A Self-Expressive Station: Examining Role of Human and Computer Aided Site Observation in Urban Space

Abstract, Literature Review and Methods

by

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TABLE OF CONTENT

1

Abstract

2

Social Implications of Technological Developments in Cities
An Intro to Computational City Management
“Quantifying Everything” as Today’s Popular Method of Developing Cities
Top Down Design Wave in Today’s Smart Cities
Understanding People in Urban Spaces

3

Urban Observation Precedents
Site: University Station
Site Observation Method and Results
Intervention: An Observation Platform

4

Bibliography

1

Abstract

By 2050, roughly 66 percent of the world's population is expected to live in cities (UN 2014). Many cities are redefining their urbanization processes. Today's most popular models of city management introduce predefined management systems—black boxes--designed by famous engineering companies for cities. The current trend of the corporate model of a "smart city," which Antony Townsend defines as "places where information technology is wielded to address problems old and new," treats humans as flows of products and energy (Townsend 2013). Although this approach could be temporarily successful in issues such as traffic, its benefits are often exaggerated by companies that offer them without any consideration of the problems. Therefore, they are gradually being applied through the use of public money in more cities, despite the fact that their solutions and methods do not fit every local context. The method used in these management models is highly based on gathering Big Data through various city monitoring practices and performing in regard to the available data resources. This research specifically looks into the attributes of this decontextualized data gathering method.

Big Data has its own benefits. This research is not opposed to using Big Data to solve urban problems, but rather brings Big Data and Small Data together to investigate how they can be introduced into urban monitoring and data gathering practices. On one side, computer aided monitoring and urban observation techniques are growing and gather massive amounts of Big Data about the cities. On the other side our age's interest in knowing the city with Small Data -- gathered directly by humans -- is decreasing. Therefore, this research asks "what are the limits and advantages of human and computer aided site observation in understanding people's patterns of behavior in urban spaces?" In addition to a theoretical approach towards understanding these methods through a literature review, some of the precedents of both approaches for urban site observation are studied and compared with regard to their benefits and limits. With these aspects in mind, the researcher went outside to do site observation in a specific small urban space, University Station, in Buffalo. The observations are documented and analyzed through videos, animation, photographs, drawings, and short pieces of narration. The observations try to understand people's behavior in different scales and types. Then, they are categorized and compared to the previously studied methods. The main outcome of a small data gathering through site observation in University Station has been a detailed classification of the station's people and spaces with regard to their behavior, activities, relation to the station, and their kind of appearance in that particular space. This classification immediately suggests that there are many more details about citizens of a city than simply treating them as flows of similar objects.

But how can a mixed approach of human and computer aided site observation and monitoring of urban spaces, inform the city about its citizens? What kinds of data would citizens like to know about themselves? What is useful and what is not useful?

Rather than trying to design a monitoring platform which answers these questions and functions to gather data with a problem solving intention, this design research aims to design an observer platform which magnifies attributes of different kinds of data by juxtaposing them. The proposed platform is a part of the city's transportation system in University Station, which redefines the station's experience for its users by knowing more about them and having a personalized communication with them. The platform tries to classify people and the space itself into the categories achieved by observations, then builds more detailed unique personas for each user, benefiting from near real-time analysis of behaviors. These analyses are based on predefined interpretations of different human activities achieved by observations that are given to the platform. The communication between the "observer platform" and the user will happen through multiple objects including a ticket machine in University Station. Different stages of this process of interaction with the machine, including the final stage during which the ticket machine dispenses the printed ticket, reveal the data that the platform has already gathered about each particular citizen. This platform lets the citizens and the audience of the project speculate about plausible futures of their city in various aspects and considerations of the data that will be gathered about them.

Keywords: Smart City, Big Data, Small Data, Urban Space, Site Observation, University Station

2

This research started with joining specific social values with various technological concepts. The primary aim was to ask “in what ways will the future technologies in cities work for, or against, people?” Humans are going to be surrounded by artificial intelligence and big data in an exponential rate. How do these techniques affect all people in the context of cities and urban spaces?

Social Implications of Technological Developments in Cities

What do future cities have to offer to their people? What are they capable of taking from people? Technological development find their ways to societies. Advertisements of their creators increase their consumption. Increased demand seeks more technological development. There is already a strong focus on what they offer, though their offerings and their method of application can always be enhanced. The interest of this part is to look back at their negative social effects for different social groups of a society. An inherent contradiction exists in consumer oriented technological development. One needs to bear in mind that these kinds of technologies have never acted neutrally in treating different social groups equally in cities.

Various aspects of such social inequities, have been covered here. Today’s wealthier urban spaces are separated by highways from poorer zones. Firstly, CCTV security strategies keep away the homeless or the inappropriate from the giant multifunctional buildings that are replacements of the old public spaces (Stephan Graham 2001). These buildings, which have to serve the profit of their investors, are not meant to increase social sustainability, but rather segregate rich and poor more than before. While the poor hang out with the poor, this gap will exponentially increase (Stephan Graham 2001). Even airports and rail stations have included more leisure activities than serving passengers. Secondly, cars replicate the same story. Car owners stay in their comfort zone and receive information technologies embedded in their vehicle to stay away from pedestrians (Stephan Graham 2001). Thirdly, telecommunication providers tend to cherry-pick their most profitable costumers and parts of the city. That is the reason that Senator Bernie Sanders today opposes the merger of AT&T and Time Warner (Frej 2016). Their merger results in more central power and less service, on average. Finally, even internet is polarizing the world into the connected and the disconnected, two worlds of people: those who understand English, are younger on average, and have more income, and those who do not understand English, are older, and are from a lower class (Stephan Graham 2001).

An Intro to Computational City Management

With all of the aforementioned inequities in mind, it becomes clear that the future is not all bright. To have a better future, we need to understand the weaknesses of the imagined landscape of it. Today's city mayors are thirsty to make their cities smarter. What is the history of this smartness in cities? How has it functioned and been tested before? In 1972, the consultant and cybernetician, Stafford Beer, was taken to Chile to help Salvador Allende, the Marxist leader of Chile, run a new economic management system that would guarantee socialism (Morozov 2014). Allende wanted to shift companies' production toward social needs, while managing product pricing (Morozov 2014). The government planned to control the distribution of thirty goods, including flour, rice, and tea. Beer created a cybernetic system based on worker participation and reports, through the use of technologies that were not cutting-edge at the time, such as telex machines and slide projectors (Medina 2011). Cybersyn would have sent limited necessary data to the center of government's decision making. Shortly after the announcement of Cybercyn going public, critics judged the project as either a "Big Brother" tool or science fiction. Beer did his best to emphasize the fact that Cybersyn works with workers and for workers (Medina 2011). However, workers had minimal participation in the project and it was up to the decision makers how to use the project, which could have been a threat to the factory's autonomy. Cybersyn did not fully developed and never went public, so it is difficult to judge how it would have functioned in reality (Medina 2011). Beer did not have access to big data and today's equipment, such as powerful computers, sensory networks, smart phones, and big data in general. Nevertheless, he predicted, or perhaps started, today's models, which mainly follow the concept of a smart city.

While "smart city" is a concept that is growing rapidly, it is still not framed accurately. Anthony Townzend defines it as "places where information technology is wielded to address problems old and new." (Townsend 2013). At one side ubiquitous computing, Internet of Things, and methods of data gathering are growing as technical means, on the other side the DIY Culture, civic hackers and citizen scientists, media art projects, new privatized urban infrastructures such as Uber and Airbnb and of course the corporate model of smart city management, are growing around the world. Among these, the corporate model of "smart city" management is the most expensive and consumes more resources of public money in some cities. The impact of it could not be underestimated. "Smart city" management systems offered by big tech companies, have been strongly supported by many city managers. One of the most famous examples of smart city projects is IBM's Rio de Janeiro's management system. The promise of the city's control room, or similar projects by other companies such as Samsung, Cisco, and Intel, is efficiency, security and convenience for the city. The following sections look at their relevant concepts, approaches, and audience or participants, respectively.

Top Down Design Wave in Today's Smart Cities

On one side there are company names and on the other side there are goals and promises. In this section, it is argued that they both are problems of these approaches of becoming a "smart city". The primary problem with these corporate-lead projects, which benefit from today's state of ubiquitous computing, is the extensive privatization of public management and the fact that when a company is controlling the city, there is no guarantee of setting the best goals. Revenue is the dominant factor.

