Urban Mobility Workshop

Bodies, Bits and the Last Mile

Thursdays, 3:00 – 5:00pm, Fayerweather 204

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> Office Hours:
> Wednesdays, 3 – 7p or by appointment.
> Book office hours at http://vanky.co/officehours

Summary

Large-scale human mobility data can be collected from mobile phones, road surveillance cameras, and location-based applications while opportunistic methods are revealing movement patterns from the data exhaust of our everyday lives. Turning such raw data into knowledge can provide insights about how cities (and its citizens) operate. The goal of this class is to expose you to general methods that extract useful information from digital traces of human movement. It covers numerical methods to ascertain the structure inherent in daily activities within a population. Lectures are reinforced with case studies and exercises, using data sets from actual applications. At the same time, we will critique and analyze the limitations of such data-centric methodologies to foster a more productive—and human-centered—definition of mobility.

Broadly, we question in what ways are current techniques of understanding human mobility failing to address questions of access, equity, and even pleasurability/sanity for those who have to move across the urban landscape? In what ways can digital data reveal patterns that may assist us in understanding the lived experience of mobility, and how can we leverage this information? In what ways do we evaluate and/or utilize (near) future solutions such as autonomy and distributed/networked mobility in the context of human-centrism?

This course is not intended to be a transportation modeling class, but rather an application of data analysis, locative technology development, data visualization and communication, and interpretation by drawing from the context and challenges of urban mobility. It is for that reason this course addresses a multitude of contexts—from public transportation data from open data platforms to sensor-generated data on activities in a discrete location within the public realm. Through readings and discussions, we will contextualize the opportunities for future practice as well as the limitations of these quantitative processes. The course will question policy, and theorize new mechanisms for evaluating mobility, holistically.

Learning Objectives

We will engage in the critical debates around data and planning to become conversant in these vital conversations of mobility and informatics and learn about how they are being considered through emerging planning practices. We will analyze the ethical implications of data-centric processes and develop responses to professional ethical situations in mobility with the overall ambition of informing future practice.

The class is structured as two parallel tracks, that will expose students to quantitative and policy-analysis tools and techniques:

Analytical: Ability to perform policy analysis regarding mobility; understand last-mile challenges in mobility planning; ability to conceptualize/design around aspects of equity and access;

Theoretical: Understand the policy discussions around challenges within mobility today in light of technological, service and expectation changes, and navigate their uncertain futures.

Prerequisites

For the quantitative half of the class, it is recommended that you have basic knowledge of coding and statistics, or the perseverance to find help/answers/resources as you need it. (In other words, you are willing to "hack" your way through the class.) Due to the wide variation is skillsets, the general mantra for the class is that course participants are required, at a minimum, to approach the activities and lectures with enthusiasm and/or perseverance.

Sprints, Assignments and Grading

Analytical Sprints

The class is organized as a series of sprints—each engaging with a topic of urban mobility through the perspective of how data is collected or interpreted. Working in groups, we hope to create a shared technical skill base on which everyone can develop their projects and/or their thinking in the latter parts of the class. Sprint 1 will consider traditional datasets, with a slant toward illuminating gaps in service. The second sprint will engage the plethora of digital data such, such as social media data, real-time data or open data as a means of understanding human movement. The third sprint revisits William H. Whyte and his investigation of discrete urban space through the use of sensor data and/or mobile phone data. It is not the intent that you will become an expert in all of these practices, but learn enough to begin to frame your inquiries in a knowledgeable and informed way. By working as a group, you will be able to draw from the collective strengths and interest of your colleagues.

In each sprint, we will begin with a topical introduction, and you will choose a research project for the sprint (a list will be provided with some ideas, but you may present your own). Projects are to be completed in groups in about three weeks, with technical lectures and hands-on sessions to aid you in the completion of the project. Each sprint will conclude with a demonstration or a presentation of your research findings through a short Pecha Kucha.

