approval and compelling reasons, absolutely no late assignments will be accepted without a late penalty. The late penalty is a reduction of 50% of the total points possible within the first 24 hours after the deadline and an additional 25% of the total possible points up to 48 hours after the deadline.

Back-up Policy

Students are responsible for consistently backing up their work throughout the semester. Extensions will not be granted for technical losses of work. (Given the availability of cloud storage and the need to regularly store one's work off GSAPP machines, this should never be a problem in the course.)

Grading

Students are often concerned with where the lines are drawn in determining final grades. To avoid confusion or panic, here's how it will work: LM will use the percentages listed above to assign grades at the end of the semester. High-quality projects and deliverables are expected for receiving a Pass (and necessary but insufficient for receiving a High Pass). The High Pass is reserved for truly outstanding, consistent, and dedicated work in *all* aspects of the course, including seminar preparation and discussion.

Expectation of Academic Honesty

As always and as with every other course, this class is conducted in accordance with University policy on matters of academic honesty and integrity and with attention to the University's Honor Code. Note that instances of plagiarism will not be tolerated—whether in written text, in research design, or in data acquisition and creation—and will result in an automatic failure in the course. We build on the work of others; give credit where credit is due.

Additionally, this course contains a few considerations which should be stated. At several points in the semester, students will be encouraged to look to their peers for collaborative problem solving and troubleshooting especially within the lab setting. Except where otherwise stated in specific assignments, collaboration is welcomed but individual assignments must be conceived and completed individually.

Lastly, an explicit and related reminder: given the nature of the topics explored in the course and the discipline's requirement toward action and intervention (*i.e.,* students are expected to develop and hold value judgments on the material discussed), we should be consciously aware of the principle of academic freedom. I suspect students have already rendered several opinions about the value and use of many of the topical technologies. I also suspect several of those opinions will be *respectfully* challenged within the course.

Students with Disabilities

Students with disabilities taking this course who may need disability-related accommodations are encouraged to make an appointment with LM and their lab instructor as soon as possible. Disabled students who need accommodations should be registered in advance with the Office of Disability Services.

Resources & Materials

Readings

There are no required book purchases associated with this course. That said, the readings pull heavily from a few excellent anthologies, which are certainly recommended purchases.

Readings that are not available electronically as open sources or through the Libraries will be distributed digitally via Canvas.

Canvas

This class will rely heavily on the Canvas platform for distributing readings, collecting and sharing additional resources, submitting assignment deliverables, and discussion. (Students are encouraged to use the discussion board features to augment in-class discussion.)

Canvas will also be used to distribute class-wide emails. Please be sure to actively monitor the email address associated with your Canvas login.

DSSC

The Digital Service Science Center is located on the lower level of Lehman Library (at SIPA) and is a great resource for geospatial data and technical questions. DSSC collects spatial data and may have what you need for your final project. Further, if they don't have the data you're looking for, the data librarians can usually help you find it. DSSC also has technical consultants available for questions regarding data as well as those related to performing certain GIS operations. Their facility is equipped with computer stations (with extremely nice monitors). Check their hours of operation before visiting on the Columbia Libraries website. http://library.columbia.edu/content/libraryweb/indiv/dssc.html

Office Hours

LM holds weekly office hours in 303 Buell Hall on Wednesdays from 12:00PM to 1:00PM. Individual meetings can be arranged for times outside office hours by appointment.

Course Schedule

Notes on the Reading Lists

Note that none of the readings are labeled “required” or “optional.” Students are responsible for a full understanding of each topic as described from several perspectives and should consult the reading list as needed in preparation for these discussions, based on the planned arc of the discussion and their prior knowledge of the readings and/or case study. To this end, discussion and reading notes are provided throughout the schedule to help students approach the readings and prepare for class.

Week 1
22 Jan

INTRODUCTIONS

Housekeeping: Course Overview, Review of the Syllabus, Expectations, and Paperwork.
Brief discussion of the course’s purpose and intentions, including Why We’re Here and What’s At Stake.