Simply changing the goals, initiators, and process of these black boxes of code and algorithms does not treat the issue in a better way. The fiction of automation has been fantasized enough in ubiquitous computing research. The excitement of access to big data and fast technological development does not solve all of the problems. The paper "Yesterday's tomorrows: notes on ubiquitous computing's dominant vision," by Genevieve Bell and Paul Dourish, helps to establish a better understanding of what the body of our research and practice needs, is not another version of Weiser's visions, but rather a version that understands technological conflicts, limits, and culture. The authors' statement clearly and properly destroys many hops when they state that "designing such seamless futures will be misleading and dangerous" (Paul Dourish 2007). Urban life, with all of its complexities and contingencies, could not be summarized in an engineered system and, if that is so, something is wrong. As William Mitchel writes, "our job is to design the future we want, not to predict its predetermined path" (Jill Conner 2004). By designing deterministic systems of city management, the future will never become brighter. Top down approaches of introducing the engineered black boxes of hardware and software as the solution to cities, disregards all the local attributes and contingencies and does not necessarily fit the context.

"Quantifying Everything" as Today's Popular Method of Developing Cities

Smart city initiatives around the world are optimizing transportation and moving towards more efficiency and sustainability. But beyond the concerns of privacy and ownership of data, there are other serious inherent problems. The danger is in framing the city as an aggregation of variables that could be optimized (Mattern 2015). In other words, risks are in presenting reducing the city into numbers. The architect, Rem Koolhaas, points out that the "traditional European values of liberty, equality, and fraternity have been replaced in the 21st century by comfort, security, and sustainability" (Koolhaas 2014). Traditional values cannot directly connect to available technical solutions. Values such as comfort are easier to be translated to efficiency which could be considered (not comprehensively) as an engineering question. When there are questions with supposedly available answers, it is more probable that they become the main questions and values.

Even quantitative metrics, like energy use, are not as simple as they seem to be. Sarah Bell points out that simply monitoring energy use with infrared cameras to track buildings' heat loss is not enough; we also have to consider cultural norms, such as dress codes that require men to wear suits in the hottest months of summer. (Bell 2012). While quantitative city management projects, such as Hudson Yard, claim to improve livability and quality of life, there are many unsolved questions, such as "what kind of quality they are able to increase?" (Mattern 2016).

Two bold data representative elements are growing in today's smart cities: City Dashboards and Control Rooms. City Dashboards offer a big-picture of what is happening in real time, usually in the form of a public website. They include data in areas such as education, health and wellness, employment, innovation, public safety, energy and environment, weather condition, financial health, traffic, and even social media trends. Many cities, including Edinburgh, Glasgow, London, Manchester, Boston, Portland, Michigan and many others have already started their dashboard portal. The info represented in dashboards appears under a simplified interface that targets a non-specialist audience (Mattern 2016). Their audience sometimes recognizes dashboards as objective data representatives. How is the data that they offer is gathered? What are the data resources? Different decisions about, and answers to, these two, results in a power structure and architecture behind dashboards that is often underestimated.

A part of this architecture comes from how we understand data. There is no such thing as raw data. Generated data is a result of "choices and constraints, shaped by a system of thought, models and methodologies, techniques and technical know-how, public and political opinion, ethical considerations, the regulatory environment, and funding and resourcing" (Kitchin and Lauriault 2014). Different devices and technologies capture different entities. They have their own settings, parameters, and calibration that directly affect the end-result. The classifications of data types, regulations, and considerations of privacy are also influential. Data might seem to be representative of a whole city, with all of its citizens, but questions of "who uses a space or media, who belongs there and who goes there," are often overlooked in dashboards (Boyd and Crawford 2011). Dashboards and control rooms are based on Big Data packages without accurate routes to where data is coming from. "Taken out of context, data loses meaning and value". Moreover, "Big Data" is not replaceable with Small Data. "Working with big data is still subjective, and what it quantifies does not necessarily have a closer claim on objective truth," despite the fact that most of the urban data reaches to its audience, whether citizens or decision makers, in a stage that is already cooked (Boyd and Crawford 2011). What happens to all of the small data that is available or could be gathered and studied? Big Data and Small Data each have their own implications and are not interchangeable. Interviews, surveys, and observation reveal qualities that cannot be found in Big Data packages.

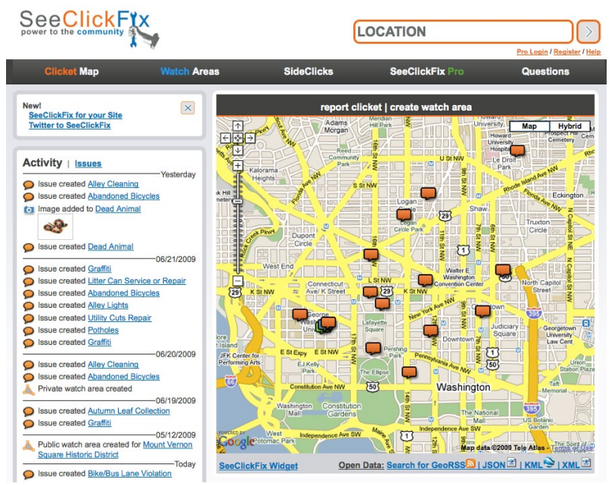
City control rooms have a similar approach to urban dashboards in presenting data. I.B.M., in its Operations Center in the City of Rio, classifies problems into four categories: events in the city, incidents, emergencies, and crises (Singer 2012). Aside from events that are organized before, all of the others are reports after they occur. I.B.M. expects its Smarter Planet unit, which includes the Smarter Cities business, to have a revenue of $10 billion by 2015 (Singer 2012). Spending all of this money on merely looking for problems without attempting, at the same scale, to find the reasons, is not a long term solution that works for all of the citizens. In such system, whatever is not operational or measurable is simply overlooked in the architecture behind these control rooms.

Understanding People's Behavior in Urban Spaces

Humans can control technology. In the case of cities, culture and people could be the keys; putting them in the right place results in the successful control of technology. Fortunately, there are attempts and projects to make smart cities through smart citizens. "Failure to put people at the center of our schemes for smart cities risks repeating the failed designs of the twentieth century" (Townsend 2013). However, the risk this time is higher because at the end of this century, 80 percent of the world population will live in cities (Townsend 2013).

This research aims to investigate Big Data and Small Data in urban space where people appear and can be studied and tested. People are direct representatives of their city and David Harvey argues that "what kind of a city we want cannot be divorced from the question of what kind of people we want to be" (Harvey 2012). To understand what kind of people we want to be, we need to know what kind of people we are, and what kinds of relations we have with each other and the space. Looking at peoples' presence and behavior in public space is an opportunity to understand what kind of detailed considerations are useful as a response to the stated problems. Classical public space is conceptualized as the 'space of appearance' for political action by Hannah Arendt (Arendt 2013). But who has the power to speak in public spaces and who is going to be more empowered or weakened?

Projects, such as seeClickFix, that allow people to report and track non-emergency issues anywhere in the world via the internet, have increased civic participation in cities (SeeClickFix 2016). This raises questions about who is contributing to the cities of the future and what are the considered scenarios for people who are not participating?



Jennifer Gabrys defines “idiots” in Program Earth as people who are “unable to participate in public life” (Gabrys 2016). In “Alien Staff,” an art project by Krzysztof Wodiczko, the instrument is a story telling platform for immigrants who are separated from society. A prerecorded video at the top, with a loudspeaker and some objects in the middle of handheld device, together help its operators (immigrants) to broadcast their stories of difficulties to the others (Wodiczko 1992). The project criticizes the situation of segregated people and their inability to communicate with others.

In addition to concerns about customers of civic participation, “the form of using participatory media practices are already tools of variously restricted political engagement” (Gabrys 2016). The consideration of citizens as data-nodes, where data gathers by them, or transfers from them to the cloud, already defines a very restricted role for citizens. While using citizens as technical resources is useful, we also need to look at small data that is already there about citizens or gathered from them. “Unseen (SEEN-Fruits of your labor),” a project by Omar Khan and Osman Khan, challenges the method of communication between different social groups. The project reveals and broadcasts a message from members of three communities in San Jose’s labor scene--Silicon Valley’s tech workers, undocumented service workers, and outsourced call center workers, to the general public who are looking at their installation in the public plaza (Khan 2006). The project changes the usual social interaction happening in a public space when people use their phones to see the messages on the installation that are not readable by naked eyes and then shows these messages to strangers. The artists get the information about a specific group of people using Small Data gathering methods and transfer that data to each other. These kinds of Small Data collections, with connections to their resources and methods, are not available in city dashboards.

