Design Portfolio

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I was testing the toolkit with kids to receive feedback. Photo credit to Andrew Yu.

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I was hosting a workshop to present CodingCards. Photo credit to Shirley Wang

In the class cohort I am part of in my school, we were trying to figure out factors that impact the health of our community, such as whether there exist small cliques and to what extent people have crystalized their friend groups. Instead of relying on moralizing language and subjective feelings, I want to design visualizations to promote greater understanding of the community network for everyone to productively discuss communal issues.

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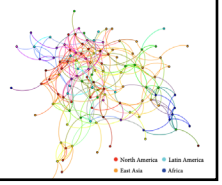

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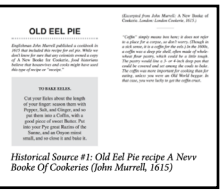
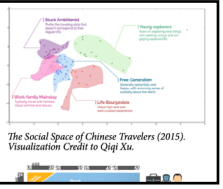


OLD EEL PIE

Historical Source #1: Old Eel Pie recipe A Nevv Booke Of Cookeries (John Murrell, 1615)

Global Slum Immersion is a series of efforts to document, historicize, and compare current and former slums worldwide. As I study and live in San Francisco, Berlin, Buenos Aires, Seoul, Hong Kong, Shenzhen, and London over the past four years, I have been taking notes on the under-resourced and redeveloped neighborhoods. My goal is to add nuances to the existing narratives about slums so that more people get to know the stories beyond the stereotpyes. I do this by contextualize the local sites from global cities within a broader social, political, and cultural history background and connect them a global discourse of slums.

As a part of a large human-centered design process at Airbnb to enter Chinese market, I worked on user research of Chinese travelers in order to understand who they are, what they like, and how they travel. I collaborated with two peers to identify and create user personas through qualitative and quantitative methods, along with the branding strategies and marketing solutions that were most relevant to each type. Therefore, one of my design goals is to come up with a generative framework that synthesizes and classifies the behavioral and user preference data I collected through a survey.



The Social Space of Chinese Travelers (2015). Visualization Credit to Qiqi Xu.

Education Design Toolkit for 1kg Box

Education Design Toolkit is a pack of cards and templates that provide inspirations and process guidance for anyone who wishes to be an educator to create a thematic class. I co-created this toolkit with the founder of 1kg Box to empower everyone to design community-based learning experience without being trained as a teacher.

My design partner and I realized that the most valuable learning experience is fun, explorative, and most importantly, rooted in local context and connected to one's daily life. Therefore, we followed a human-centered design process to identify problems, brainstorm ideas, prototype the toolkit with paper, and test it with volunteers. Instead of giving linear instructions, we designed the template in such that people will go through a series of questions to reflect and think in their context. The other medium is cards. We hope that by experimenting and recombining cards with various suggested topics, people can be inspired and feel ownership to what they designed. We also drew comics on the cards to make them more playful and intuitive. Besides joining the thinking process, I was responsible for collecting and transforming user feedback into iteration insights, curate a collection of activities, and designing the very templates that guide users through the thinking process of curriculum design.

View my internship story here (in Chinese).

I was testing the toolkit with kids to receive feedback. Photo credit to Andrew Yu.

The front and back of a single toolkit card. Photo credit to Xiaofan Liang.

One of the templates I created for curriculum design. Image credit to Xiaofan Liang

CodingCards

CodingCards is a set of practices that transforms Poker cards into teaching materials for learning basic coding concepts. I designed it to provide a playful, accessible, scalable solution for students to be familiar with computational thinking using only Poker cards, sticky notes, and pens. One card presents a variable that can be initialized as numbers, strings (with sticky notes), boolean (jokers), while suits indicate lists. Instead of thinking in abstract terms, students are asked to use these tools to perform simple coding tasks. Through the CodingCards, I hope students can not only learn coding concepts but more importantly, gradually grow interests and confidence in programming as a form of interactive and creative practice.

I developed CodingCards when I was teaching programming at Shenzhen Longgang Technical-vocational School in 2018. Many students at this school are from rural-urban migrant families and have low self-esteem due to constant failure in their studies. Computer interfaces are also foreign to some as they rarely have the opportunity to interact with them. Therefore, for them, learning to code is more than just a technical challenge. They also need to break through motivational and psychological barriers.