Weeks 2-3

PREMISES

The first couple weeks of the semester are dedicated to collectively establishing the terms of our discussion for the remainder of the seminar. We will examine technologies and infrastructures of data production and data representation within urban environments as well as their relation to urban planning, policy, and design.

Note that the lists for these weeks include more than we will be able to discuss during our first few seminar sessions. (Again, refer to the discussion notes to help you prepare.) As “premises,” these lists contain several conceptual, theoretical, and historical pieces upon which you can rely and to which you should refer throughout the semester.

29 Jan

Urban Landscapes of Data Production

Discussion Notes: Students should familiarize themselves with the topics and terms highlighted in the reading lists, including “Internet of Things,” “Smart City,” “Big Data,” and “Volunteered Information.” Our discussion this week aims to establish working definitions of terms that are currently either without consensus or defined by corporate marketing and trademarks. In addition to definitional clarity, students should be prepared to discuss relative costs, benefits, aims, and intentions of these concepts and their related products and platforms.

Reading Notes: We must necessarily begin with confronting and questioning the “smart city.” Greenfield (2013), Hollands (2008), and Verrest and Pfeffer (2018) do just that. Further, Caragliu and Del Bo (2018) provide a recent example of the primary way in which “smart city” and “innovation” policies are evaluated. Kitchen (2014, 2018), Straube (2018), and Thrift and French (2002) collectively discuss the relationship between data, data infrastructures, and the processes of urbanism. Regarding the specific systems, technologies, platforms, and infrastructures involved: Greenfield (2006) outlines early concerns and possibilities raised by ubiquitous computing; Dourish (2016) raises relevant questions on the Internet of Things (IoT); Felgenhauer (2018) discusses issues revolving around the “collection” of “volunteered” data; and Singleton (2016) examines demographic information as the product of a geographic infrastructure of data production. Lastly, Burdett and Rode (2012) is provided as a baseline for our discussions, positioning electricity as an infrastructural prerequisite, precedent, and foundation for the semester.

Burdett, R., & Rode, P. (Eds.). (2012). *Urban Age Electric City*. London: London School of Economics.

Caragliu, A., & Del Bo, C. F. (2018). Smart innovative cities: The impact of Smart City policies on urban innovation. *Technological Forecasting and Social Change*. https://doi.org/10.1016/j.techfore.2018.07.022

Dourish, P. (2016) The Internet of urban things. In Kitchin, R., & Perng, S.-Y. (Eds.). *Code and the City*. (pp. 27-48) London; New York: Routledge, Taylor & Francis Group.

Graham, S. D. N. (2005). Software-sorted geographies. *Progress in Human Geography, 29*(5), 562–580.

Greenfield, A. (2006). Everyware: The Dawning Age of Ubiquitous Computing. Berkeley, California: New Riders.

-----. (2013). Against the Smart City. New York: Do Projects.

Felgenhauer, T. (2018). Diversity and Transparency in (Volunteered) Geoinformation Practices. *GI_Forum*, 1, 97–102.

Hollands, R. G. (2008). Will the real smart city please stand up?: Intelligent, progressive or entrepreneurial? *City, 12*(3), 303–320.

Kitchin, R. (2014). The real-time city? Big data and smart urbanism. *GeoJournal, 79*(1), 1–14.

-----. (2018) Data-driven urbanism. In Kitchin, R., *et al.* (Eds.), *Data and the City* (pp. 44-56). London ; New York: Routledge.

Singleton, A. (2016) Cities and context: The codification of small areas through geodemographic classification. In Kitchin, R., & Perng, S.-Y. (Eds.). *Code and the City*. (pp. 215-235) London; New York: Routledge, Taylor & Francis Group.

Straube, T. (2018) Situating data infrastructures. In Kitchin, R., *et al.* (Eds.), *Data and the City* (pp. 156-170). London; New York: Routledge.