How can the social activities in urban spaces that are hard to count be studied? The opportunities afforded by Big Data are great but the danger is that one misses other opportunities. Kate Crawford writes that in “adding humanistic methods with analytics we can ask people the ‘why’ and the ‘how’ not just the ‘how many’ (Mattern 2015)”. This research pursues a mixed approach, bringing Big Data and Small Data of urban spaces together. The details of this process have been described in the next section.

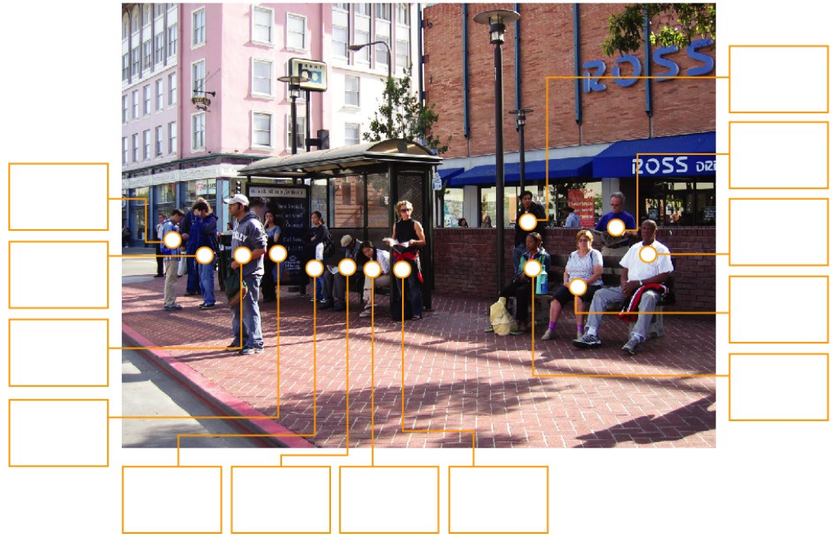
3

Urban Observation Precedents

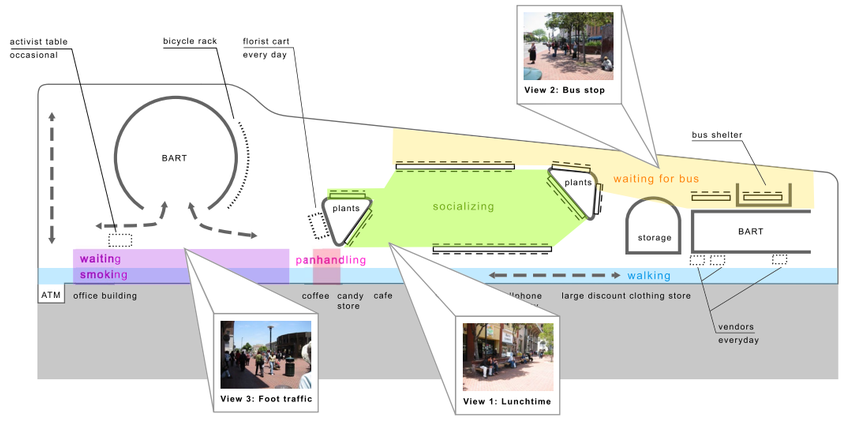
On one side computer aided monitoring and urban observation techniques are growing and gather massive amounts of Big Data about the cities. On the other side, our age's interest in knowing cities through Small Data gathered directly by humans is decreasing. To bring these two methods together, precedents of both computer and human aided site observation techniques are studied here.

Familiar Stranger

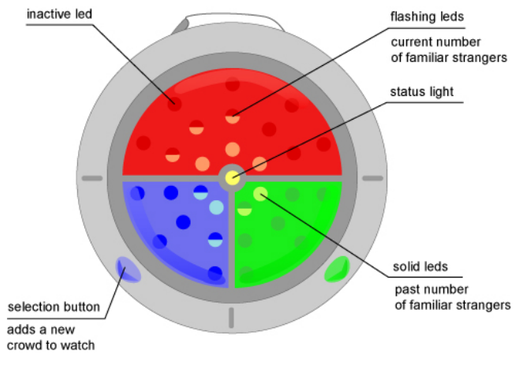
Familiar Stranger, a research project by Eric Paulos and Elizabeth Godman in 2002, used close site observation to investigate an urban social issue which eventually resulted in designing a communicative device. It is based on the fact that "it is the people with whom we share urban spaces who dominate our perception of place and among those people the individuals who affect us are ones that we repeatedly observe and yet do not directly interact with – our Familiar Strangers" (Paulos and Goodman 2004). Their project seeks to evaluate the state of relationships with familiar strangers in urban spaces at the time of the project in Berkeley Plaza. They followed the same method of Milgram's original study of familiar strangers in 1972. They photographed people in their focused areas and returned a week later at the same time of the day to distribute the photos and asked participants to know if they recognize the people in the photos (Paulos and Goodman 2004). The notion of familiar stranger helps the current research to design for individuals who repeatedly visit an urban space at the same time of the day.



Constitution Plaza



Their research also uses surveys and interviews to pursue a participatory design method for the final communication device, which shows how many other familiar strangers are nearby. The device emits a short range (20m) radio beacon with a random but unique identifier. The wireless transceiver on the device allows each to be able to detect and record all of the other nearby beaconing devices. As two people approach one another, each device detects and records the others unique ID (Paulos and Goodman 2004). This method will be proposed later in this research along with a camera as a method for identifying people.

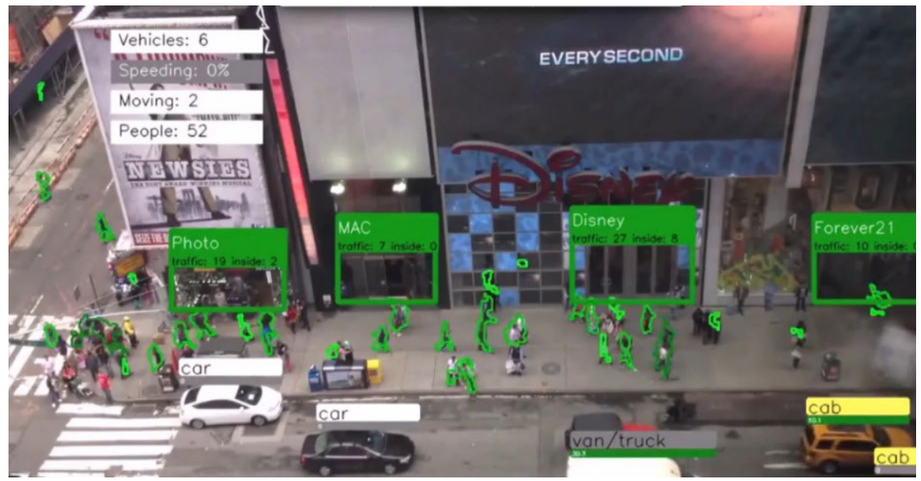


Paulos and Goodman conceived four quantifiable factors that affect social comfort in urban public spaces:

> *Amount: How many familiar people are around?*
> *History: How familiar are these people?*
> *Turf: Have familiar people visited this place in the past? Is this "my kind of place?*
> *Tribe: Do the people currently here visit the same places I do? Are they "my kind of people"?*
>
> *(Paulos and Goodman 2004)*

Their argument shows that this subjective information, which has been achieved through site observation, survey, and interview as small data gathering methods, is a crucial factor in understanding urban spaces. This type of data could not be achieved through today's automated urban observation systems, which will be discussed later.

Placemeter



Placemeter is a video analysis company with a focus on urban spaces. It allows its users to use either Placemeter software alone for analyzing captured videos or for live analysis of videos captured by the Placemeter sensor. The sensor is a camera that is appropriate for being installed outside. It sends data analysis of the video stream to the Placemeter server without storing video files. The software, trained with Machine Learning algorithms, classifies objects into five groups: pedestrians, bicycles, motorcycles, vehicles, and large vehicles (Placemeter 2016). The interface allows users to have access to the number of classified objects that enter or exit from an area, pass a line in either direction, or enter a door.

Placemeter and similar software systems provide real time accurate data of an unlimited number of objects. Their accuracy and real time features could not be achieved by humans, though they are very limited in distinguishing differences.

Social Life of Small Urban Spaces

This research project by William H. Whyte and in his team in 1980, was committed to urban observation in small urban spaces in different cities to understand “why some city spaces work for people and some do not and what the practical lessons might be” (Whyte 1980).