My inspirations to design CodingCards come from James Gleick's book *The Information: A History, a Theory, a Flood* and Seymour Papert's book *Mindstorms*. Gleick traced back the origin of information as bits and I associated bits with Poker cards because each card has two sides. Therefore, a standard deck of cards can be used to compute simple tasks. Papert's view of physicality as an integral part of learning had influenced my choice of medium. Poker cards as physical objects are inherently fun, intuitive, and familiar to many students. Instead of grappling with abstract concepts, students can play the "codes" and externalize their thoughts to cards when they get stuck. Teachers can also restock them easily. To improve the design, I iterated CodingCards several rounds with high school students from the technical schools and UWC Hong Kong, young professionals, and college students.

I was hosting a workshop to present CodingCards. Photo credit to Shirley Wang.

Students discussing how to use CodingCards. Photo credit to Xiaofan Liang.

An illustration of Rock Paper Scissor game logic. Photo credit to Xiaofan Liang.

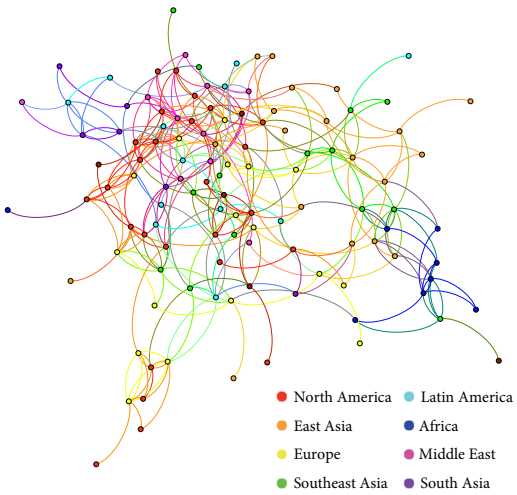
Network Visualisation

In the class cohort I am part of in my school, we were trying to figure out factors that impact the health of our community, such as whether there exist small cliques and to what extent people have crystalized their friend groups. Instead of relying on moralizing language and subjective feelings, I want to design visualizations to promote greater understanding of the community network for everyone to productively discuss communal issues.

To have a holistic and empirical view of our community friendship network, I collected self-reported friendship data for two years through survey and hashed the names to preserve anonymity. In total, 60% of the student body responded, and 95% of the population (out of 123 people) were identified. As a result, I created a report, in which I introduced the basics of graph reading, displayed the evolution of our community network, and analyzed it by various centrality metrics, region of origin, and reasons to be friends. I gave a presentation of the report in the community and synthesized a few suggestions for both individuals and our community as a whole to encourage further integration.

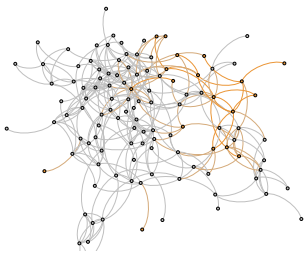
I found that people's socializing preference, for example whether to make friends through going to party and pubs, is the biggest driving factor that divide the community in half. Some other surprising insight also were used by both the student body and the staff to evaluate the state of mental health on a community level, and design particular housing policies and student experience activities. Now two peers have joined me to extend this project as a longitudinal study. We have been collecting friendship data annually and are planning to expand the analysis and visualize it on the web before graduation.

View the full report here.



Friendship network by region of origin. Credit to Xiaofan Liang.

Friendships established through being pub, party, or chilling buddies. Credit to Xiaofan Liang.



Friendship network of students from East Asia. Credit to Xiaofan Liang.

History Podcast

In aim of producing historically accurate stories that immerse people in the context of algorithms were created and used, I created the Podcast "Human Biases Behind Algorithms" to expand people's conception of algorithms as more than just indifferent and external computer objects, but also containers for human biases.

I begin the process by defining the nature of algorithms as a cookbook that receives inputs, processes them, and then output results. Then I brainstormed two artifacts that people can easily relate to and usually will not think of as algorithms, which are recipes and the factories' streamline production practices. After settling down the key comparisons, I searched for historical primary sources through which I can bring up the nuances and inspect the context. I believe that Podcast is the best medium for my goal as it uses accessible language and provides enough time to go in-depth with a few discussions. People can also listen closely to the historical sources I chose, a recipe and a letter, as I guided their attention throughout the Podcast. The structure of the narratives starts from a recent example showing how people misused algorithms and thus led to 2008 financial crisis. It shatters people's stereotypes on algorithms as something mechanical and inhuman. The story then flows from one source to another, connecting various perspectives across time, unraveling how people framed, interpreted, and used algorithms in different forms.

Listen to the full Podcast here.
Read Podcast transcript here.

OLD EEL PIE

Englishman John Murrell published a cookbook in 1615 that included this recipe for eel pie. While we don't know for sure that any colonists owned a copy of A New Booke for Cookerie, *food historians believe that housewives and cooks might have used this type of recipe or "receipt."*

TO BAKE EELES.

