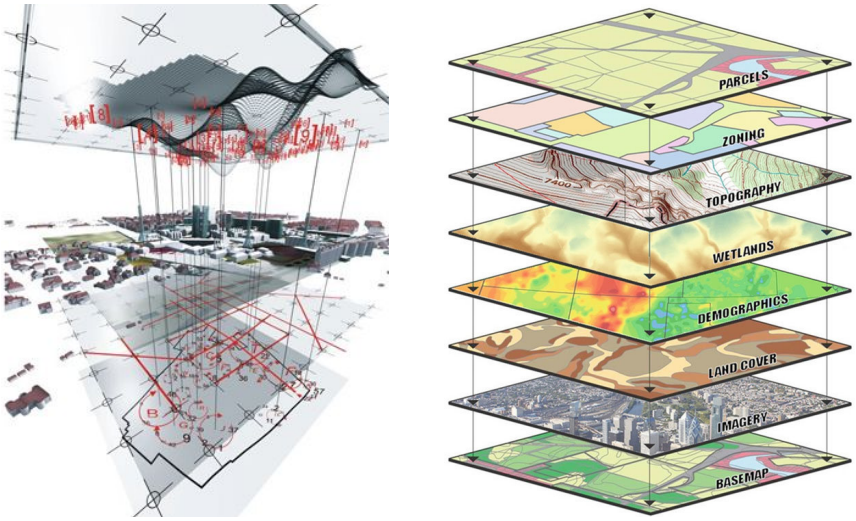
Mapping the Data-Driven City.

Barnard and Columbia Colleges Architecture Department
Spring Term B ARCH 3312 Special Topics in Architecture: Mapping the Data-Driven City
Meeting times: Tuesday/Thursday 10:10-12:55pm EST
Instructor: Diana Cristobal, dcristob@barnard.edu
Office Hours: By appointment

Forensic Architecture reconstruction of the "Black Friday" battle of August 1, during the Gaza War

Maps and data are shaping contemporary cities. Everything—from traffic, to consumer patterns, to social behaviors—is now subject to being recorded, analyzed, visualized, and even turned into algorithms that could calculate a future city. This information overload, coupled with our current obsession for data visualization and with quick advances in digital tools, has reconfigured the evidentiary regimes used by architects and urbanists. It is now routine in urban analyses to push the use of data under the guise of objectivity, efficiency, and universal applicability. But data mediated approaches that promise the betterment of urban spaces are far from neutral, and their ambivalent effects have also contributed to reinforce algorithmic discriminatory techniques—a widespread practice that has gained the tittles of "algorithms of oppression" (Safiya Umoja Noble), "weapons of math destruction" (Cathy O'Neil), or "automating inequality" (Virginia Eubanks). Learning how data and maps shape cities is a crucial task today. This hybrid course aims to address this question by analyzing visual techniques used to represent urban data, as well as the technologies that they rely upon. Students will explore such questions through the reading of historical and contemporary texts, and the making of composite digital models—that is, 4D urban models that embed maps, images, text, and videos—that reconstruct an urban research question.

EXERCISE: Composite map



Left: CHORA's map for Carlsberg, 2007. Right: Layers in a GIS model.

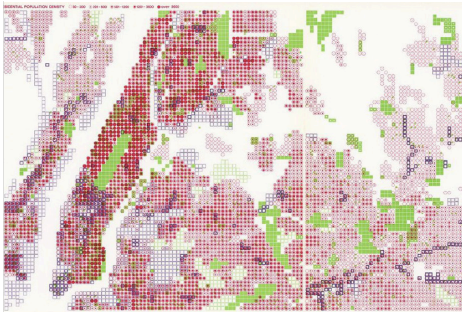
The goal is to conduct urban research through the production of digital "composite maps"—that is, a form of cartography that hybridizes different informational sources and formats (3d model, image, text, statistical data) and different scales (from urban furniture to infrastructure systems). The "composite" of widely diverse informational sources and modes of seeing will be used to challenge disciplinary claims on the autonomy of architecture representation tools, as well as more generic claims on the neutrality and objectivity of urban data. In the process of making these cartographies we will move beyond the notion of efficacy of communication between the map and the mapped, and engage also with the affective and subjective aspects of cartography. Experimenting with mapmaking conventions students will question the role of technology in the production of truth claims, while also evaluating the legibility of such technologies for different audiences.

