Eda Louise Brasileño-Hatanpää

REALISTIC SUPER MARIO:

Reimagining the Life and Times of Mario Rossi in 1980s New York City

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Abstract

This study presents Super Mario Bros. for analysis to demonstrate the effects of reality-based storytelling on a classic platformer. It experiments with the effects of a modified game environment on aesthetics and playability when introduced into an otherwise straightforward and familiar game with recognized and established gameplay and mechanics.

Research methodology consisted of qualitative research, including applied visual, historical and ethnographic research. Visual or image-based research included screenshots, lifestyle observation through analysis of photos from 1980s New York, and artistic styles prevalent in that era, including street art.

The aim of this thesis is to reimagine Super Mario as a character and retell his story, bridging the game with real life by referencing actual historical events. This thesis also consists of an experiment in achieving results by utilizing tools and techniques that could save a significant amount of time in production, therefore building a game environment through rapid prototyping using inexpensive or free resources where applicable.

This project demonstrates one option for transforming an established game and narrative in a side-scrolling game platform with straight-forward gameplay to a more sophisticated 3D environment that accurately reflects historical, architectural and geographical information in an approximated version of the real world.

Keywords

Super Mario Bros., platformer, game analysis, game design, game environment, level design, narrative game, storytelling, real-world, 3D, rapid prototyping, low-poly, worldbuilding, behavioral studies, cultural and historical background, Italian Americans

CONTENTS

LIST OF TERMS

3D modeling   The use of a software to create a three-dimensional virtual model.

3D Ripper DX   A utility that captures 3D scenes and objects including geometry, textures and shaders, and exports them into 3ds Max or Maya.

3ds Max   A 3D modeling, animation and rendering software from Autodesk used to create worlds in games and scenes for design visualization.

Famicom   Short for Family Computer Disk System, a home video game console developed and manufactured by Nintendo in 1983.

Google Earth   An application that represents the earth as a 3D virtual globe. It can access satellite and aerial imagery and other geographical information.

Low-poly   in 3D computer graphics, is a polygon mesh that has a small number of polygons.

Narrative game   A story and plot-driven game.

NES   Nintendo Entertainment System

Photo manipulation Altering photographs using an image editing tool such as Adobe Photoshop.

Platform game   or Platformer is a video game where a character runs, jumps or climbs between platforms.

Rapid prototyping   In game production, a technique used to quickly produce a mock-up.

Rotoscoping   An animation technique that produces realistic action by tracing over motion picture footage frame by frame.

Side-scroller   or side-scrolling game is a type of video game where action is viewed from a side-view camera angle. The characters commonly move from left to right.

1   INTRODUCTION

In this era of rapid development in computer technology, virtual reality (VR) and augmented reality (AR) are becoming mainstream and the trend of gamification is on the rise. These trends are on clear display in *Pokémon GO,* launched in the summer of 2016*.* The AR game caught the attention of millions of mobile gamers and instantly grew into a global phenomenon. One of its most interesting and novel features is the player's ability to catch virtual *pocket monsters* in "real life". Days after its release, it spawned a viral hoax in the gaming world in the form of *Mario Kart GO*, where the originator claimed that players could race with virtual go-karts. The author began to consider how the technology or gameplay of a product such as Pokémon GO, launched in the summer of 2016, could be utilized in other respects than in gaming or entertainment.

Inspiration struck while thinking of possible ways the Pokémon GO game or its technology could be repurposed to educate: could a product based on this technology be used to educate players about subjects such as physics, history or social anthropology? Coincidentally, the author had been thinking of making a study of one of the *Mario* video game franchise, as these are her favorite games. What would the game look like if it were in set in real life or an approximated virtual world? How would it be represented without being very literal and hyper-realistic, and how would the characters and other game elements behave and interact in the real world?

The game selected as the basis for re-interpretation was Super Mario Bros. published by Nintendo and first released on September 13, 1985. A portion of this study is dedicated to the analysis of the original game, its mechanics, plot, characters, visual style and key elements, in order to ascertain the required elements for building a real-world alternative. All the game's sequels, including the remake in the Super Mario All-Stars collection and retroactive continuity will not be further discussed or examined in this paper.

The author's original concept was to take the classic side-scrolling platform game and convert it into a form that complied with real-world physics while utilizing her previously acquired knowledge of architectural design principles.

Fundamentally, the concept was to create an experiential learning platform where players could re-evaluate the logic and dynamics of real world versus previously experienced game world physics. However, due to time constraints and limited resources, the author decided to narrow the scope of the inquiry and adaptation. The author took an example game and created a blueprint in terms of aesthetics and storyline that corresponded with a real-world situation. The educational aspect of the project became the primary focus. The ultimate goal was a game that presented an accurate reflection of the history and socio-demographic characteristics of 1980s New York which could be explored during the course of gameplay while also teaching investigative techniques and deductive reasoning.

The objectives of this thesis were to recreate a game for the purpose of education that accurately reflects historical, architectural and geographical information. For this purpose the original storyline was re-imagined within a specific historical context and a prototype environment conforming to the architectural and historical aesthetic of the period was implemented. The thesis required knowledge of the following fields: game design, level design, world building, storytelling and narrative design within a historical context. Research methods employed were qualitative, including Artifact analysis (examination of material, aesthetic and interactive qualities of objects in order to understand their physical, social and cultural contexts) (Martin, Hanington 2012a); Content Analysis (systematic description of form and content of written, spoken, visual materials expressed in themes, patterns and counted occurrences of words, phrases, images or concepts). (Martin, Hanington 2012b)

Re-envisioning of the Super Mario Bros. storyline was framed within the historical context of 1980's New York. The narrative design portion of this thesis focused on investigating the history of the Italian American community in New York, the dealings of the Mafia, crime and corruption, and the work of crime-fighters namely the NYPD (New York Police Department) and the Guardian Angels, an organization of unarmed crime-prevention patrollers. Explicit informal language was used in the narrative to support the first person voice and perspective of the main character.

Disclaimer:

This is purely a work of fiction. All names, characters, events and places are products of the author's imagination. Any similarity to actual persons, living or dead, or actual events is completely coincidental.

Additional to the narrative aspect of this study was the development of a methodology to rapidly prototype the city of New York. To this aim, data was extracted from Google Earth and imported into a 3D modeling software as the basis for rapid model building. The project utilized technology that saves a significant amount of time and labor and uses inexpensive and/or free resources to the extent possible (e.g., software and assets). Furthermore, this approach would provide game developers who have ample knowledge of photo-editing software with guidelines on how to create their own environment graphics and art with minimal artistic skills. Small companies, individual game developers, freelancers, as well as students who wish to continue this research may benefit from the methods discussed in this project.

The outcomes of this study in the form of narrative design and rapid environment prototyping have been carried out independently by the author, however there is also a companion study based on the same project in the form of the thesis of Emmi Rukkila, whose research focuses on the development of character design.