Thrift, N., & French, S. (2002). The automatic production of space. *Transactions of the Institute of British Geographers, 27*(3), 309–335.

Verrest, H., & Pfeffer, K. (2018). Elaborating the urbanism in smart urbanism: distilling relevant dimensions for a comprehensive analysis of Smart City approaches. *Information, Communication & Society*, 1–15.

5 Feb

Urban Landscapes of Data Representation

The Seminar Presentation assignment description will be distributed via Canvas prior to class. Presentation assignments will be determined in class. (Arrive to class with at least three preferred presentation topics in mind.)

Discussion Notes: There are two primary threads to follow in preparing for this week's discussion. The first comprises the modes and techniques of analysis and visualization that define the data-drive ways that urbanism is described, characterized, and otherwise represented. The second is no less representational, although decidedly less visual—the data-driven infrastructures and practices of policy making, governance, and urban management. In preparing for this session, students should be familiar with the principles of power, formed and exercised through data analysis and representation (particularly within critical cartography and critical GIS). Additionally, students should examine implemented examples of visualization and analysis projects (from the readings and from their prior experience), and prepare to discuss both the effects or impacts of the project and the means by which those are accomplished.

Reading Notes: This week's readings are assembled to establish a foundation for our discussions through the semester. Again, this list is longer than we can reasonably cover in one week. Students should approach the readings with the Discussion Notes in mind and return to this list in the weeks to come for reference. Crampton and Krygier (2006) provide a very useful primer on the subdiscipline of critical cartography. Crampton (2001, 2011), Harley (1988), and Wilson (2017) collectively describe relationships between mapping practices, technologies, and systems of spatial power, through useful historical examples. [While I highly recommend Wilson's (2017) *New Lines* in full, for our purposes you can focus your attention on Chapters One, Two, and Five.] On the spatial-representational implications of different digital technologies and data infrastructures, see Aurigi (2005), Bates (2018), Batty (1997), Ford and Graham (2016), Mattern (2014), Presti (2018), and Zasina (2018). For specific discussion on implications for governance and policy, see Gil-Garcia *et al* (2017), Lindquist (2017), and Ruppert (2018). Lastly, Kitchin and McArdle (2018) examine the creation and use of data-backed "dashboards" for urban research and action.

Aurigi, A. (2005). Competing urban visions and the shaping of the digital city. *Knowledge, Technology & Policy, 18*(1), 12–26.

Bates, J. (2018) Data cultures, power and the city. In Kitchin, R., *et al.* (Eds.), *Data and the City* (pp. 190-200). London; New York: Routledge.

Batty, M. (1997). The computable city. *International Planning Studies, 2*(2), 155–173.

Crampton, J. W. (2001). Maps as social constructions: power, communication and visualization. *Progress in Human Geography*, 25(2), 235–252.

-----. (2011). Cartographic calculations of territory. *Progress in Human Geography*, 35(1), 92–103.

Crampton, J. W., & Krygier, J. (2006). An Introduction to Critical Cartography. *ACME: An International E-Journal for Critical Geographies*, 4(1), 11–33.

Ford, H. and M. Graham. (2016) Semantic cities: Coded geopolitics and the rise of the Semantic Web. In Kitchin, R., & Perng, S.-Y. (Eds.). *Code and the City*. (pp. 200-214) London; New York: Routledge, Taylor & Francis Group.

Gil-Garcia, J.R., *et al.* (2017) Policy Analytics: Definitions, Components, Methods, and Illustrative Examples. In J.R. Gil-Garcia, *et al.* (Eds.), *Policy analytics, modelling, and informatics: innovative tools for solving complex social problems* (pp. 1-16). New York, NY: Springer Science+Business Media.

Harley, J. B. (1988). Maps, Knowledge, and Power. In D. Cosgrove & S. Daniels (Eds.), *The Iconography of Landscape* (pp. 277–312). Cambridge: University of Cambridge Press.