The map needs to consider the following notions:

- Evidence: what constitutes evidence in urban analysis? Can the built environment, witness testimony, and statistical data be intertwined to articulate public claims?
- Data overload: what kinds of data-sets are relevant? how much is enough? How can your map avoid the depoliticizing and denaturalizing of data?
- Inhuman vision: your map needs to engage with tools used for visualizing data that go beyond the empirical.
- Resolution: how does your map display the limits of the technologies that it relies upon?
- Network: as a reaction towards the use of networks as tropes for nonhierarchical interconnection and democratic knowledge, your maps will question the notion of connectivity through the techniques of layering, juxtaposition and remix.

This exercise is comprised into (individual and group) assignments and weekly reviews. Pairs will be assigned based on each student's project preferences. Each student will receive an individual grade based on their work throughout the duration of the course and the final submission.

EX01A: Pecha Kucha: Mapping method & City (in pairs) 1WEEK

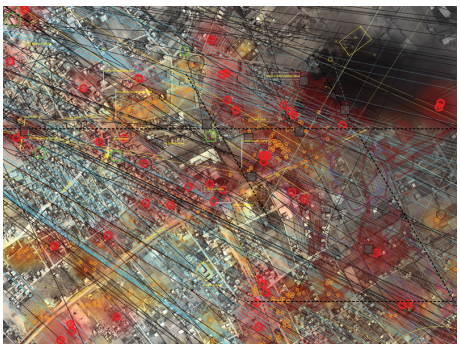


As a warm up toward the production of urban maps, students will select one urban neighborhood and one mapping "method" from a list of contemporary and historical examples. Students will then present their case studies as a Pecha Kucha presentation.

EX01B: Data Gathering (in pairs) 1WEEK

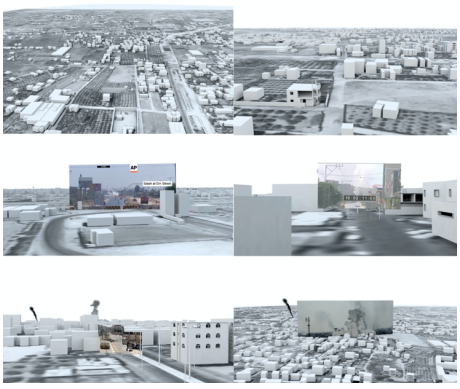
Students will then formulate a research question and compile information from different sources and formats, including social media platforms, images, video, texts, historical maps, etc. The idea is not to collect as much information as possible, but to be selective in relation to the research topic, and to speculate as to how different formats can complement each other in order to build a narrative.

EX01C: Composite map (individual) 2WEEKS



Students will incorporate their different findings into a digital "composite map" comprised of a minimum of two layers. One layer will show physical evidence (urban furniture, pavements, facades, mobile architecture, atriums, etc.) and the other one will show non-physical evidence (statistical data extracted from GIS, hashtags from social media, personal interviews, newspaper's headlines and articles, etc.)

EX01D: Story board for animation + 15 sec. animation (individual) 2WEEKS



Students will then animate a fragment of their composite maps. The animation will be used to interrogate questions of information visualization (i.e. how can information be displayed *in time* to facilitate communication), as well as research questions that consider specific *timelines* (i.e. if you are researching grassroots movements, you might want to investigate the history of such movements in New York during the twentieth century, and focus in the temporality of one specific event.)

CALENDAR: *** The schedule is subject to adjustment during the course of the semester. ***

READING SEMINARS:
W1: Counter-maps / Evidence
W2: Sensors / Smartness
W3: Satellites / Inhuman vision
W4: Numbers and algorithms / Quantification
W5: Urban games / Simulation
W6: Cameras / Animation

Tu March 9.	PRESENTATION	Intro to class
Th March 11	SEMINAR	Counter-maps / Evidence
	INVITED SPEAKER	Guest speaker
Tu March 16	SEMINAR	Sensors / Smartness
	PRESENTATION	Smart City
	TUTORIAL	QGis
Th March 18	PIN-UP	EX01A: Pecha Kucha: Mapping method + city
Tu March 23	SEMINAR	Satellites / Inhuman vision
	PRESENTATION	View from above & view from below
	TUTORIAL	Modeling Rhino
Th March 25	DESKCRITS	EX01B: Data Gathering
Tu March 30	SEMINAR	Numbers and algorithms / Quantification
	INVITED SPEAKER	Guest speaker
Th April 1	PIN-UP	EX01C: Layer 1
Tu April 6	SEMINAR	Urban games / Simulation
	PRESENTATION	History of urban games
Th April 8	PIN-UP	EX01C: Layer 2
Tu April 13	SEMINAR	Cameras / Animation
	TUTORIAL	Animating 2D and 3D
Th April 15	WORKSHOP / DESKCRITS	EX01D: Storyboard
Tu April 20	DESK-CRITS, IN CLASS WORK	
Th April 22	Final review, EX01	

WEEKLY READING ASSIGNMENTS

Each Tuesday we will conduct a seminar discussion, for which assigned readings should be complete. Weekly reading responses are to be submitted by 5pm the afternoon before your seminar (Monday). Responses should be around 250 words. They should be guided by the thematic "word" of the week and comment on one or more of the required texts by highlighting a specific issue, passage, question, or feature of the argument.