Cut your Eeles about the length of your finger: season them with Pepper, Salt, and Ginger, and so put them into a Coffin, with a good piece of sweet Butter. Put into your Pye great Razins of the Sunne, and an Onyon minst small, and so close it and bake it.

(Excerpted from John Murrell: A New Booke of Cookerie. *London: London Cookerie, 1615.)*

"Coffin" simply means box here; it does not refer to a place for a corpse, so don't worry. (Though in a sick sense, it is a coffin for the eels.) In the 1600s, a coffin was a deep pie shell, often made of whole-wheat flour pastry, which could be a little tough. The pastry would line a 3- or 4-inch deep pan that could be covered and set among the coals to bake. The coffin was more important for cooking than for eating, unless you were an Old World beggar. In that case, you were lucky to get the coffin crust.

Historical Source #1: Old Eel Pie recipe A Nevv Booke Of Cookeries (John Murrell, 1615)

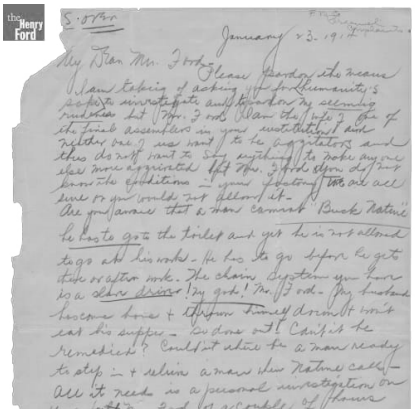
Jonathan: This sounds so…..old-fashioned! Who eats eels in pies today?

Xiaofan: Well, British people in 1600s did. This is a recipe taken from a cookbook published by John Murrell in 1615 England. West Europeans loved eel so much back then. England's King Henry I even died from eating a "surfeit of lampreys".[4] Now think about the seasoning mentioned in the recipe. Pepper, Salt, and Ginger. At that time, Pepper can only be shipped from India and thus considered a luxury in Europe. It's also the reason that Columbus sailed to the Americans because the turks blocked the spice trade routes. Ginger is another eastern spice that Britain mainly imported from China or India. From the way British designed this recipe, the ingredients they used, I can feel the elegance and proudness behind: it's meant for the upper class British to demonstrate their power. However, when the British colonists brought this recipe to America, the usage scenario for the recipe changed. Imagined you were one of the English colonists in New England in the 17th century, an eel pie was most likely served on a spring dinner with some winter savory from the garden[5].

Jonathan: why a spring dinner?

Xiaofan: Because back then, food availability was bounded by season! Eels usually swim toward the coast and enter the freshwater rivers in the spring from the cold Atlantic Ocean, which makes it perfect for harvest in Spring.[6] British colonists were elated to discover the abundance of eels in New England area and eel pie soon become a family food, a classic dish on the colonists' dinner table.[7] Going through the steps of cooking an eel pie is less about elegance or proudness anymore, it's a cultural lingering through which the New England immigrants can exercise their remaining British identities one more time. Interestingly, eel pie seems to lost its favor when America became independent because it people considered it as a colonial legacy, a symbol that is practiced by the "other."[8] However, what's absence from this story is really how native Americans consume eels. All we have heard so far is the British

An excerpt from the Podcast Transcript



Historical Source #2: Letter to Henry Ford from the Wife of An Assembly Line Worker (Benson Ford Research Center, 1914).

Global Slum Immersion

Global Slum Immersion is a series of efforts to document, historicize, and compare current and former slums worldwide. As I study and live in San Francisco, Berlin, Buenos Aires, Seoul, Hong Kong, Shenzhen, and London over the past four years, I have been taking notes on the under-resourced and redeveloped neighborhoods. My goal is to add nuances to the existing narratives about slums so that more people get to know the stories beyond the stereotpyes. I do this by contextualize the local sites from global cities within a broader social, political, and cultural history background and connect them a global discourse of slums.

Photo taken at Villa 31, Buenos Aires (2017). Credit to Xiaofan Liang.

To achieve this goal, I usually start by choosing the most notorious slums in the cities that still located at the center today. Then I will visit the areas, take photos, walk around, and try to have a conversation with the local residents. By analyzing the field notes, photography, satellite images, and GoogleMaps, I was able to summarize the spatial syntax of the location and raise interesting questions that guide my research. As a result, my writings about the sites focus on how a social and spatial identity arise in these neighborhoods from the interplay between the built environment and human agency. I also compared and contrasted these sites to distill the shared patterns of their formations and the peculiarities in each case. In addition to writing, I actively engage and publish my findings on public platforms (e.g., history pins, Wikipedia, and online exhibitions) so that people can memorized and interpreted the often neglected or biased history of these neighborhoods in a different light. A few of the examples are listed below.