Kitchin, R. and G. McArdle. (2018) Urban data and city dashboards: Six key issues. In Kitchin, R., *et al.* (Eds.), *Data and the City* (pp. 111-126). London; New York: Routledge.

Lindquist, E.A. (2017) Visualization practice and government: strategic investments for a more democratic governance. In J.R. Gil-Garcia, *et al.* (Eds.), *Policy analytics, modelling, and informatics: innovative tools for solving complex social problems* (pp. 225-246).

Mattern, S. (2014). Interfacing Urban Intelligence. *Places Journal*. https://placesjournal.org/article/interfacing-urban-intelligence/

Ruppert, E. (2018) Where are data citizens? In Kitchin, R., *et al.* (Eds.), *Data and the City* (pp. 201-212). London; New York: Routledge.

Presti, L. L. (2018). "Seensing" maps and data through art. *Journal of Research and Didactics in Geography*, 2(7), 119–134.

Wilson, M. W. (2017). *New lines: critical GIS and the trouble of the map*. Minneapolis: University of Minnesota Press.

Zasina, J. (2018). The Instagram Image of the City. Insights from Lodz, Poland. *Bulletin of Geography. Socio-Economic Series*, (42), 213–225.

Weeks 4-14 **CASE STUDIES**

The semester's case studies are covered in two-week increments. The structure of those meetings will be consistent (see below).

Data Production: In the first meeting, assigned students will deliver an in-class presentation of the case study, building upon the readings, and paying particular attention to the technologies, infrastructures, systems, devices, and mechanisms by which data is culled from urban environments or otherwise produced within them. This presentation should define relevant terms, with concrete examples from a variety of contexts, and establish the parameters for a critical discussion on data-producing urban systems. Questions raised by the presentation should include how these systems are designed, by whom, toward what end(s), and with what effect(s). Students not presenting should approach the readings to prepare to answer and discuss these specific questions.

Data Representation: In the second meeting, we will build on the previous discussion with an in-class presentation (delivered by assigned students) regarding the ways in which data is used with respect to the case study topic. The presentation should focus on techniques of analysis, visualization, and engagement, as well as arenas in which these data are employed to support decision making (and, thus, their political role). We will conclude the topic with a discussion that synthesizes the two presentations, considering the feedback mechanisms explicitly or implicitly operating via these systems in the (re)production of urbanism in the 21st century.

12 – 19 Feb **Mobility, Transit, and Traffic**

12 Feb: Data Production
19 Feb: Data Representation

Discussion Notes: Following the two-week Case Study discussion outline, the Mobility, Transit, and Traffic case is taken as our seminar's "low-hanging fruit." The readings below will underpin our conversations about (a) transit and traffic management and the data infrastructures that support their flows and (b) the datascapes produced by urban mobility systems more broadly (including mobile computing technologies and location-based, GSP-enabled devices and services). In addition to the foundation provided by the reading list, students should prepare by bringing example projects (planned and/or implemented) for discussion, from previous experience or other courses. Consider the everyday technologies by which mobility is tracked and monitored and the many scales at which they operate—from the individual to the infrastructural; from the smart phone to the Federal Aviation Administration.

Reading Notes: Graham and Marvin (2002) offer an early overview of relationships and parallels between ICT and transportation infrastructures. Understanding mobility necessarily invokes the systems, platforms, and implications of mobile computing and location-based services. Toward that discussion, see Ciolfi and Avram (2016), Mackenzie (2016), and White (2016). In a larger discussion of big data in cities, Batty (2018) situates the use of such data within transit research and planning. Caragliu *et al* (2011) provide an operational definition of "smart cities" in order to evaluate several European instances, with a series of measures largely dependent on transit and mobility. Klauer and Söderström (2016) discuss empirical case studies (transit, as well as energy) through a Foucauldian framework of security. While Calvillo *et al* (2016) do not discuss transit and mobilities, specifically, monitoring movement and circulation is a substantial component of Songdo's infrastructure (and Songdo is a case we will discuss throughout the semester).