2   RESEARCH QUESTIONS

- What is the significance of storytelling? Is it crucial to the project?
- How does the game Super Mario relate to real life?
- Will a realistic game environment affect the way we play classic platformers significantly? Will it prove more challenging and tedious to play, will it be too distracting, or will it add to the excitement?
- Will the focus be more on the aesthetic detail of the game, the game mechanics, or the physics and other technical aspects?
- What level of photorealism is to be achieved? What are the means to achieve it?
- Will a playable game be made out of this research?

3   HISTORICAL CONTENT

3.1   A Brief History of Super Mario Bros.

3.1.1   The Game − Significance of Storytelling and Coincidences

Super Mario Bros. is a side-scrolling platform game developed and published by Nintendo for the Nintendo Entertainment System or NES in 1985. It is a sequel to the 1983 video game Mario Bros., a single-screen platformer initially released for arcades, which itself was a spin-off of the character initially known as *Jumpman* in the arcade classic Donkey Kong.

Shigeru Miyamoto, a 31-year old graphic artist but then-inexperienced game designer, was handed the job to create a video game by the Nintendo CEO Hiroshi Yamauchi. Miyamoto came up with the idea of designing the gameplay around a story. He based his plot on the Popeye love triangle, where a giant ape replaced Bluto, and a character then known as Jumpman subbed for Popeye the Sailor Man. Jumpman is a carpenter trying to save Lady from the villain, a large gorilla, who hurls barrels at him as he scales the construction site. Among the inspirations for the characters was King Kong, thus the gorilla was named Donkey Kong.

Nintendo released the game Donkey Kong in 1981, but the developers deemed the name Jumpman too vague for the international audience. Coincidentally, while trying to come up with an alternate name, Mario Segale, an Italian-American property owner, angrily barged into Nintendo's American headquarters in order to collect their long overdue rent. It was a breakthrough for the American staff who thought it was the perfect name for Jumpman. Hence, the eponymous hero Mario − a character that would later not just become the official mascot of Nintendo, but also the most iconic video game character of all time − was brought into being.

A spin-off featuring this character, Mario, and his brother Luigi, was released in 1983 primarily as a side-scrolling arcade game. But what followed was a period now known as the *Atari shock* in Japan. Many video game experts regarded the massive decline in the video game industry at the time as the most extraordinary and disastrous event in the history of video games in 1983

is now referred to as the Atari shock in Japan. (McLaughlin 2010, Ernkvist 2008)

In a desperate and bold attempt by the company to cover their loss after the 1983 video game crash, NES repackaged and updated the plot and gameplay of the Mario Bros. arcade release into Super Mario Bros., designed for its NES game consoles. It has become one of the world's most iconic platformers and is the fifth best-selling video game of all time with more than 40 million copies sold by 2016, according to Forbes.

In 2015, Super Mario Bros. celebrated its 30th anniversary.

3.1.2   The Plot

Super Mario Bros. has a straightforward plot but it became an essential basis for every succeeding Mario game. According to the game manual, one day, the *Koopa Troopas* or simply *Koopas* invaded the *Mushroom Kingdom*. The Koopas are a tribe of turtles known for their black magic. They are led by the evil sorcerer *Bowser*, also known as *King Koopa.* Koopa is a pun on *kappa*, a turtle or tortoise-like demon that inhabits the lakes and rivers of Japan in Japanese folklore.

The peaceful and quiet *Mushroom People* were turned into stones, bricks and plants, and the kingdom was brought into ruin. Only Princess Peach (also known as Princess Toadstool), daughter of the Mushroom King, can undo the magic spell on the Mushroom People and turn them back to normal. Unfortunately, she was kidnapped and kept captive by King Koopa.
Mario, the hero of the story, heard about the crisis of the Mushroom People and embarked on a quest to rescue the Mushroom Princess from the Koopas and restore the ruined Mushroom Kingdom.

The Koopas are often one step ahead of Mario. As he makes his way through dangerous territory fighting to get to Princess Peach, he is forced to fight Bowser or his proxies at the end of every level. During his exploits, Mario

uncovers clues as to where Princess Peach is hiding and collects magical powers and tools to aid him in his fight.

3.2   Italian Americans in New York

New York has been dubbed the *Italian American capital*. It is home to the largest Italian American population in the United States, distributed across the city's five boroughs − Brooklyn, the Bronx, Manhattan, Queens, and Staten Island. The Italian community helped shape the modern city and deeply influenced New York City's culture, arts, dialect, politics, and most evidently, cuisine. Italian food is quintessentially the staple food of NYC diet, most popularly pizza and spaghetti, as well as espresso and specialty coffee drinks.

In the 1860s, a massive influx of Italian immigration to the United States began that turned into a deluge at the turn of the 20th century. Almost two million Italians emigrated to America between 1900 and 1914 on overcrowded ships, most of whom disembarked in New York. By 1930, over a million Italians (an immense 17 percent of the city's population) had made NYC their home. This population of newcomers was the third largest, next only to the Irish and German immigrants.

Fresh waves of Italians flooded into New York as relatives, friends and neighbors sought to join those who had already settled in their new homeland. This phenomenon continued to forge a long link in the migration chain. Everyone knew each other and were related in some form to most of the people living in the same neighborhood.

The majority of Italian immigrants, known as *contadini* (landless peasants or tenant farmers), primarily came from Southern Italy and Sicily. They fled to the land of opportunity towards the end of the *Second Industrial Revolution* (rapid industrialization primarily in Britain, Germany, and the United States in the late 19th to early 20th century), to escape poverty, violence, political instability and civil chaos in their motherland. They came from small towns and hamlets to a buzzing megalopolis. A few of the initial arrivals were young men looking for work; *birds of passage* who were determined to return home and bring their

earnings to their families. Men were occasionally employed by *padroni* or labor brokers, who paid their entry, food and shelter, and hired them out as work gangs; often helping themselves to most of the wages.

Because of their lack of education and knowledge of the language, many men were set to back-breaking work as longshoremen, laborers, bricklayers, digging ditches, paving roads, and constructing critical infrastructure like the Brooklyn Bridge, Grand Central Terminal, and subways. Several of those who stayed permanently opened small businesses such as groceries, meat shops, and barbershops. Women and girls worked principally in the textile and clothing industry and were mainly the breadwinners as they found stable work in factories and needlework. Sometimes they would take piecework home to supplement the household income.

From the moment the Italians set foot on their adopted land, they faced the dilemma with which most immigrants all over the globe are familiar– how to fit in and carry on. Generations of Italian Americans have been able to assimilate and manage, while maintaining a strong connection with their Italian heritage. The balance of old traditions and culture and the new guided their lives. Most aspired to own homes. Owning a piece of property has been the fundamental ethos, the ultimate goal for working class Italian immigrants – the *American dream*.