Their high quality observations revealed valuable answers to their question that, while simple to understand, were previously undocumented. Whyte mentions in their time-consuming method of observation that fast paced video and still images with the speed of one frame per second, does not save time permanently. They needed to go back to videos and play the same scene for many times to interrogate different aspects of the video. As an example, White asks if “the people walking on the left, instead of the right, mostly women? Or men? What happens when they walk abreast?” (Whyte 1980). The detail and quality of Whyte’s observations, compared to Placemeter, shows how many details could be studied in urban spaces that automated systems can easily miss, though their process is highly time-consuming and restricted in updating itself.
time consuming and restricted in updating itself.

Their observations look at how people are using the space, relative to specific environmental conditions, such as light, sun, weather, wind, trees, and water. They also look at activities and social interactions, such as where people say goodbye, the distribution of male to female, how long a conversation lasts, and how fast are people walking.

In their analysis of the actors in the urban space, they describe characters such as:

Upper-income
Older people
Couples
Office workers
Playing kid
Shoeshine man
Hardhats who drink beer
Tourists
Pot smokers
Lovers
Girl Watchers
Undesirable
Woman with shopping bags
Street band
Entertainers

(Whyte 1980)

The observation results in the next section show how each observation in different urban spaces might affect such classifications of repeatedly seen characters, with all of their specific characteristics.

Site: University Station

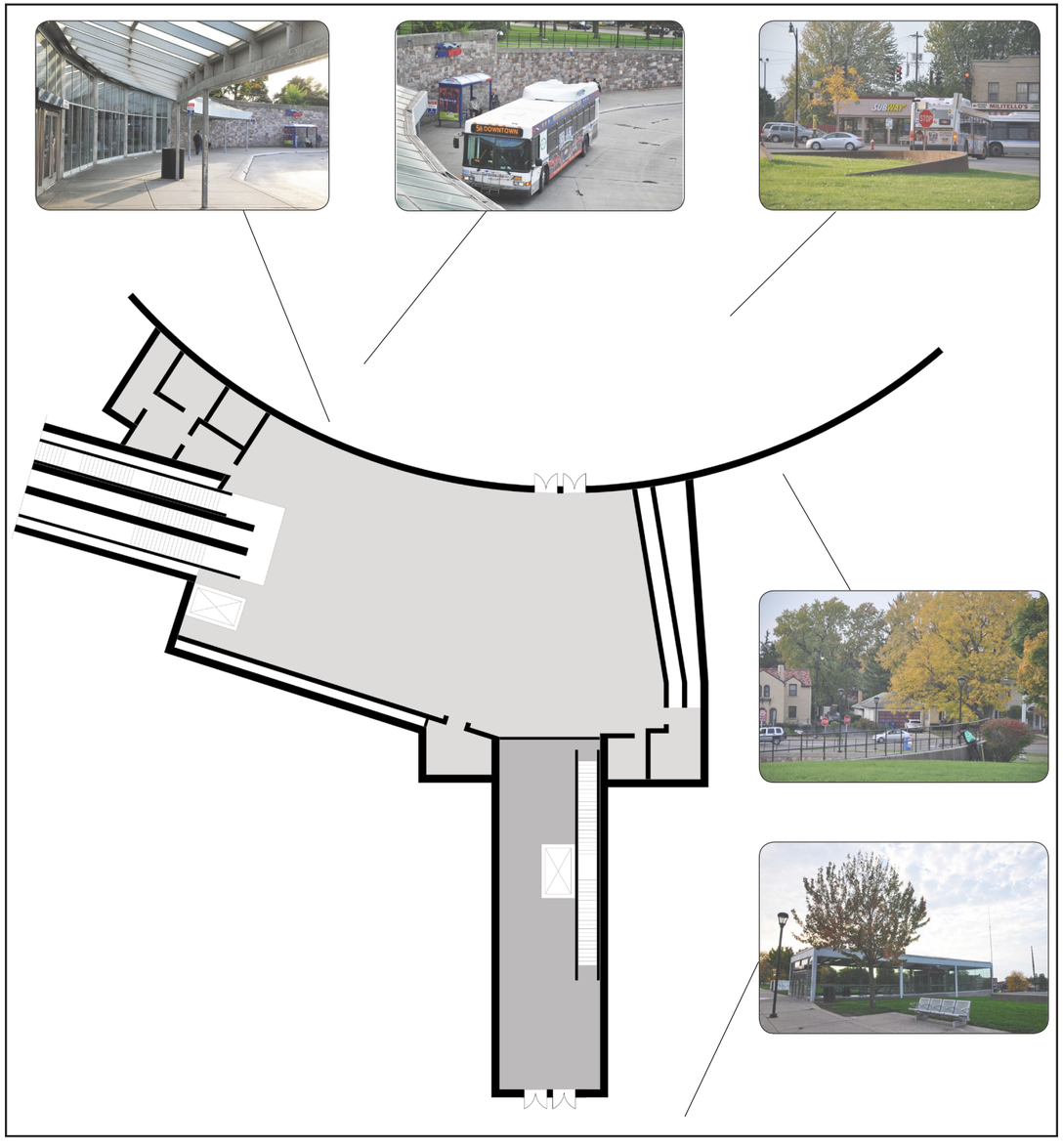
Based on the need to pursue a humanistic approach and fieldwork in this research, University Station, located on Main Street in Buffalo was selected as a site for urban observation. University Station is one end of the only train route of the city and a key bus station in Buffalo. Since public transportation in Buffalo is not very well developed, it is not the primary preferred mode of transportation for most people. However it still has one of the most diverse populations of the city amongst its small urban spaces. The station, located next to the University at Buffalo, at one side is a hub for university staff and students and on the other side gathers people of different generations and social groups from various spots of the city. Architecturally, three different levels of the space sometimes gather people and in some cases divide them without leaving any chance of forming a connection. Its two entrances have different characteristics, one being on the upper level, facing the university and the other at the ground level, facing bus stops and Main Street. The underground is dedicated to the train.

Artwork: Neon for South Campus Station (Currently inactive)
Artist: Stephen Antonakos, 1979

Lower Level, Bus Stops

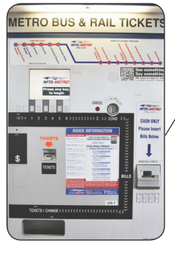
Upper Level Acces

Exterior Spaces of the Station



Interior Spaces of the Station

University Station is not a crowded station, compared to the image that comes to mind of the big stations in larger cities. Its physical status indicates how at least some aspects of it have not been important for the city managers. Different dysfunctional elements of the station have not been fixed for long time.

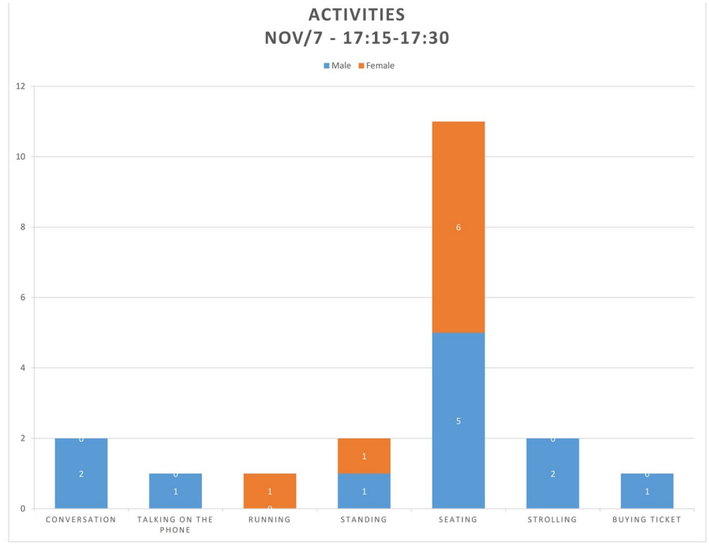


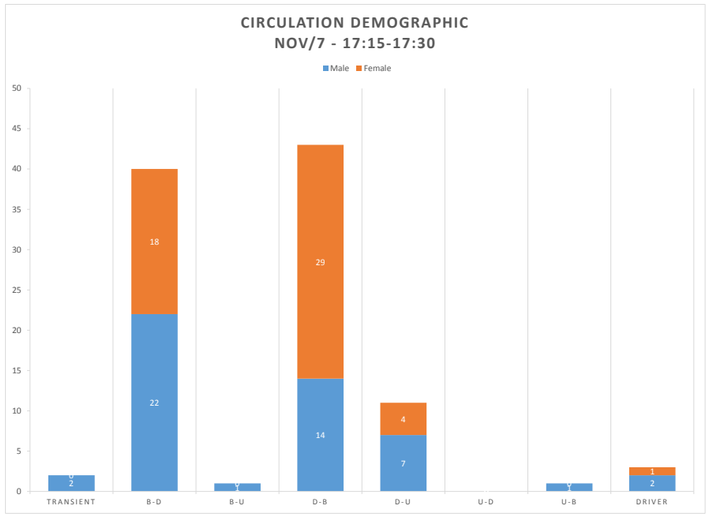
Site Observation

“If a place can be defined as relational, historical and concerned with identity, then a space which cannot be defined as relational, or historical, or concerned with identity will be a non-place” (Augé 1995). University Station is a relatively small station that has few features of a place, as opposed to a non-place. It is not an absolute non-place, but in many aspects could be considered as a non-place. It has sequences of events, repetitive patterns of activities, and instructions embedded in the spaces. In can be measured in units of time. All of the aforementioned attributes have been considered in the observations. Some questions about the users of University Station that arose thorough out the course of field work and observation are as follows:

Who are the actors?
What are their behavior patterns?
At what time do they appear and disappear?
How do they circulation in space?
What kind of objects do they have?
What are their activities?
What do they do there?
What are their mobility patterns?
Where is their destination?
What is their transportation vehicle?
What kinds of social interactions are happening there?
…

To answer such questions, note taking, photography, video recording, and sketching on site were used for documenting the results of the observations. Additionally, informal and unstructured interviews were used as a complimentary method for observation. The information in the video has been imported into prepared tables. The tables provided the necessary information for producing vertical charts. Then, analysis of this information helped to prepare the attached diagrams of the relationship between people and space. The tables include various kinds of information, including external contingencies that affect people’s appearance and activities in the station, such as weather conditions, the time of day, activities which are not detectable by today’s automatic or digital monitoring systems, and the path that users take in the station and additional comments.



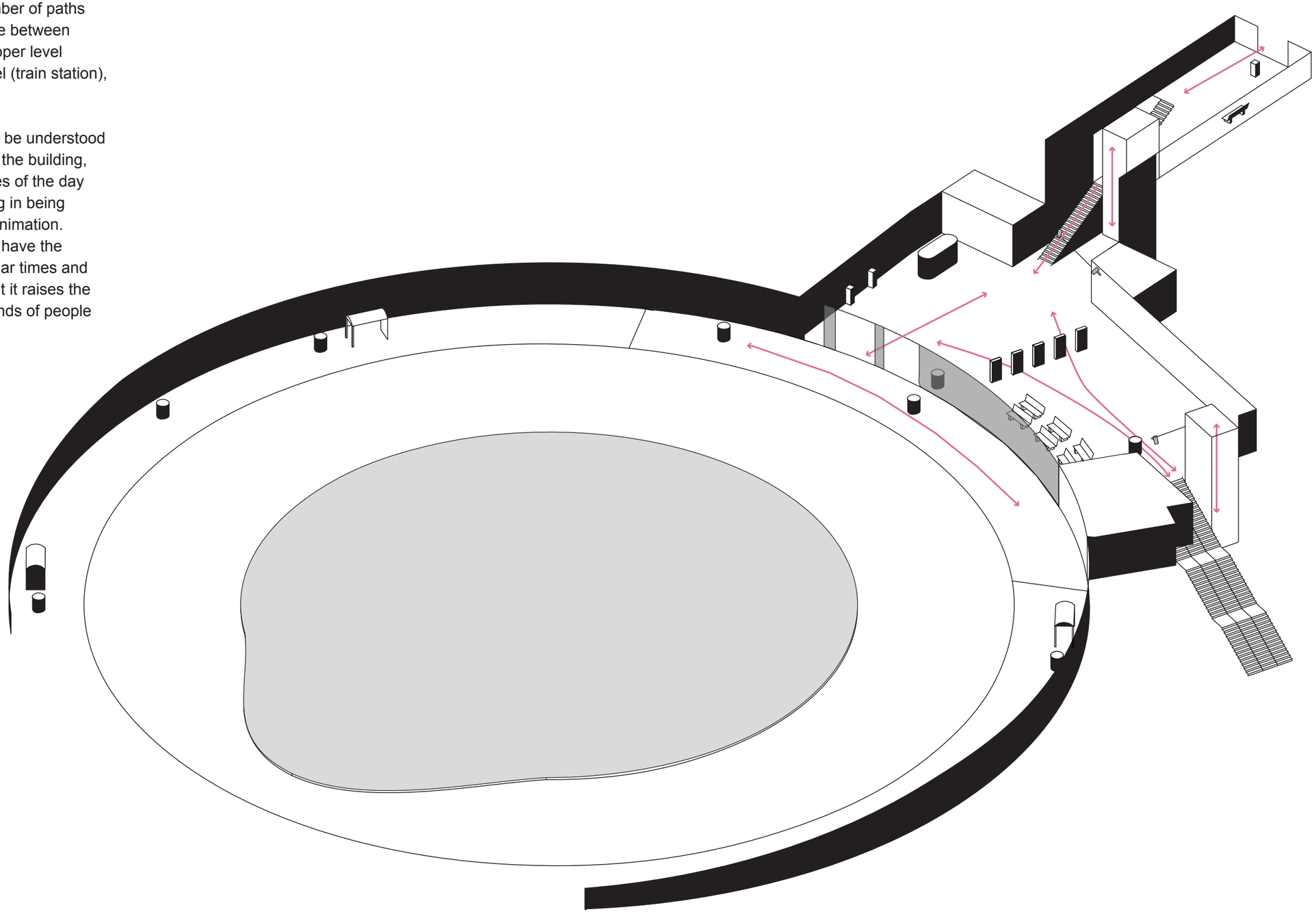


No.	Setting			User					Activity											Other
	Day	Temp /weather	Time	Age	Gender	Race	User Type	Destination	Live Conversation	Talking on the phone	Walking	Standing	Running	Seating	Texting	Smoking	Waiting	Eating	Buying Ticket	Comment