Batty, M. (2018) Data about cities: Redefining big, recasting small. In Kitchin, R., *et al.* (Eds.), *Data and the City* (pp. 31-43). London; New York: Routledge.

Calvillow, N. *et al*. Test bed as urban epistemology. In Marvin, S., *et al*. (Eds.). *Smart urbanism: utopian vision or false dawn?* London; New York: Routledge, Taylor & Francis Group.

Caragliu, A., Del Bo, C., & Nijkamp, P. (2011). Smart Cities in Europe. *Journal of Urban Technology, 18*(2), 65–82.

Ciolfi, L. and G. Avram. (2016) Digital social interactions in the city: Reflecting on location-based social networks. In Kitchin, R., & Perng, S.-Y. (Eds.). *Code and the City*. (pp. 91-104) London; New York: Routledge, Taylor & Francis Group.
Graham, S., & Marvin, S. (2002). Urban infrastructure and transportation. *Telecommunications and the City: Electronic Spaces, Urban Places* (pp.277-310). Routledge.
Klauer, F.R. and O. Söderström. (2016) Smart city initiatives and the Foucauldian logics of governing through code. In Marvin, S., *et al*. (Eds.). *Smart urbanism: utopian vision or false dawn?* London; New York: Routledge, Taylor & Francis Group.
Mackenzie, A. (2016) Code traffic: Code repositories, crowds and urban life. In Kitchin, R., & Perng, S.-Y. (Eds.). *Code and the City*. (pp. 73-88) London; New York: Routledge, Taylor & Francis Group.
White, J. M. (2016). Moving applications: a multilayered approach to mobile computing. In Kitchin, R., & Perng, S.-Y. (Eds.). *Code and the City*. (pp. 130-145) London; New York: Routledge, Taylor & Francis Group.

26 Feb – 5 Mar **Environment and Emergency**

26 Feb: Data Production
5 Mar: Data Representation

Final project/paper assignment description will be distributed via Canvas before 5 March. Read it thoroughly and bring questions to class that day.

Discussion Notes: With this topic, our discussions will "zoom out" to cover the second-most familiar planning use for data monitoring, analytics, and representation. We will consider the regional scales relevant for environmental questions and the longer timelines considered for preparedness. That said, the *condition* described by these scales warrants technological investment because of the impacts of *disruption* to that condition—which are acute and precise both spatially and temporally. Students should prepare to examine this topic through questions of precarity, risk mitigation, and spatiotemporal management; asking about the investments required (and the incentives for such resource-allocation) for the systems of both data production and representation. In other words, we will use this topic as our way of situating data systems and their development.

Reading Notes: The references in this list each have (thankfully) descriptive titles to help students plan their reading. Most have been selected for their expanded (although specific) conceptualization of the topics—beyond "sustainability" toward "environmentality;" beyond emergency preparedness or response and toward an understanding of discrete eruptions of perpetual crisis. Here are a few additional notes on some of them: Datta (2016) concretely positions environment with land and specifically discusses speed as a requisite response to crisis. In the conclusion to his book, Agrawal (2012) summarizes and describes technologies of environmental politics and governance. McNeill (2016) discusses the development of the IBM smart city platform(s) and its roots in, both, environmental monitoring and emergency management. And, lastly, two specific examples: Pruyt *et al* (2017) describes a data-driven interactive tool for responding to the European refugee crisis (a decidedly different sort of environmental emergency), and Büscher *et al* (2016) recount lessons from the Haitian earthquake.

Agrawal, A. (2012). Conclusion: The Analytics of Environmentality. *Environmentality: Technologies of Government and the Making of Subjects*. (pp. 201-230) Duke University Press.
Büscher, M. *et al.* (2016) Digital urbanism in crisis. In Kitchin, R., & Perng, S.-Y. (Eds.). *Code and the City*. (pp. 163-177) London; New York: Routledge, Taylor & Francis Group.
Datta, A. (2016) The smart entrepreneurial city: Dholera and 100 other utopias in India. In Marvin, S., *et al*. (Eds.). *Smart urbanism: utopian vision or false dawn?* London ; New York: Routledge, Taylor & Francis Group.
Gabrys, J. (2014). Programming Environments: Environmentality and Citizen Sensing in the Smart City. *Environment and Planning D: Society and Space, 32*(1), 30–48.