Maria Bartiromo, an American television journalist, native of Brooklyn and granddaughter of Italian immigrants narrated in a PBS segment on *Italian Americans of New York and New Jersey*:

> *"They came from nothing", a familiar refrain among this generation of Italian Americans, whose grandparents and great-grandparents did have optimism in abundance. They were convinced that hard work in America would change their lives."*

They built lives for their families and the young ones were taught to work hard for whatever they wanted to achieve, be it taking over the family business or working in white-collar professions. Italian American children were sent to school to attain a better education than the generations before them.

Italian American life centers on family, tight-knit communities, traditions, food and faith. Common to immigrants dealing with language and cultural barriers, the Italians formed ethnic enclaves. The earliest communities were drawn together on Mulberry Street (the heart of Manhattan's *Little Italy* in the late 19th and early 20th centuries), East Harlem, and in Greenwich Village. They sometimes clashed with other immigrants, particularly when they had no choice but to share churches with the Irish Catholics. And although they were generally labeled by New Yorkers as "Italians", each group primarily identified with their home region or towns and established their segregated neighborhoods accordingly, e.g. *Neapolitan*, *Calabresi*, *Apulians*, etc.

Confronted with poverty and discrimination, Italian communities founded mutual aid societies, as well as associations focused on culture and the arts, and religious festivals. The less charitable kind of organizations also rose, namely the crime syndicates of *La Cosa Nostra*, whose foundation was heavily influenced by Sicilian secret societies. During *Prohibition*, the *"families"* evolved into the *American Mafia*.

Italian immigrants dreamed of leaving their poor living conditions − dilapidated tenements and congested streets of their neighborhoods. All through the 20th century, their descendants followed suit. These days, Italian districts have spread out to Bensonhurst and Bay Ridge in Brooklyn, Ozone Park and Howard Beach in Queens, the Bronx's Belmont, and Staten Island where 55% of the inhabitants are of Italian lineage. However, remnants of the old-world Italian immigrant culture are still found in the old neighborhoods. (Dobbins 2013)

To this day Italian Americans still focus on the fundamental values instilled from childhood. For many, success depends immensely on strong family ties. The younger generations take over and apply the skills and more advanced knowledge they have learned with proper education to build up the family business. Children of a long line of butchers now run their own meat business. Those who come from a family of chefs put up chains of restaurants and

cafes. Furthermore, educated children of grocers and farmers now own and run supermarket chains and wineries.

At present, Americans of Italian ancestry are the seventh largest ethnic group in the United States.

3.3 History of 80s New York City

3.3.1 Organized Crime and Violence

The *American Mafia* is a highly organized Italian-American crime syndicate. The members of this organization refer to it as *La Cosa Nostra* or *"Our thing"*, and the name is commonly referred to by the press and public as the *Mafia* or *Mob*. Little is known about the origins of the word *Mafia*, only that the title was coined in the US and derived from the Sicilian term *mafiusu* (or *mafioso* in Italian), which roughly translates to "swagger", but could also mean "boldness" or "bravado".

The American Mafia operates in cities all throughout the United States particularly in New York and Chicago. They rose to power by way of success in the bootleg liquor trade during the *Prohibition* era in the 1920s, when production, sale, importation and transportation of alcoholic beverages was constitutionally banned nationwide. It was an attempt to reduce crime, family violence, social problems and activism prompted by political corruption, and as a means to improve the declining health and hygiene in America encouraged by the U.S. Protestant denominations.

In the beginning, these unnamed neighborhood gangs often terrorized their own community, the first-generation Italian Americans. However, when Prohibition began, they saw it as an opportunity and transformed themselves into a sophisticated network of criminals highly trained in smuggling, money laundering and bribing the police and other public authorities. Meanwhile the Italian Mafia in Sicily, which had thrived since the mid-19th century, was under fire from the dictator Benito Mussolini's Fascist regime. A few Sicilian *Mafiosi* fled to the United States, where they took part in bootlegging and became part of the flourishing American Mafia. The American and Sicilian Mafia were

separate and independent entities, although the Americans followed and practiced some Italian customs including *omertà* − a code of honor, conduct and secrecy that prohibits cooperation with government authorities and interference with the illegal actions of others. Breaking this blood oath is punishable by death.

In the late 1920s, the *Castellammarese War*, a bloody turf war, broke out between New York's two most powerful Italian American gangs. In 1931, after the gang led by Sicilian-born mob boss Salvatore Maranzano crushed the other faction, he proclaimed himself the *capo di tutti capi*, the "boss of all bosses" in New York – the *"Godfather"*. A rising goon Lucky Luciano, apprehensive about Maranzano's power grab, ordered his murder that same year. Thereafter, Luciano formed and masterminded the *Commission*, a central organization that functioned in many ways as the American Mafia's national board of directors, which by that time had at least twenty *crime families* across the US. New York had become the capital of organized crime and was divided into five major Mafia families. Only one crime family was allowed to exist per city where the Mafia operated except New York City. The Commission functioned as policy-maker and mediator in disagreements between the families.

After Prohibition was repealed in 1933, the Mafia expanded into drug trafficking, illegal gambling, theft, loan-sharking, extortion, prostitution, and infiltrated labor unions and legitimate establishments such as New York's garment industry, construction, trucking, restaurants, garbage collection and nightclubs. By the mid-20th century, 24 crime families existed in America. Before the 1960s, some government authorities, including J. Edgar Hoover (the first Director of the FBI), were unconvinced of the existence of an Italian-American organized crime syndicate nationwide. They believed without doubt that crime syndicates operated on a local level. Consequently, law enforcement agencies failed to nip the Mafia in the bud before they spread to the rest of the country.

In 1970, the *Racketeer Influenced and Corrupt Organizations (RICO) Act* was passed by Congress, which finally enabled prosecutors to pursue crime

families and their sources of revenue, whether illegal or legal. In the 1980s and 1990s, the RICO laws were a powerful tool used to convict plenty of high-level gangsters. Several Mafiosi, threatened with long prison sentences, broke their sacred code of honor and silence, "ratted out" and testified against their fellow mobsters and negotiated for a place in the witness protection program. Meanwhile, Mafia membership began to decline as isolated Italian American neighborhoods, traditionally the recruitment site for mobsters in the past, went through demographic shifts and had assimilated into the evolving society.

By the turn of the 20th century, the American Mafia was just a remnant of its former glory. Nonetheless, it never ceased its traditional illicit ventures. The Mafia's savage crimes, secret rituals, and infamous figures such as Al Capone and John Gotti, have interested the public and have become pop culture icons. Mafia boss John Gotti, was dubbed the *"Teflon Don"*, after being acquitted of charges in three high profile trials.