READINGS

W1: Counter-maps / Evidence

1. James Corner "The agency of mapping" in ed. Denis Cosgrove *Mappings* (London: Reaktion Books, 1999.) 6 p
2. Denis Wood "Talking back to the map" in *Rethinking the Power of Maps* (New York: The Guilford Press, 2010) 22 p
3. Read Laura Kurgan "Cities full of data: A preface" in *Ways of Knowing Cities* (Columbia books, 2019) (6 p)
4. VIDEO (5min) "Forensic Architecture: Where art meets activism - BBC Newsnight" https://www.youtube.com/watch?v=ehvtpGzF1r4
5. VIDEO (1h) "Methods and Tools for Visual Investigations" https://forensic-architecture.org/programme/events/logancij16-methods-and-tools-for-visual-investigations

W2: Sensors / Smartness

1. Orit Halpern "The Smartness Mandate" in *Grey Room, n68* (*Summer 2017*): (13 p)
2. Shannon Mattern "A city is not a Computer" in PacesJournal (February 2017) (11 p)
3. Orit Halpern w/Gokce Gunel "Demoing unto Death: Smart Cities, Environment, and Preemptive Hope," *Fibreculture* Issue 29, (2017): (14 p)

Further reading:

- Orit Halpern "Architecture as Machine: The Smart City Deconstructed" in *When is the Digital in Architecture?* (Montréal : Canadian Centre for Architecture; Berlin : Sternberg Press, 2017): 125-175
- Evangelos Kotsioris "Sensing Architecture" in *Perspecta 51*:227-243

W3: Satellites / Inhuman vision

1. Antoine Picon, *Mapping the Future of Cities* (3 p)
2. Laura Kurgan, *Close up at a Distance:* (+- 28 p)
3. Matthew Wilson, *OXAV* (3 p)
4. James Corner, *Taking Measures* (4 p)

Further reading:

- Michalis Pirokka et al, Personal Remote Sensing

W4: Numbers and pixels / Quantification

1. Reinhold Martin, "On numbers, more a less" in: Matthew Poole and Manuel Shvartzerg, eds., *The Politics of Parametricism: Digital Technologies in Architecture* (London and New York: BloomsburyAcademic, 2015), chap. 2.
2. Mario Carpo, "Drawing with Numbers: Geometry and Numeracy in Early Modern Architectural Design, *Journal of the Society of Architectural Historians*, Vol. 62, No. 4 (Dec., 2003), pp. 448-469 (23 p)
3. Matthew Wilson, "OXAV*"* in *New Geographies*, *Geographies of Information,* n. 7 (October 2015): 175-177 (3p)

Further reading:
- Porter, T. M. *Trust in Numbers*, excerpt
- Computer Graphics staff, Programs available from Harvard, Newsletter ACM SIGGRAPH Computer Graphics, Volume 7 Issue 1, Spring 1973

W5: Games / Simulation

1. Valerie Frissen, Jos de Mul and Joost Raessens, "Homo Ludens 2.0: Play, Media and Identity" in *Contemporary Culture* (15 p)
2. R.L. Meier "Game Procedure in the Simulation of Cities" in *The Urban Condition* (8 p.)
3. J. Kim, "These board games play out how climate change will reshape our cities" in *Fastcompany*, https://www.fastcompany.com/90323110/these-board-games-play-out-how-climate-change-will- reshape-our-cities (2 p)
4. D. Popoff "The Cities Game," *Psychology Today* vol. 2 n3, (August 1968) (2 p)
5. A. G. Feldt "The Cornell Land Use Game," (Center for Housing and Environmental Studies, Cornell University, New York, 1964) (6 p)

Further Reading:
- Jean Baudrillard, "Simulacra and Simulations"
- R.D. Duke, "Gaming Simulation for Urban Planning" *Journal AIP,* vol 32, n1, (Jan 1969)