Graham, S., & Marvin, S. (2002). Telecommunications—The neglect of urban environmental issues. *Telecommunications and the City: Electronic Spaces, Urban Places* (pp.241-255). Routledge.
Massumi, B. (2009). National Enterprise Emergency: Steps Toward an Ecology of Powers. *Theory, Culture & Society, 26*(6), 153–185.
McNeill. (2016) IBM and the visual formation of smart cities. In Marvin, S., *et al*. (Eds.). *Smart urbanism: utopian vision or false dawn?* London ; New York: Routledge, Taylor & Francis Group.
Pruyt, E., *et al*, (2017) On the spot and map: Interactive model-based policy support under deep uncertainty. In J.R. Gil-Garcia, *et al.* (Eds.), *Policy analytics, modelling, and informatics: innovative tools for solving complex social problems* (pp. 315-342). New York, NY: Springer Science+Business Media.

12 – 26 Mar **Crime, Policing, and Security**

12 Mar: Data Production
19 Mar: No Class – Spring Break
26 Mar: Data Representation

Discussion Notes:
Along with a discussion of the technologies of surveillance and policing, this topic will begin a more explicit investigation into the impacts and effects of visualization on and within cities. Our sessions will build on our previous topics (namely, with respect to the questions of technological scale, structural condition, and urban governance), continuing our focus on technological infrastructure, to turn our focus on data representation as a research tool, an instrument of critique, and a mode of advocacy. Students should prepare for discussion with this intersection in mind, noting that these readings include a number of representational project examples aimed at multiple audiences, in addition to texts that explain or summarize particular technologies and concepts.

Reading Notes:
For general readings on surveillance (at multiple scales) and criminal justice, see Chung and Zeng (2017), Graham and Marvin (2002), Scassa (2018), Suchman *et al* (2017), and Van den Braak and Choenni (2017). Kurgan (2013) includes particularly relevant chapters (separately cited below): The first on surveillance in South Africa and the second on US incarceration practices. Gelman *et al* (2007), Goel *et al* (2016), Keefe (2011), and Stolper and Jones (2018) each include data-driven analysis of “stop-and-frisk” policing practices and should be read in comparison. Lastly, Gallagher *et al* (2017) is a recent, drawings-heavy report and proposal for what might follow the closure of NYC’s Rikers Island Correctional Facility. And, in the interest of full disclosure: Meisterlin (2018) was my review of that report, which directly speaks the role of representation with respect to criminal justice infrastructure, with an (albeit essayistic) embedded critique of the circulation of information across social media.

Chung, W. and D. Zeng, (2017) Social-media-based policy informatics: Cyber-surveillance for homeland security and public health informatics, In J.R. Gil-Garcia, *et al.* (Eds.), *Policy analytics, modelling, and informatics: innovative tools for solving complex social problems* (pp. 363-385). New York, NY: Springer Science+Business Media.
Gallagher, D., *et al.* (2017.). *Justice In Design: Toward a Healthier and More Just new York City Jail System*. New York: Van Alen Institute. https://www.vanalen.org/content/uploads/2017/07/Justice-in-Design-Report.pdf
Gelman, A., Fagan, J., & Kiss, A. (2007). An Analysis of the New York City Police Department’s “Stop-and-Frisk” Policy in the Context of Claims of Racial Bias. *Journal of the American Statistical Association, 102*(479), 813–823.
Goel, S., Rao, J. M., & Shroff, R. (2016). Precinct or prejudice? Understanding racial disparities in New York City’s stop-and-frisk policy. *The Annals of Applied Statistics, 10*(1), 365–394.
Graham, S., & Marvin, S. (2002). Social surveillance and the city. *Telecommunications and the City: Electronic Spaces, Urban Places* (pp.213-227). Routledge.
Keefe, J. (2011). WNYC: Stop & Frisk by Precinct [Interactive Map]. https://project.wnyc.org/stop-frisk-map-2011/index.html