In the late 20th century, the government enforced anti-racketeering laws to convict mobster ringleaders and weaken the Mafia. However, the mob lives to this day.

3.3.2   The Guardian Angels

In the late 1970s, while employed as a night manager at a McDonald's in The Bronx, Curtis Sliwa founded the group *Rock Brigade*. Their aim was to clean up the neglected streets of New York City. The members each volunteered one night a week and they started sweeping and cleaning up Fordham Road. The Rock Brigade was applauded and awarded by the government and the community for their work around the city. Sliwa made a name for himself by promoting community pride and concern for the well-being of the public. However, it was his consciousness and awareness of the city's other needs that drew him and the volunteers into a new direction.

The late 70s was a grim period for New York City, with its huge budget shortage, industrial decline, crime, violence, anarchy and the *crack and heroin epidemics* were an ever-increasing problem. The community desperately needed neighborhood watch groups, but they were not necessarily welcomed.

To compensate for a shortage of police patrols, Sliwa redirected the group's effort to fill the gap in crime fighting – to clean up the streets of a different kind of scum. The group began patrolling the subway sporting their identifiable red berets, which is known today as a universal icon for safety. The first 13-member, multi-racial crew of volunteers came to be known as *"The Magnificent Thirteen"* (Figure 1. The Magnificent 13).

The weaponless group rode the subways between the most critical stops to prevent crimes perpetuated against commuters riding the subway system. These fearless volunteers would scour the lines for gang members and muggers victimizing straphangers or standing passengers in the subway and keep them in custody until the police could arrest them. Their presence alone deterred criminal activities. As the group became famous for their heroic deeds, they attracted more volunteers to join their cause. On February 13, 1979, they became known as ***"The Guardian Angels"***.

These days, thousands have joined The Guardian Angels in over 130 cities in 13 countries. They exist to protect their communities, improve the quality of life, and serve as role models and lead by example. They have extended their role from safety patrol to internet-based training of members to make citizen's arrests for violent crimes, youth programs, and animal protection.
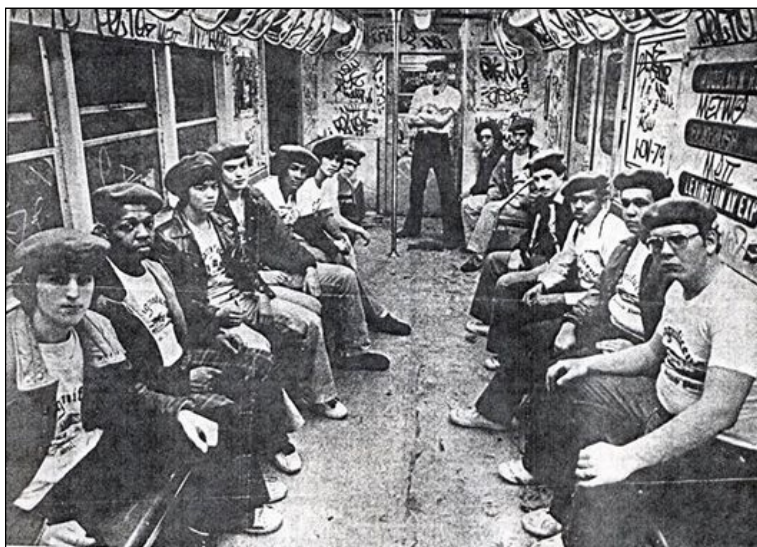
Figure 1. The Magnificent 13

4   THE DESIGN

4.1   Character Design

There have been speculations about Mario and Luigi's last name since the game was released. In the 1993 Super Mario Bros. film, Luigi claimed that Mario's last name is Mario. Therefore, Luigi's full name is Luigi Mario. However, in an interview with Game Informer's Dan Ryckert during the game's 30th anniversary in Japan in 2012, the Super Mario Bros. creator Shigeru Miyamoto stated:

> *"But, just like Mickey Mouse doesn't really have a last name,*
> *Mario is really just Mario and Luigi is really just Luigi."*

The author came up with the name Mario Rossi, which is Italian for **John Doe**. Tory (Mario's partner) is an Irish name which means "from the knolls", and is a short form of Victor meaning "conqueror" or "winner". His last name Stoole was taken from the Irish last name O'Toole which means "mighty or prosperous people".

The Tartaruga (Italian for turtle) crime family represent the Koopa Troopa tribe.

Figure 3. Character design sketch, Luigi and Mario Rossi. (Rukkila 2017)
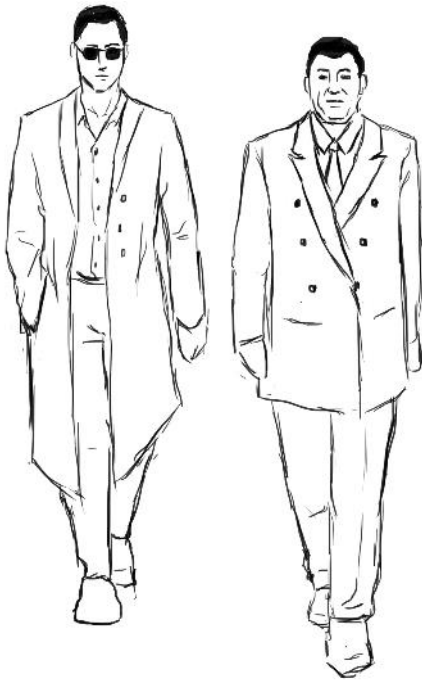
Figure 4. Character design sketch, The mob underboss and boss. (Rukkila 2017)

Super Mario Bros. Characters and Elements and their Real-world Counterparts	
Super Mario Bros. Characters and Powerups	Real-world characters and items
Mario	Mario Rossi (undercover cop/sometimes posing as a plumber)
Luigi	Luigi Rossi (brother/plumber)
Toad	Tory "Toad" Stoole (Mario's Field Training Officer and partner)
Princess Peach Toadstool	Patricia "Peach" George (socialite, kidnapping victim)

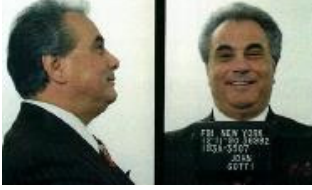|	
Goomba	Goombah and "Boombots" − mob associates
Koopa Troopa	Mob footsoldiers
Koopa Paratroopa	Mob Underboss/Capo
Spiny	Punk
Bowser/ King Koopa	Mafia Boss/Bruno Caputo
Fire Flower powerup	Taser
Starman powerup	Detective's badge and Bulletproof vest

Figure 2. Super Mario Bros. characters and elements and their real-world counterparts. All the Super Mario Bros. character names and illustrations are the sole property of Nintendo. The photo provided for the Mafia boss character Bruno Caputo is a mugshot of gangster boss John Gotti Jr., taken by the Federal Bureau of Investigation in December 11, 1990.