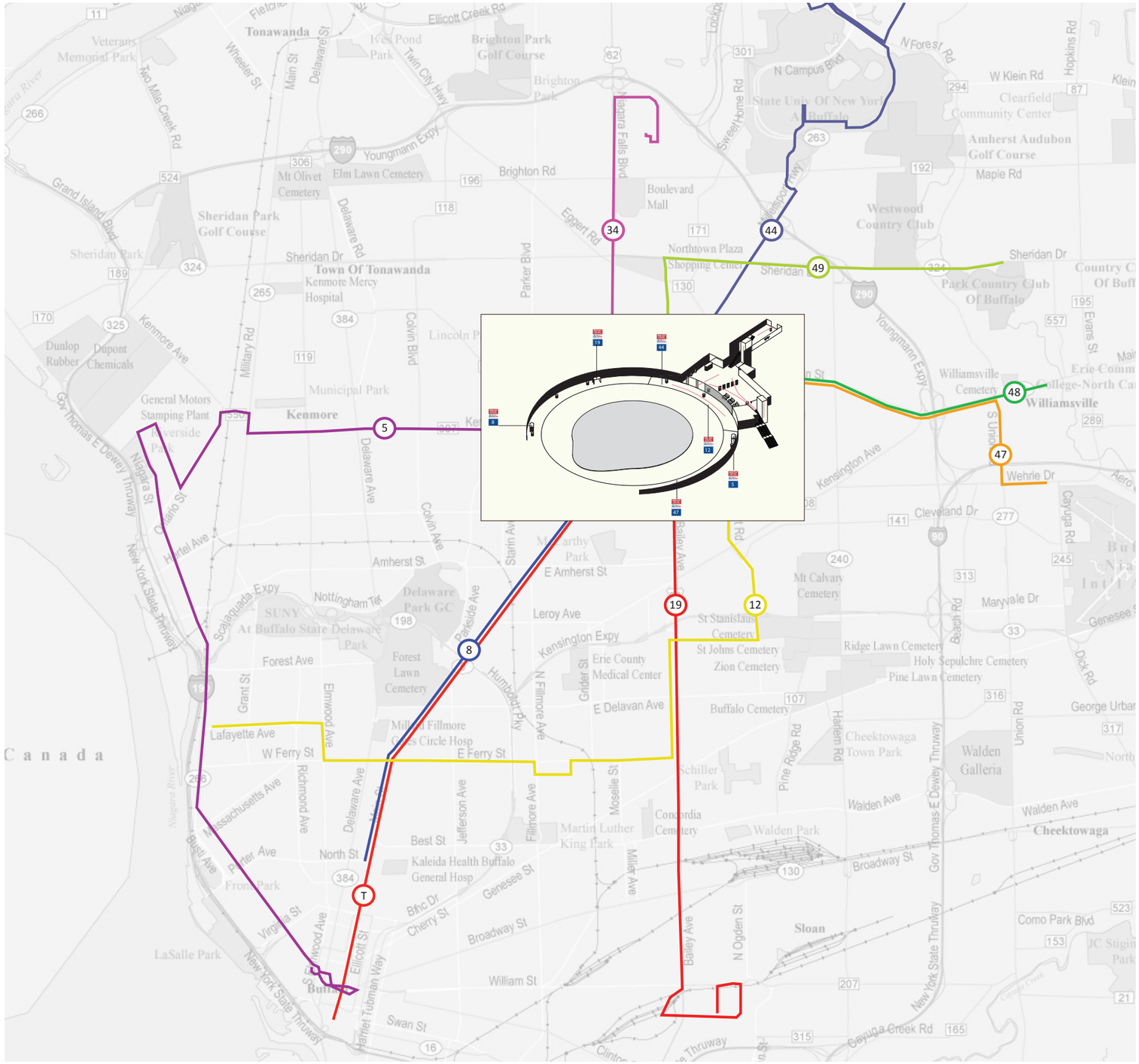
Main Circulation Paths

One of the spatial diagrams and outcomes of data tables is the circulation diagram. There is a limited number of paths taken by users. These paths are between the lower level entrance/exit, upper level entrance/exit, underground level (train station), elevators. and bus stops.

While these paths could be understood according to the architecture of the building, their usage during different times of the day has been studied here, resulting in being documented in the form of an animation. Interestingly, many people who have the same circulation pattern in similar times and durations are similar people, but it raises the question as to who and what kinds of people are they?



Public Access to University Station



Based on the observations, the circulation paths are related to destinations and origins. For example, of a group of 20 students who leave the train to take the bus, 15 of them take the same bus. However, analyzing these connections is beyond the ability of human observer and could be analyzed by automatic counting of people who take a bus and connecting this data to their origin or previous circulation pattern in the space.

Actors

It was discussed previously that people who appear in the station with the same behavior (including mobility patterns introduced in the last section) at the same times, have similar characteristics. During the observations, some of these characters were drawn. Drawing faceless characters was selected as a method of documentation as opposed to photography, since it can emphasize on details but does not introduce a unique individual. However, the descriptions of these characters are unique in order to help the production of a more general description for each group of characters in the future. These groups of characters are, in fact, a new classification of people, moving beyond the merely automated camera detection of objects in a way that does not distinguish people from each other.

She looks relax but doesn't sit, finally sits and then stands again. Waits a long time for a bus.

The kid is the only source of human noise at noon. He plays around and gets excited when sees other kids.

Runs upstairs with 20 other fans. The come like a wave, noisy, happy, with friends and family. Uses station to go drinking in the weekend.

Gets bus and train with other friends to go home from school. But travels alone in the evening. Plays with his smart phone all the time.

He is curious. Cannot avoid asking questions, presents his drugs. He has a small backpack, asks change from everyone and he is successful when he asks from people who are buying ticket. Smokes inside, says that people are selfish, he needs to smoke but NFTA prefers him to catch a cold, while they can make a smoking area. He is smart but not completely conscious. Has two characters, sees devil and is afraid. Escapes from shelters but he is worried of people stilling his sneakers at night where he sleeps. Other transients pass and say hi to him.

Individual Classification

Fan

Long Time Sitter

Religous Volunteer

Police

Transient, Showman

Transient who gathers plastic bottles

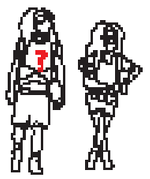
Old Wemon with Cart

Pot Smoker

Mom with her Kid

transient, Drug Dealler

Middle class employee in Downtown



The Station's first Time Vistiro

High School Student

? Bus Driver

? University Student

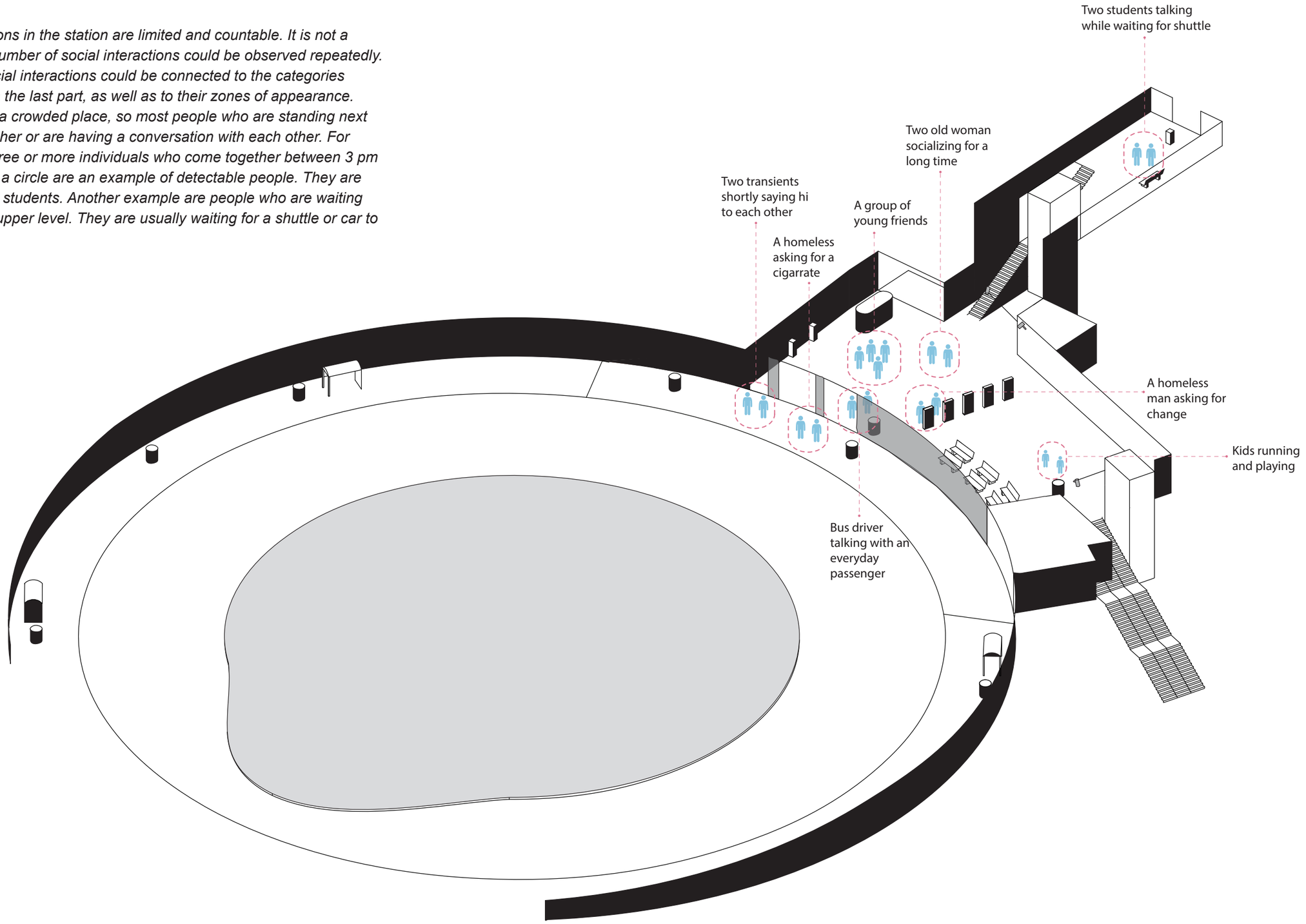
? University Staff

? Event Goer

This classification does not attempt to cover all individuals who appear in the station, but rather becomes a representation of the most repetitive individuals who are easily detected by their behavior in the space. Their behavior here is considered as a combination of their origins, destinations, circulations in the space, types of social interaction, interactions with objects inside the station, the zones that they use in the space, and the times of the day during which they appear.