Kurgan, L. (2013). Cape Town, South Africa, 1968: Search or surveillance?. *Up Close at a Distance: Mapping, Technology, and Politics*. (pp. 97-111) New York: Zone Books.
-----. (2013). Million Dollar Blocks. *Up Close at a Distance: Mapping, Technology, and Politics*. (pp. 187-204) New York: Zone Books.
Meisterlin, L. (2018). Not Yet #AfterRikers: Looking for #JusticeInDesign. *The Avery Review*, (32). Retrieved from https://www.averyreview.com/issues/32/not-yet-after-rikers
Scassa, T. (2018). Crime data and analytics: Accounting for crime in the city. In Kitchin, R., *et al.* (Eds.), *Data and the City* (pp. 59-71). London; New York: Routledge.
Stolper, H., & Jones, J. (2018). The Enduring Discriminatory Practice of Stop and Frisk: An Analysis of Stop-and-Frisk Policing in NYC. New York: Community Service Society. Retrieved from http://www.cssny.org/news/entry/stop-and-frisk.
Suchman, L., Follis, K., & Weber, J. (2017). Tracking and Targeting: Sociotechnologies of (In)security. *Science, Technology, & Human Values, 42*(6), 983–1002. https://doi.org/10.1177/0162243917731524
Van den Braak, S. and S. Choenni, (2017) Development and use of Data-Centric Information Systems to Support Policymakers: Applied to Criminal Justice Systems. In J.R. Gil-Garcia, *et al.* (Eds.), *Policy analytics, modelling, and informatics: innovative tools for solving complex social problems* (pp. 99-121). New York, NY: Springer Science+Business Media.

2 April **Class TBD**

Final Project or Paper Description DUE by 5PM on Tuesday, 2 April.

9 – 23 Apr **Home and Housing**

9 Apr: Data Production
16 Apr: Mark Wasiuta, "Control Syntax & Computational Governmentality" guest lecture.
23 Apr: Data Representation

In preparation for the guest lecture, read:

Wasiuta, M., & Lotfi-Jam, F. (2018). Unstable Control. *E-Flux Journal*. https://www.e-flux.com/architecture/structural-instability/208702/unstable-control/

Discussion Notes: We will end our seminar by "connecting the dots" between the major themes of the semester—infrastructures and environmentality; conditions, disruptions, and precarity within urbanism; scalar relationships and multidirectional technologies; and of course, the relationship between landscapes of data production and those of data representation—and locating them within the simultaneously discrete and ubiquitous case of housing. As the "fundamental land use" and sole constant across all cities, we will "zoom in" to the question of house and home. To prepare for discussion, students should critically revisit prior readings (in addition to consulting the list below) and approach this topic as synthetically as possible. Note that this topic's reading list is comparably short. This is, in part, to allow students to focus on the development of their final projects/papers. It is supplemented with the following notes on what is *not* in the reading list.

Not in the Reading List: (1) The open-access Internet is awash with papers, articles, reports, and marketing propaganda regarding "connected homes" and with advertised products, reviews, and proposals for more sensing technology within housing projects and within individual homes. These are not included in this reading list. That said, I trust that students are familiar with the consumer landscape relevant to the topic. If you are not, please take a moderate moment to gather the primary examples (*e.g.*, Amazon's Alexa or Google's Home; Nest or its competitors; endlessly advertised home security systems, etc). (2) The reading list does not include the expected prominent examples of 20th-century technologically enabled design projects relevant to domestic life and how we would or could live together. Again, I trust students are familiar with this history. If not, I encourage you to revisit projects such as Superstudio's Continuous Monument, Buckminster Fuller's Dymaxion House, and Constant's New Babylon.