4.2 Visual Style and Design Elements

The visual style is reminiscent of The Beatles' 2016 digital release of the surreal music video for the song *Eleanor Rigby* (Figure 5), which is a sequence originally used in the 1968 feature film *Yellow Submarine*. The film pioneered in augmenting state of the art *limited animation* techniques and concepts with photography, rotoscoping and 3D sequences that gave them freedom to explore otherworldly psychedelia and a world of utopian proportions. This led the way for such animations as Terry Gilliam's TV comedy series *Monty Python's Flying Circus*, which is akin to the style of Eleanor Rigby in particular, and the early season animations of the children's TV series *Sesame Street*. (Hill 2012)

Walt Disney and Pixar Animation Studios Chief Creative Officer John Lasseter writes in an essay:

> *"As a fan of animation and as a filmmaker, I tip my hat to the artists of Yellow Submarine, whose revolutionary work helped pave the way for the fantastically diverse world of animation that we all enjoy today."*

Figure 5. The art style is reminiscent of The Beatles' 2016 digital release of the surreal music video for the song *Eleanor Rigby*, which is a sequence originally used in the 1968 feature film *Yellow Submarine* (Youtube 2016).

Other inspirations for the visual style are Richard Linklater's Sci-Fi dystopian films *A Scanner Darkly* (Figure 6) and *Waking Life*. Both are also inspired by

the aforementioned classic films and TV series. These were the original environment design aesthetics the designer intended to achieve, but opted for the more simplistic approach of *Eleanor Rigby*, which has less detail. The kaleidoscopic characteristic of such style alludes to the fantastical realm of Super Mario, but the realistic animation especially that of human movement (achieved by tracing live action footage) bridges it with the real world. Additionally, the dark undertones of both the narrative and graphics are inspired by Frank Miller's neo-noir film *Sin City* (Figure 7).

Figure 6. A scene from *A Scanner Darkly*, a 2006 animated dystopian Sci-Fi thriller by Richard Linklater based on the 1977 novel of the same title by Philip K. Dick. The film was shot digitally and animated using *Rotoshop*, a graphics-editing program essentially created to aid the artists in creating nuanced expressions and gestures of the characters in the film.

Figure 7. A scene from *Sin City: A Dame to Kill For (2014).*

5   THE PROCESS AND WORKFLOW

5.1   Tools and Techniques

The processes and software (the latest, most stable and compatible release at the time of this writing) required to build a prototype for the game environment are as follows:

- 3D Ripper DX v1.8 for capturing 3D models.
- Google Earth 6.2.2 where the models can be extracted (newer versions are not compatible with 3D Ripper DX).
- DirectX 9 or a higher version for rendering (older versions are not supported by 3D Ripper DX).
- 3ds Max 2011 for importing and editing models (.3dr files cannot be supported in newer versions).
- Photoshop for editing materials (versions CS to CC).

5.2   Extracting 3D Models from Google Earth with 3D Ripper DX

To capture 3D models from Google Earth, 3D Ripper DX must first be installed. According to the tool's developer Roman Lut, it was originally designed as an analysis or debugging utility for programmers. However, it got a lot of attention from 3D artists due to its ability to reconstruct geometry into a 3ds Max scene and is also compatible with Autodesk's Maya. Although this project has been discontinued, 3D Ripper DX can be officially downloaded from http://www.deep-shadows.com/hax/3DRipperDX.htm.

After installation, Google Earth must be loaded through 3D Ripper DX (Figure 8). However, the author encountered a series of software incompatibility issues. Since the operating system being used is Windows 10, it is nearly impossible to downgrade DirectX 12 to DirectX 9, which was the API (Application Programming Interface) utilized before the discontinuation of the 3D Ripper DX development. After trying various combinations of software versions, the author identified that the best solution is to downgrade Google Earth. As of December 17, 2015, Google Earth Pro 7.1 is available for download without cost and can be used without a license key. However, the

latest working version is Google Earth 6.2.2.6613, build date April 11, 2012. Google discontinued support for this version, but the direct installer can be found in their Google Earth Help Forum at https://support.google.com/earth/answer/168344?hl=en.

After these technical issues are addressed, the user can load 3D Ripper DX without trouble. The proper folder paths are crucial, otherwise model extraction will not work. Input the location of Google Earth as well as the output directory of the captured or extracted models. In the case of the latter, it is the user may choose where to allocate them. Nevertheless, the folders Frames, Textures and Shaders must be created accordingly. It is also worth noting to deselect all options but "Capture all textures". Then start Google Earth by clicking on the "Launch" button in 3D Ripper DX.

Once Google Earth is launched, in the 3D View options in the Tools menu (Figure 9), DirectX for Graphics Mode and "Use safe mode" was selected. A certain indication that the 3D Ripper DX and Google Earth installed are compatible is the "Ready to capture." highlighted in yellow appearing on the upper left portion of the main window or the 3D viewer that shows the globe and map features (Figure 10).
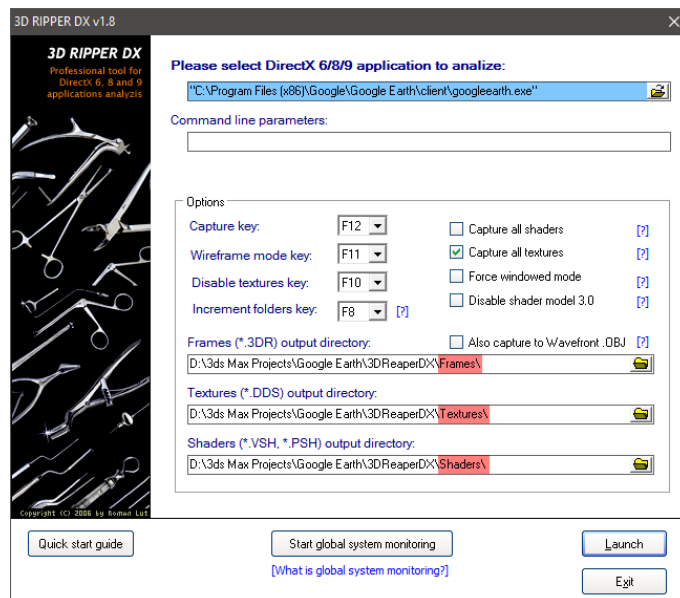

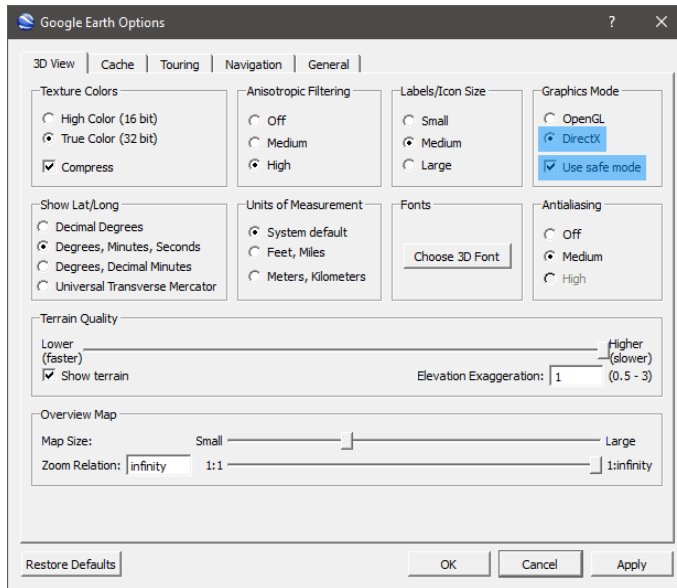Figure 8. Launching Google Earth with 3D Ripper DX.