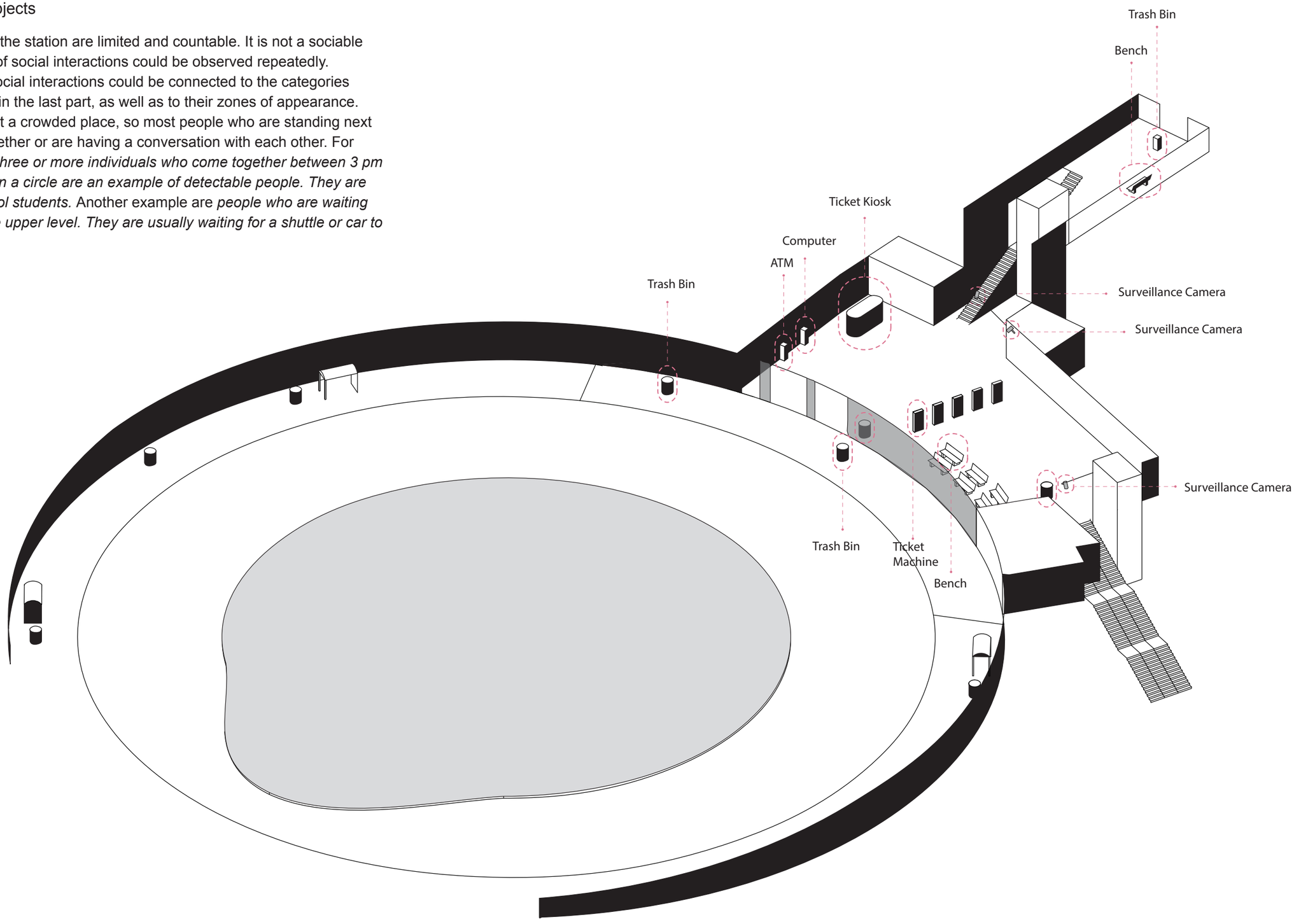
Social Interactions

Social interactions in the station are limited and countable. It is not a sociable place, but a number of social interactions could be observed repeatedly. Interestingly, these social interactions could be connected to the categories of people introduced in the last part, as well as to their zones of appearance. The station is also not a crowded place, so most people who are standing next to each other are together or are having a conversation with each other. For example, a group of three or more individuals who come together between 3 pm and 6 pm and stand in a circle are an example of detectable people. They are most likely high school students. Another example are people who are waiting with each other in the upper level. They are usually waiting for a shuttle or car to pick them up.



Interactions with Objects

Social interactions in the station are limited and countable. It is not a sociable place, but a number of social interactions could be observed repeatedly. Interestingly, these social interactions could be connected to the categories of people introduced in the last part, as well as to their zones of appearance. The station is also not a crowded place, so most people who are standing next to each other are together or are having a conversation with each other. For example, *a group of three or more individuals who come together between 3 pm and 6 pm and stand in a circle are an example of detectable people. They are most likely high school students.* Another example are *people who are waiting with each other in the upper level. They are usually waiting for a shuttle or car to pick them up.*

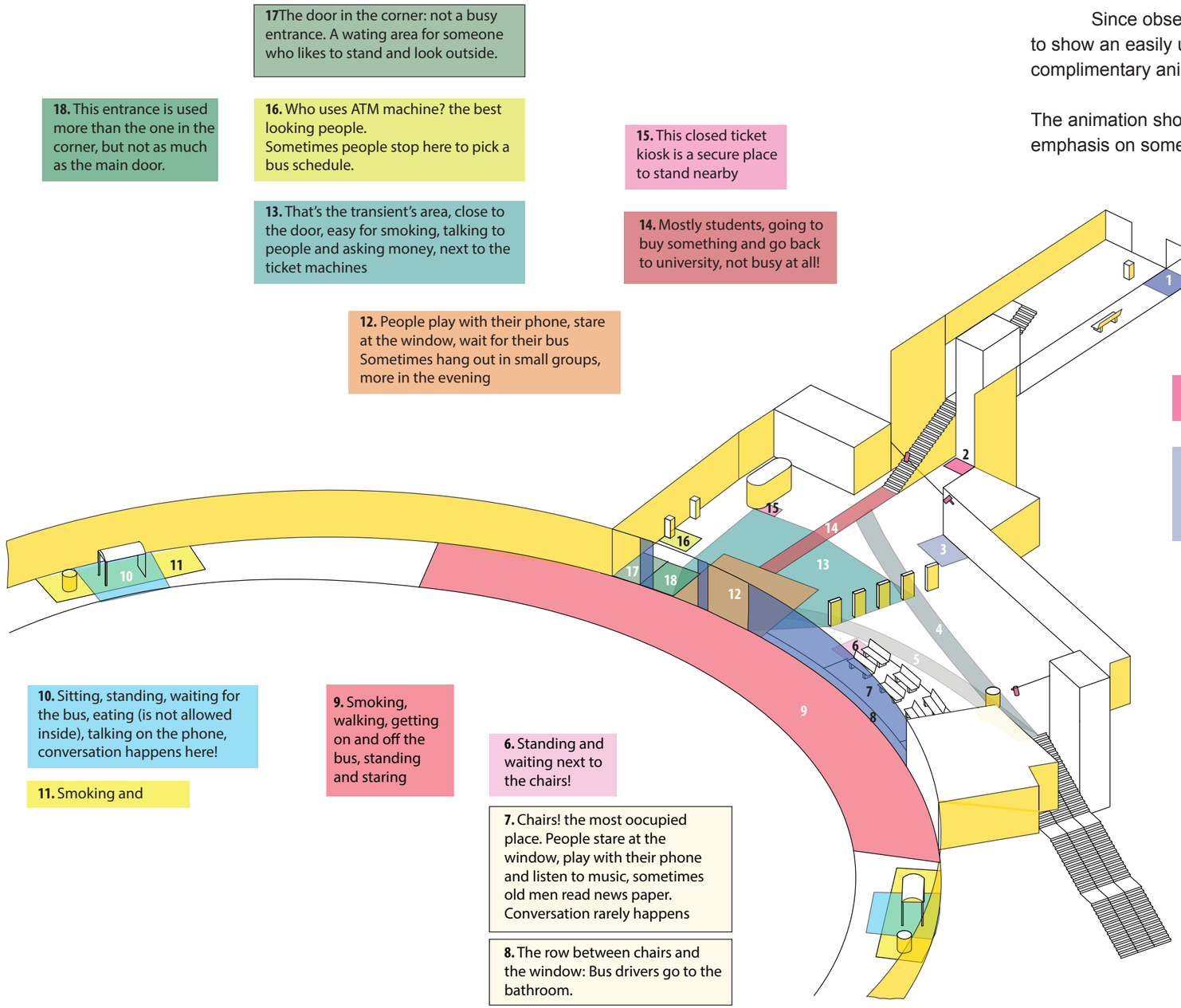


Zones, Time, Activities

The different zones of the station have been repeatedly referenced. Here, the zoning of activities and people shows what types of people and activities could be expected to be seen in different parts of the station.