Research Interrogations Presentations

Each sprint will feature a session dedicated to the research and practices that inform contemporary (cutting edge) practices about data and mobility. One group will be asked to present the research papers or practice precedents; each group will offer one of each through the course of the semester. Groups should prepare for a 30-40 minute presentation, supported by slides, which explores urban mobility within the context of the materials presented. Presentations should touch upon the datasets, approaches, and methods utilized in the materials, and the context in which they operate. Groups are encouraged to introduce outside precedent projects and graphic/visual analysis in their presentations. The group must assess how the topics of the readings/projects contribute to an understanding or vision of contemporary practice, implications on society (including ethical and societal impacts), and speculate how and where the approach could be applied more broadly to mobility planning. The group will then kick off a 20-minute class discussion or activity related to the themes of the presentation.

Group Policy Briefings

As groups, you will take on the task of establishing the base for conversation around several topics around mobility as it pertains to the human-focused attributes of various modes: public transportation, transportation networked services (aka "shared" or "on-demand"), distributed systems (such as bikes, scooters), and pedestrian mobility. Where do we currently stand, and where is planning failing to address the needs of residents with this type of mobility? These presentations may present conversation and debates as we formulate metrics for the regulation and/or development of mobility options, and may be drawn from current events. These should dually serve as policy briefs and fodder for conversation.

Toward the end of the term, you will again revisit these topics with a slant toward the future. In what ways will these continue to shape the discussions around mobility, if at all. Part speculation, part information transfer, these discussions will help us think about mobility 4-10 years in the future.

Final Project

The last assignment of the course is dedicated to a final group project, with an agenda of your choosing and may draw from any/all of the lessons from the course. The focus will be framing the policy, planning and comprehensive considerations of a evolved-existing, or emerging form of mobility. In a sense, you will draw from challenges addressed from today, and supported with analysis, to address potential challenges and/or opportunity in urban mobility. The focus should be global, but New York City or the region as an anchor as you propose a framework for human-centered mobility.

Grading

Attendance and Participation …………..………………… 15%
Policy Briefings + Futures Presentations ………………..... 20%
Research Interrogations ………………………………… 15%
Sprint Problem Sets (10% each) ………………………… 30%
Final Project ……………………………………………. 20%

Schedule

		Sprint Cycle	Class Topic	Assignment Due
1	24-Jan	Sprint 0	Introduction	
2	31-Jan		Contextualizing Mobility	
			Defining Human-Centrism	
3	7-Feb	Sprint 1	Introduction: Transportation Data	
			Group 4: Research Presentation	
4	14-Feb		Criticalities of Spatial Data and Mobility	
			Group 1: Policy Briefing	
5*	*19-Feb*		LiPS Panel at 1:15p - NYC TLC	
6	21-Feb		*Group 2: Policy Briefing*	Assignment 1
			~~Assignment 1 Pecha Kuchas~~ Sharing is Caring	
7	28-Feb	Sprint 2	Introduction: Individual Trajectories	
			Group 3: Research Presentation	
8	7-Mar		Guest Speaker: Tom Matarazzo, PhD	
			Group 2: Research Presentation	
9	14-Mar		*Group 3: Policy Briefing*	Assignment 2
			~~Assignment 2 Pecha Kuchas~~ Quantified Travelers	
	21-Mar	Sprint 3	*Spring Recess*	
TBD	28-Mar		Arlene Ducao & MindRider	
			(AV at ACSA Conference)	
10	4-Apr		Human Mobility Networks	
			Group 1: Research	
11	11-Apr		*Group 4: Policy Briefing*	Assignment 3
			~~Assignment 3 Pecha Kuchas~~ Autonomy and Its Discontents	
12	18-Apr	Final Sprint	*Guest: Bill Heinzen, NYC Deputy Commissioner for Policy*	Final Project Proposal
13	25-Apr	Future Sprint	Groups 1+3	
14	2-May		Groups 2+4	
15	9-May		Final Project Presentations	Final Project