Figure 9. Google Earth Graphics Mode options selected.

In Google Earth, the area to be selected for capturing the models were zoomed in (Figure 11). It has been observed that limiting the range to not more than 12 blocks provide a better result in data extraction. The fictional world of the titular character Mario Rossi is in Brooklyn, but The Bronx borough has neighborhoods more suitable for the purpose of this study. Therefore, certain elements from both boroughs were extracted and combined. To capture, press F12.
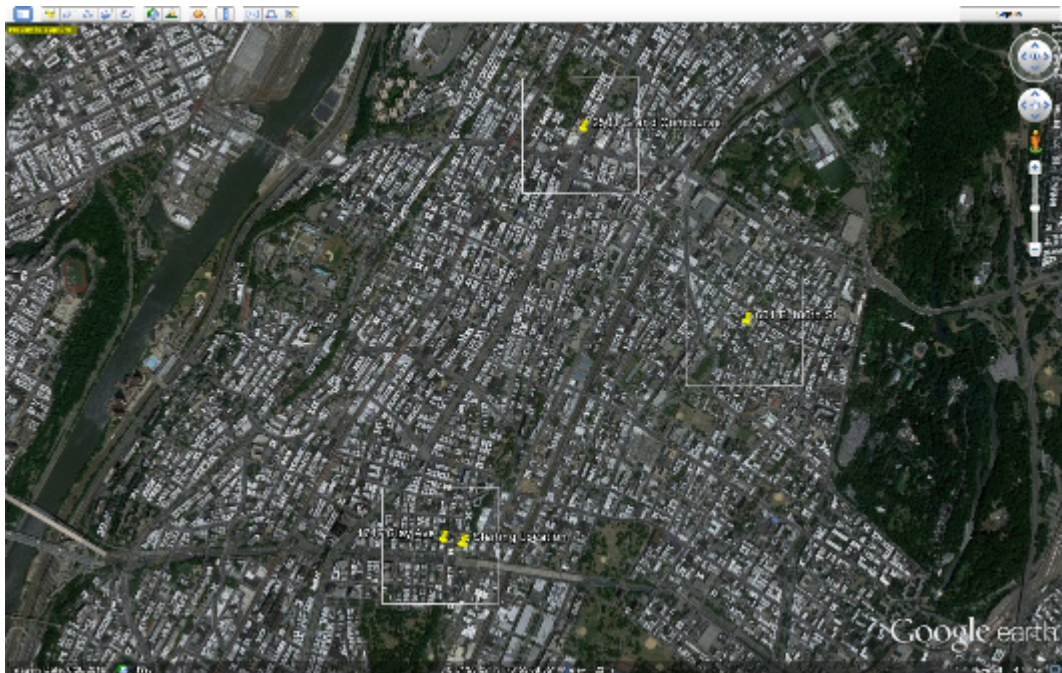

Figure 10. The areas of the buildings' models captured in Google Earth. The upper left portion of the map should show "Ready to capture." highlighted in yellow.

Figure 11. The buildings' 3D models in Google Earth's Ground Level View.

It takes two minutes or less to capture the models from an area as large as The Bronx. The captured models are automatically extracted to the user's designated locations. The generated 3DR file or files to be imported to 3ds Max can be located in the Frames subfolder in the 3D Ripper DX output destination.

5.3   Importing the Models to 3ds Max

In 3ds Max (take note of the versions mentioned in Chapter 5.1 Tools and Techniques), setting up the system units is crucial prior to commencing work to keep all units uniform throughout different platforms, whether the project will be exported to a game engine or another 3D modelling software. For this scene, the Display Unit Scale is set to Metric. In the System Unit Setup, 1 Unit is equal to 100 Meters.

Import the 3DR file from the Frames folder (Figure 12). For the 3DR import options, it is important to set the FOV to 60 "for width" since the Horizontal FOV (Field of view) used in Google Earth is 60º by default, as discussed by Timothy Whitehead at www.gearthblog.com. The Monitor Aspect Ratio should be set to the corresponding ratio of the monitor used, in this case 16:10. However, to be more accurate, the actual monitor aspect ratio inputted is a custom value of 1.618, the Golden ratio. To compute this value, a screenshot

of Google Earth in full screen view was taken, and the 3D viewer selection was cropped. The resulting image shows the accurate monitor aspect ratio value needed for the 3DR import options. This value can be computed by dividing the image width by the height (1570 / 970 = 1.618) (Figure 13).

Once the 3DR frame is imported, the main screen or viewport appear to be empty. This is due to the rather small overall scale of the scene. By pressing the hotkey "H", this initiates the action "Select by Name". In the "Select from Scene" dialog box, select all objects and group them. Once grouped, scale the grouped objects to **6 387 000%**. The author arrived at this value by trial and error starting from 10 000%, and the proceeding values at increments of 100 000 (Figure 14).
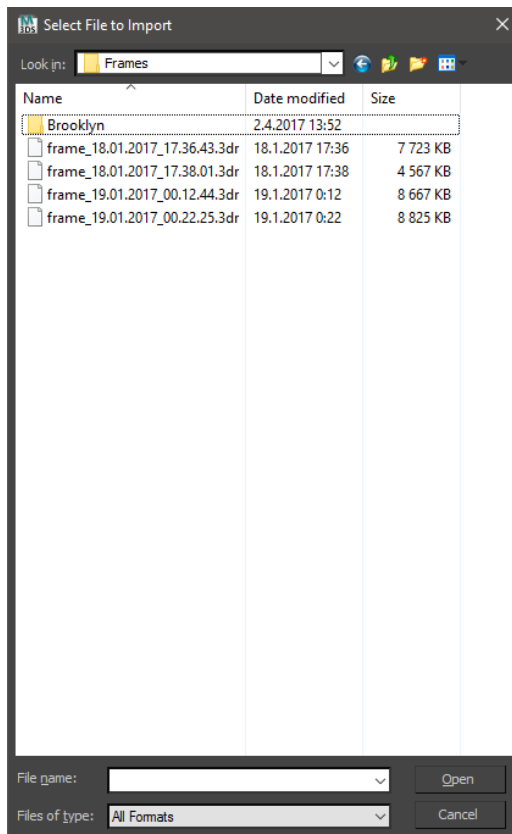