Since observation and activities in the station are time based, it was impossible to show an easily understandable image of the station of a full day. Therefore, a complimentary animation can be found at:

The animation shows the mobility patterns during different times of the day, with emphasis on some specific characters.



17The door in the corner: not a busy entrance. A wating area for someone who likes to stand and look outside.

18. This entrance is used more than the one in the corner, but not as much as the main door.

16. Who uses ATM machine? the best looking people.
Sometimes people stop here to pick a bus schedule.

15. This closed ticket kiosk is a secure place to stand nearby

13. That's the transient's area, close to the door, easy for smoking, talking to people and asking money, next to the ticket machines

14. Mostly students, going to buy something and go back to university, not busy at all!

12. People play with their phone, stare at the window, wait for their bus
Sometimes hang out in small groups, more in the evening

1. Studdents wait for shuttle or a car

2. People wait for the elevator, happens once in a while!

3. Religous Volunteers, sit there from 7am to 5pm, sometimes walk around their stand to catch people

4. Again not busy!
From university to train: Students, this path is for people who usually buy ticket.
From train to university: Think about events, after hockey game, fans come back to pick up their car from "park and ride", that's an injection of white people.

5. Busiest path! All kinds of people, in the morning and afternoon: full of school students in groups

10. Sitting, standing, waiting for the bus, eating (is not allowed inside), talking on the phone, conversation happens here!

11. Smoking and

9. Smoking, walking, getting on and off the bus, standing and staring

6. Standing and waiting next to the chairs!

7. Chairs! the most oocupied place. People stare at the window, play with their phone and listen to music, sometimes old men read news paper. Conversation rarely happens

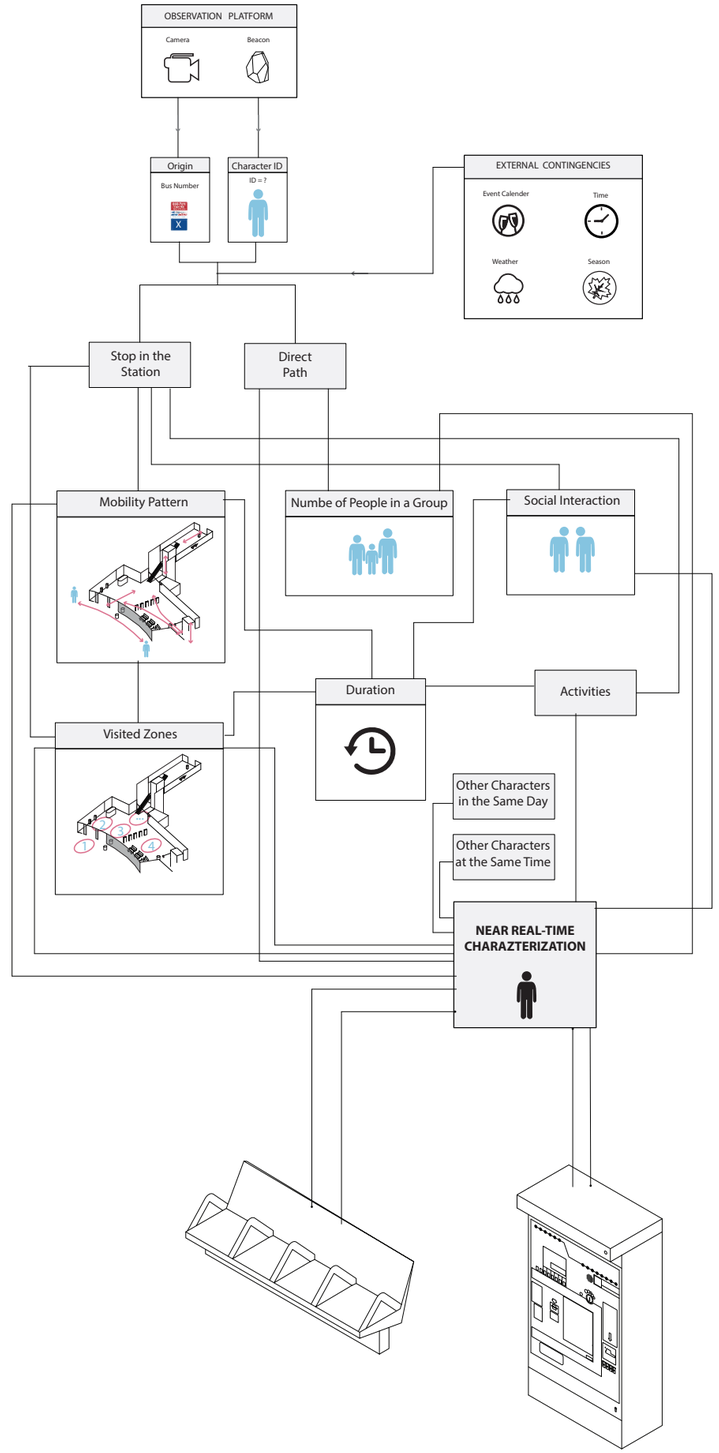
8. The row between chairs and the window: Bus drivers go to the bathroom.

Observation Platform

How can a mixed approach of human and computer aided site observation and monitoring of urban spaces inform the city about its citizens? What kinds of data would citizens like to be known about themselves? What is useful and what is not useful? Rather than trying to design a monitoring platform which answers these questions and functions to gather data with a problem solving intention, this design research aims to design an observer platform which magnifies attributes of different kinds of data by juxtaposing them. The proposed platform is a part of the city's transportation system in University Station that redefines the station's experience for its users by knowing more about them and having personalized communication with them. The platform tries to classify people and the space into the categories achieved by observations, then builds more detailed unique personas for each user benefiting from near real-time analysis of behaviors. These analyses are based on predefined interpretations of different human activities achieved by observations that are given to the platform. The communication between the "observer platform" and the user will happen through multiple objects, including a ticket machine in University Station. Different stages of this process of interaction with the machine, including the final stage of the ticket machine, the printed ticket, reveal the data that the platform has already gathered about each particular citizen. This platform lets the citizens and the audience of the project speculate about plausible futures of their city, in consideration of the data that will be gathered about them.

This platform, which will be designed in detail in the next steps, is exists both for understanding people's behavior in the station, as well as to transfer this information to the interactive objects that will be designed for the station. This platform uses factors that have one or more of these features that can:

1. lead to the detection of the users,
2. help to make a more detailed profile of a user
3. help to understand the situation and improve the quality of communications with the user.



Design Fiction as the Method of Intervention in the Station

The paper, “Resistance is futile” (Paul Dourish 2014) suggests looking at the future of Ubicomp in a different way. Authors analyze the role of science fiction movies on culture to understand how they have, in fact, enriched science. Their case studies on sci-fi movies are different from Weiser’s point of view because of their cultural elements, which show that failures or victories are based on the intersection of future technologies and culture (Paul Dourish 2014). A recently produced series, Black Mirror, is a similar example to “Resistance is futile” in challenging social implications of technology, wherein the work criticizes today’s technological flows and tendencies by presenting believable dystopias of the near future. Julian Bleecker introduces design fiction as an unlimited method to convey ideas outside of the boundaries of science and engineering (Bleecker 2009). The author argues that fact and fiction are not separable, since today’s fiction supports the production of tomorrow’s fact. The proposal of this research is to use the irony of Big Data and Small Data by gathering them together in an observation platform and presenting them back to the citizens through interactive objects in the station. Anthony Dunne and Fiuna Rabby write “we believe that by speculating more, at all levels of society, and exploring alternative scenarios, reality will become more malleable and, although the future cannot be predicted, we can help set in place today factors that will increase the probability of more desirable futures happening” (Dunne and Raby 2013). This method of using fiction is concerned with the social implications of the future technologies. The fiction probes could be working or non-working prototypes but the fictional aspect does not mean that they are impossible. Dunne and Rabby describe this type of critical design (B) instead of affirmative design (A) by defining duets of (A) and (B) such as: problem solving vs. problem finding, providing answers vs. asking questions, design for production vs. design for debate, design as a solution vs. design as a medium, fictional functions vs. functional fictions, science fiction vs. social fiction, futures vs. parallel worlds, the “real” real vs. the “unreal” real, applications vs. implications, and innovation vs. provocation (Dunne and Raby 2013). In the next part, designing the interaction of the objects in the station with people, these (B) characteristics will be followed. The final implication is to engage the public with an urban computing issue that has important social consequences.

4

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