W6: Cameras / Animation

1. Watch this panel discussion on "maps" for the publication *Ways of Knowing Cities* that GSAPP just published. Skip the introductions (begin min. 3:00) but watch the questions: (1 hour)
   https://www.youtube.com/watch?v=TSDbKnmwPB0
2. Watch Eve Blau's presentation on the exhibition "Urban Intermedia" that Harvard organized in 2018, and Laura Kurgan's presentation on her work at the Center for Spatial Research. https://www.youtube.com/watch?v=KyrDt3dptlw
   Watch these parts:

   a. min 14:30-26:00 (20min)
   b. min 46:50- 1:00 (15min)

3. Watch Robert Pietrusko's presentation on the exhibition "Urban Intermedia." Watch from min 7:00-31min. https://www.youtube.com/watch?v=4NIe7rIepwU (25min)

PREREQUESITES
All students must have completed an architectural design studio prior to taking this class. You should also be familiar with Rhino, and basic knowledge of illustrator and Photoshop is recommended.

STUDENT LEARNING OBJECTIVES
1. Visually communicate architectural concepts and research using discipline-specific techniques
2. Work independently and in collaborative groups on design research projects
3. Verbally and visually communicate architectural concepts in multiple media formats
4. Formulate and conduct research related to technology, media, and architecture.
5. Utilize multimedia techniques to present a final project that incorporates research and a concise thesis on the class thematic.
6. Work between theoretical texts and architectural propositions
7. Demonstrate an understanding of theoretical texts through reading responses and thoughtful class participation.

COURSE REQUIREMENTS, EVALUATION, AND GRADING
Standard expectations for full attendance and completion of all assignments apply. Grades will be based upon a combination of the weekly reading responses, weekly exercises, midterm and final project presentations, participation both in seminars and workshop critiques, and a general commitment to engaging in debate and discussion about the subject matter. Thoughtful class participation is essential. If you are not comfortable with speaking in class, please come to see me and discuss other ways to contribute.

Grading will be as follows:
. 15% Seminar participation
. 15% Reading responses
. 10% EX01A
. 10% EX01B
. 40% EX01C Composite map
. 10% EX01D Animated composite map

TEACHING MODALITY.
Remote only – course takes place fully online.

ASYNCHORNOUS LEARNING.
This course will provide recorded tutorials and recorded presentations, so that students who cannot zoom at the proposed schedule can review these presentations at their own peace. We will also use the digital platform “miro,” where students will upload their weekly assignments and review each other’s work at their own times. Finally, when deskcrits are in place, the instructor will adapt the one-on-one meetings with the students within the provided schedule. However, assistance to the reading seminars, pin-ups and reviews is mandatory—so if you have problems with the proposed schedule please make sure to talk to the instructor on the first day of classes.

INSTRUCTIONS FOR ACCESSING APPORTO.

Barnard College Student Computing has implemented a new virtual computer lab platform, Apporto, that will provide students who are enrolled in architecture courses with remote access to the same academic software that is currently installed in the physical architecture computer lab (DAL) on campus.

In order to access these applications (e.g. Adobe Creative Cloud, Rhino 6, ArcGIS, etc.) please go to barnard.apporto.com and log in using your Columbia UNI and password. Once you are logged in, you will see two Virtual Lab desktop icons: BC GPU Virtual Desktop and BC Virtual Desktop. These two virtual environments have some common applications on both, but mostly contain different software for different types of classes. For software related to your architecture courses, please use BC GPU Virtual Desktop.

Instructions for requesting support and reporting problems:

- If you have any issues logging into Apporto with your Columbia UNI credentials, please review these pages regarding resetting your UNI password and contact CUIT directly if you are unable to resolve the problem on your own.
- If you can log into Apporto, but experience any issues opening or using the applications, please email BCIT at help@barnard.edu with a description of the problem and any relevant screenshots or screen recordings. Someone from BCIT will follow up with you directly to help you troubleshoot and resolve the issue.

REFERENCE WEBSITES FOR MAPPING EXCERCISES.

To download New York 3d Rhino models:

- Cadmapper: https://cadmapper.com/
- NYCDOIT: https://www1.nyc.gov/site/doitt/initiatives/3d-building.page

On New York Data Sets

- Museum of the City: data2go.nyc
- Zoning: https://zola.planning.nyc.gov
- Open Data: https://opendata.cityofnewyork.us/projects/
- Miscellaneous Data Sets: https://www1.nyc.gov/site/doh/data/data-sets/data-sets-and-tables.page

On Data Visualization Examples:

- https://www.kiln.digital/

POLICIES AND STATEMENTS:

HONOR CODE

The Barnard Honor Code applies to all students in this class regardless of academic affiliation. Approved by the student body in 1912 and updated in 2016, the Code states:

We, the students of Barnard College, resolve to uphold the honor of the College by engaging with integrity in all of our academic pursuits. We affirm that academic integrity is the honorable creation and presentation of our own work. We acknowledge that it is our responsibility to seek clarification of proper forms of collaboration and use of academic resources in all assignments or exams. We consider academic integrity to include the proper use and care for all print, electronic, or other academic resources. We will respect the rights of others to engage in pursuit of learning in order to uphold our commitment to honor. We pledge to do all that is in our power to create a spirit of honesty and honor for its own sake.