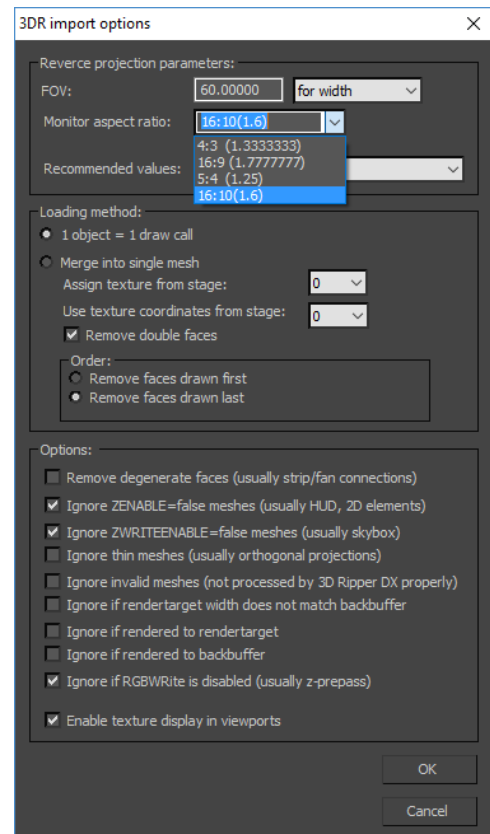Figure 12. Importing the 3DR frame.

Figure 13. 3DR import options.

When the group of objects has been scaled, it is clear that the orientation is incorrect. Activate the Angle Snap Toggle then rotate the group and snap it to -90 degrees on the z-axis.

To check the scale, a box was created next to one of the buildings with the dimension of 24, 12 and 18 meters consecutively for length, width and height. This box represents a six-storey building to check the scale value's accuracy. After ungrouping and detaching buildings from other structures, e.g. ground, roads, bridges, etc., the *bounding box* for a single object either appeared larger than the actual object or misaligned, and *pivot points* were scattered everywhere. These were fixed by selecting all the objects in the scene and resetting their XForm from the Utilities menu under the Command panel. All the objects' pivot alignments except for the ground were then adjusted to *Center to Object* while universally setting their z-axis to zero temporarily. Some buildings may be situated on varying elevations with respect to the terrain and other geographical data obtained from Google Earth.
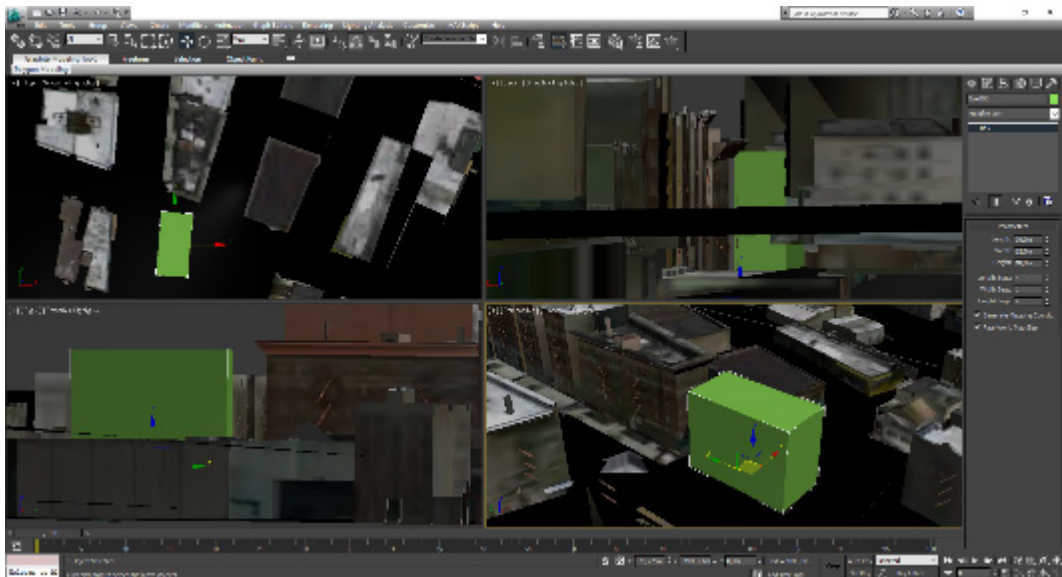
Figure 14. Scaling of the whole environment in 3ds Max is by trial and error. The most accurate value is a universal scale of 6 387 000%. The reconstructed Brooklyn neighborhood is the new fictional world of Mario Rossi.

5.4   Generating Textures with Photoshop

Textures for the buildings' facade were taken from screenshots of the corresponding buildings in Google Earth Street View. However, it is not necessary to apply textures to all the buildings, as the objective is to make a quick prototype of the city (Figure 15).

Figure 15. One of the building facade's perspective corrected in Photoshop.

5.5 Results

The images produced were not rendered. They were screenshots taken from 3ds Max Perspective viewport. Various filters were then applied to achieve the visual effect. The rapid prototyping results can be found in Appendix 5. Rapid Prototype Scenes.

6 CONCLUSION

The aim of this project is to demonstrate one option for transforming a side-scrolling game platform with straight-forward gameplay into a more sophisticated 3D environment that accurately reflects historical, architectural and geographical information in an approximated version of the real world. Players should be able to move through this environment gathering evidence to solve a larger mystery. Considering gameplay is grounded in the presentation of a believable real-world scenario with multiple mysteries to solve, the narrative and storytelling are critically important. Further, enabling an immersive experience requires development of an environment and atmosphere that approximates the real-world and historical context in which the story is set.

The narrative was written in the first-person point of view to demonstrate depth to the character, mannerisms, and thought and speech patterns. This *Private Eye Monologue* narration style is common in *Film noir* (French for

"black film"), including but less commonly the modern *Neo-noir* ("new-black"). The characters were often depicted as conflicted anti-heroes who may sometimes do the right thing because of their self-interest. I am not personally familiar with the nuances of 1980s New York City street colloquialisms, but through careful research and exploring television and film set in this era, I developed a working speech pattern and linguistic style that is generally consistent with the main character's background and geography.

Building the environment required understanding and incorporating real-world structures and textures to ground the gameplay in accurate representations of New York City. Not all buildings in Google Earth have custom-made 3D models created by public contributors. When models were not present, they must be filled in and provided by the designer, either by copying and modifying an already existing, similar-looking building or by making their own low-poly models and applying edited materials of pre-existing buildings. In the case of building an alternative New York City for this paper, my foundation was Little Italy in Brooklyn, but I laid some structures from some neighborhoods in the Little Italy of The Bronx.