Photo taken at Nantou Urban Village, Shenzhen (2018). Credit to Xiaofan Liang.

Wikipedia: Urban Village (China)
History Pin: Cesac Villa 31
Comparative Analysis of Nantou Urban Village in Shenzhen and Villa 31 in Buenos Aires
Online Exhibition: Poverty Maps—The Mapping History of Urban Poor in London

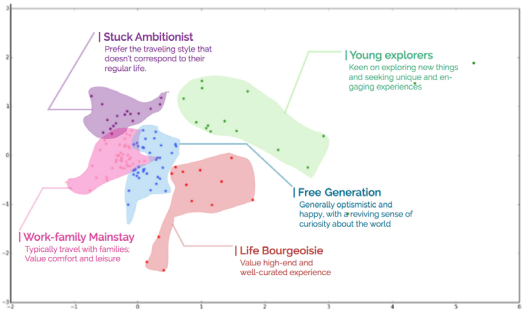
Photo taken at Huam Dong, Seoul (2017). Credit to Xiaofan Liang.

User Research for Airbnb

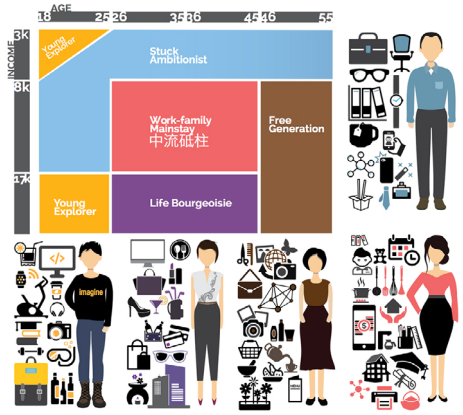
As a part of a large human-centered design process at Airbnb to enter Chinese market, I worked on user research of Chinese travelers in order to understand who they are, what they like, and how they travel. I collaborated with two peers to identify and create user personas through qualitative and quantitative methods, along with the branding strategies and marketing solutions that were most relevant to each type. Therefore, one of my design goals is to come up with a generative framework that synthesizes and classifies the behavioral and user preference data I collected through a survey.

I applied Bourdieu's theory of social space—a spatial construct of people's tastes along the axes of cultural and economic capital—to conceptualize the "social distance" of different user behaviors. Using multiple correspondence analysis on survey responses, I generated a social space image that showed the clustering of different traveling behaviors and derived five generic user categories of Chinese travelers -- young explorer, stuck ambitionist, work-family mainstay, free generation, and life bourgeoisie. Other qualitative methods, such as interviews, surveys, and participant observation, confirmed and complemented the interpretations of the classification. Moreover, the qualitative information showed that age and income, instead of Bourdieu's cultural and economic capital, can better explain the differentiation between Chinese travelers. In the end, I created a structured persona for each user type, which includes a narrative of socio-economic background, mindset for life, traveling behaviors, and accommodation preferences.

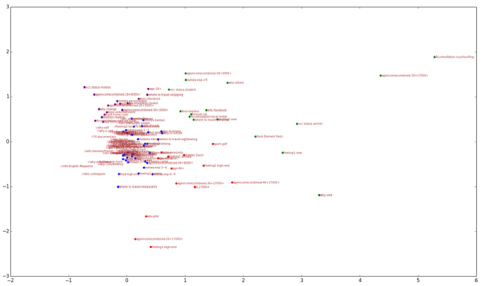
View a shortened version of the final report to Airbnb. Read a writing sample of this case study here.



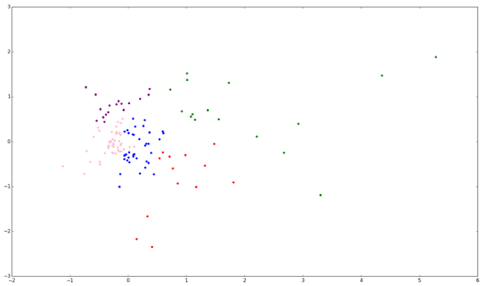
The Social Space of Chinese Travelers (2015). Visualization Credit to Qiqi Xu.



The Personas for each traveler type (2015). Visualization Credit to Qiqi Xu.



The generic image of social space, annotated with survey responses. Credit to Xiaofan Liang.



The generic image of social space, without survey annotation. Credit to Xiaofan Liang.