The Columbia College Honor Code and the Columbia College Faculty Statement on Academic Integrity can be viewed here:

https://www.college.columbia.edu/honorcode
https://www.college.columbia.edu/faculty/resourcesforinstructors/academicintegrity/statement

The Barnard Honor Code includes relevant language for the proper use of electronic class material:

We consider academic integrity to include the proper use and care for all print, electronic, or other academic resources.

To be clear, this means that any recorded class content — from lectures, labs, seminars, office hours, and discussion groups — is the intellectual property of your professor and your fellow students, and should not be distributed or shared outside of class

CLASS ATTENDANCE, LATE ARRIVALS, AND ABSENCES POLICY:

Attendance is mandatory at all scheduled classes. Class is held Tuesday and Thursday beginning promptly at 10:10 AM. Any student arriving after 10:20 AM will be considered 'late' and arrivals after 11:00 AM will be considered as absent. Absences due to acute illness, a personal crisis (e.g. a death in the family), religious observance, or for other reasons of comparable gravity may be excused. In all such cases, students must promptly email their instructor to communicate the reason for their absence and to arrange an opportunity to review any important information they may have missed. Students who know they will miss scheduled classes due to religious holidays should meet with their instructor during the first week of classes to discuss their anticipated absences. Unexcused absences, late arrivals, or early departures from class will reduce your course grade. Three consecutive absences or four nonconsecutive absences will mean that you have dropped the course, whether or not you have filed the appropriate "drop" form. Three non-consecutive absences will result in a grade reduction by one-third of one letter grade (e.g., A- to B+). Three consecutive absences or four non-consecutive absences will adversely affect your final grade.

CENTER FOR ACCESSIBILITY RESOURCES & DISABILITY SERVICES (CARDS) STATEMENT:
If you believe you may encounter barriers to the academic environment due to a documented disability or emerging health challenges, please feel free to contact me and/or the Center for Accessibility Resources & Disability Services (CARDS). Any student with approved academic accommodations is encouraged to contact me during office hours or via email. If you have questions regarding registering a disability or receiving accommodations for the semester, please contact CARDS at (212) 854-4634, cards@barnard.edu, or learn more at barnard.edu/disabilityservices. CARDS is located in 101 Altschul Hall.

AFFORDABLE ACCESS TO COURSE TEXTS STATEMENT:
All students deserve to be able to study and make use of course texts and materials regardless of cost. Barnard librarians have partnered with students, faculty, and staff to find ways to increase student access to textbooks. By the first day of advance registration for each term, faculty will have provided information about required texts for each course on CourseWorks (including ISBN or author, title, publisher, copyright date, and price), which can be viewed by students. A number of cost-free or low-cost methods for accessing some types of courses texts are detailed on the Barnard Library Textbook Affordability guide (library.barnard.edu/textbook-affordability). Undergraduate students who identify as first-generation and/or low-income students may check out items from the FLIP lending libraries in the Barnard Library (library.barnard.edu/flip) and in Butler Library for an entire semester. Students may also consult with their professors, the Dean of Studies, and the Financial Aid Office about additional affordable alternatives for having access to course texts. Visit the guide and talk to your professors and your librarian for more details.

WELLNESS STATEMENT
It is important for undergraduates to recognize and identify the different pressures, burdens, and stressors you may be facing, whether personal, emotional, physical, financial, mental, or academic. We as a community urge you to make yourself—your own health, sanity, and wellness—your priority throughout this term and your career here. Sleep, exercise, and eating well can all be a part of a healthy regimen to cope with stress. Resources exist to support you in several sectors of your life, and we encourage you to make use of them. Should you have any questions about navigating these resources, please visit these sites:

- Barnard Students: https://barnard.edu/wellwoman/about
- Columbia Students: http://www.college.columbia.edu/resources (Click on Health-Wellness)
- Columbia GS Students: https://gs.columbia.edu/health-and-wellness
- Columbia SEAS Students: http://gradengineering.columbia.edu/campus-resources

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