Reading Notes: Harper, ed. (2003) is an excellent compilation of contextualizing chapters. At a minimum, students should consult Aldrich's "Smart Homes: Past, Present, and Future" (chapter 2) for an overview of the development of the "smart home" concept through the twentieth century. Graham and Marvin (2002) connect the home to the city through ICT. Marques (2018)

discusses the application of data analysis to planning in conditions of precarity. The Anti-Eviction Mapping Project (n.d.) and the Hack to End Homelessness (2014) both contain *several* projects of data analysis and visualization. (Note that these sites take time to critically "read.")

Anti-Eviction Mapping Project. (n.d.). Anti-Eviction Mapping Project. https://www.antievictionmap.com/

Graham, S., & Marvin, S. (2002). The home as a locus of urban social life. *Telecommunications and the City: Electronic Spaces, Urban Places* (pp.206-213). Routledge.

Hack to End Homelessness. (2014). Hack to End Homelessness – Seattle, WA. http://www.hacktoendhomelessness.com/

Harper, R. (Ed.). (2003). *Inside the smart home*. London; New York: Springer.

Marques, E. (2018). Data on Rapidly Growing Cities: Lessons from planning and public policies for housing precarity in Brazil. In G. Bhan, S. Srinivas, & V. Watson (Eds.), *The Routledge companion to planning in the Global South* (pp. p70-79). London and New York: Routledge.

Week 15
30 Apr

SYNTHESIS
Final Project/Paper presentations and review.
All final deliverables are due at the start of class.

Appendix

Specific Tools and Tech

Li, D., *et al*. (2018). ECharts: A declarative framework for rapid construction of web-based visualization. *Visual Informatics, 2*(2), 136–146.

Speed, C. *et al.* (2018) Blockchain city: Economic, social, and cognitive ledgers. In Kitchin, R., *et al.* (Eds.), *Data and the City* (pp. 141-155). London ; New York: Routledge.

Data Types and Uses

Offenhuber, D. (2018) Sticky data: Context and friction in the use of urban data proxies. In Kitchin, R., *et al.* (Eds.), *Data and the City* (pp. 98-105). London ; New York: Routledge.

Verhoeff, N. and C. Wilmott. (2016) Curating the city: Urban interfaces and locative media as experimental platforms for cultural data. In Kitchin, R., & Perng, S.-Y. (Eds.). *Code and the City*. (pp. 116-129) London; New York: Routledge, Taylor & Francis Group.

Other Relevant Topics

Haklay, M. (2018) Beyond quantification: A role for citizen science and community science in a smart city. In Kitchin, R., *et al.* (Eds.), *Data and the City* (pp. 213-224). London; New York: Routledge.

Hollands, R. G. (2016) Beyond the corporate smart city? Glimpses of other possibilities of smartness. In Marvin, S., *et al*. (Eds.). *Smart urbanism: utopian vision or false dawn?* London ; New York: Routledge, Taylor & Francis Group.

Johnston, J. (2008). *The allure of machinic life: cybernetics, artificial life, and the new AI*. Cambridge, MA: MIT Press.

Lauriault, T. P. (2018) Ontologizing the city. In Kitchin, R., *et al.* (Eds.), *Data and the City* (pp. 171-186). London; New York: Routledge. [Cadastral mapping and ordnance surveys]

Manovich, L. (2016) Exploring urban social media: *Selfiecity* and *On Broadway*. In Kitchin, R., & Perng, S.-Y. (Eds.). *Code and the City*. (pp. 146-160) London; New York: Routledge, Taylor & Francis Group.

Powells, G. *et al.* (2016) Geographies of smart urban power. In Marvin, S., *et al*. (Eds.). *Smart urbanism: utopian vision or false dawn?* London; New York: Routledge, Taylor & Francis Group. [Energy]