Providing a realistic approximation of real-world Brooklyn and the Bronx as the setting for a Mario-inspired game is likely to have an effect on the player's engagement and connection to the game environment as opposed to a straight-forward side-scrolling platform. While such an environment and the mechanics of navigating a 3D world may prove more challenging to play, engaging and interacting with this environment is part of the draw and excitement of the format. The aesthetic detail would be a primary focus, though the gameplay also aims to build investigative skills and strategic thinking as a key objective.

Following the advice of my thesis supervisor Sarah-Jane Leavey, I was able to narrow down my formerly broad topic and focus on world-building and the narrative. The original objective to apply photorealism on the visuals is unnecessary, as the objective became to make a rapid, approximated prototype. Additionally, the game physics have not been tested due to time constraints and limited resources.

This study potentially could be developed into a game in the near future. A prototype of the game environment has been exported and tested in Unity, and one of my initial collaborators hoped to experiment with the prototype in a game engine. A second collaborator, who will be pursuing further study on this topic, Emmi Rukkila, will be further developing the characters for this project. I hope to pursue further development of this game proposal by bringing on several collaborators to assist with narrative development, artistic development and character design, and programming to create a playable, multi-level game. This concept could potentially be developed into an interactive movie released in several episodes or a first-person action-adventure game.

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Figure 15. One of the building facade's perspective corrected in Photoshop. Mountain Valley: Adobe Systems, 2017.

1980s NEW YORK IN PHOTOS – UNDERCOVER COPS

An undercover cop arresting a suspected mugger.

Undercover cops arresting a drug dealer.

1980s NEW YORK IN PHOTOS – THE MOB

The mob – John "The Teflon Don" Gotti and his men.

Gotti ordered a hit on another mob boss, killing him and his bodyguard on the street.

THE GUARDIAN ANGELS

The Guardian Angels patrolling the subway.

The Guardian Angels take it to the streets of New York.

MOOD BOARD

THE NARRATIVE

Note: This section contains explicit informal language to support the first person voice and perspective of the main character. See the end of the narrative for translations.

It's ah-me, Mario Rossi.

You may ha' heard of that **one** big case made my name – made all our names really – it started when we were tracking down the kidnappers of Brooklyn socialite Patricia – Peach – George. Eh, but that's only a small part of the story.

Let me start at the beginning.

I was born September 13, 1959 in Brooklyn, New York to immigrant parents. They was poor but proud and idealistic, hoping to seize that American dream. They were italoamericani from Napoli. Eh… that's Naples to you. My father came to America to find work while my mamma was pregnant with me. He worked for a little plumbing and heating company down in Little Italy. And no, I ain't talking Pleasant Avenue. I'm talkin' East Harlem. There's nothing pleasant up there but the Sicilian ladies and sweet cannoli.

See, 'round that time the whole place was the realm of the East Harlem gangs. You don't wanna cross the Mafiosi. Them wiseguys were bloodsucking, spineless scumbags whose fathers were either dead or wound up in the slammer – guests of the state.

Anyway, my Papà was a self-made man. He worked hard day and night, but always managed to get home right in time for dinner… he was rarely late for my mamma's special *pasta al ragú napoletano*. Spaghetti and meatballs – an American mockery − has nothin' on mamma's heavenly pasta sauce with real meat, see?   Now where was I? Ah… my old man. After eating his fill, shoving off from the table with his trademark, "*panzagin*, delicious," six days a week he would go back to work for extra pay. I seldom saw him home early. But

Thursdays were **ours**. He would come home around nine and just us boys would watch Dragnet on the tube. We were suckers for cop shows and Steve McQueen.

By the time I was ten, a little rascal starting to roam further from home, he had finally opened his own plumbing and repair shop. It weren't much, a modest little knock-about shop, but the days of going door to door - unclogging another P-trap - were behind him. He had men to do the messy jobs. He was proud of his store, that he had made it after arriving here with nothin' but a pregnant wife and a desperate sort of hope. As a kid, he told me stories about his papà and grandfather − proud master plumbers from Napoli. I always reckoned it would do him proud if another Rossi followed family tradition and carried on with his shop.

But I never took interest. I'd rather get my hands dirty in the kitchen learning my mamma's special recipe or spend all day outside running around with them Esposito kids. We'd race around the neighborhood and taunt each other to jump over Johnny Pumps, climb fences, rooftops, trees… and it was always the same dare: the last one to climb the flagpole paid for everybody's pizza down at *Regno dei Funghi.* Even now, their *pizza napoletana speciale* is to die for.

Hold on. There was something I wanted to say. I always stray when I talk about food - or *when* there's food. Pardon me. Oh, yes, yes! My brother Luigi. Have I mentioned I have a twin brother? He always has been a good guy, a loyal paesan'. We were close, but nothing alike, save for the identical mustaches we started growing in our late twenties on a bet that never died. He's as lanky as the Empire State, while I'm a bit on the pudgy side. I liked the action outdoors and being surrounded by people, while he used to spend his free time at our father's shop either learning the trade or sitting by the window, watching the world go by. He's the shy one, but the ladies seemed to be into that.

Well, it sounds like an Italian-American dream, our own business, mamma's pasta every night, and runnin' around with other kids just like us, daring until the dares got bigger than our egos. But, it started to change. When we were 'bout ready to start making our own way in the world, it became clear that to make it anywhere in East Harlem you had to pay to play, you had to grease the skids.

By the time I was 22, we was still reeling from the blackout riots of '77 and the gas crisis of '79. New York was being pulled apart at the seams. There was no money it seemed for nothing, not from the government, not from the city, certainly not from the poor italiana families just trying to get by. They called it the "Reagan Recession", but it felt like the end of the world at the time. The roads were crumbling, parts of Brooklyn were still black and soot, the docks were slowing to a standstill, no honest work and trade to be found there. The Mafiosi were gettin' bolder, what with the reductions in the police and more and more cops on the take.

So, like a lot of boys at the time, I was still at home looking for honest work when it happened. The single event that set my life into motion.

It was the summer of '81, and the whole city seemed to stand still under the weight of a sweltering heat that day. I remember Papà burst into the house late in the day, dartin' straight for the kitchen as if his pants caught fire. He reached for the kitchen drawer and heaved a sigh of relief, *"Always keep a spare pipe wrench, mio figlio. It's a plumber's little companion. It will save your life one day, like it will mine today. Same goes for your grandpapa and his father before him. Now it's back to work. Tell your mamma I'll be home late tonight."* He was out again before I realized what had happened… my father has a knack for theatrics - and hand gestures - as did his father and his father's father before him.

After a late dinner, I sat down to the finale of Hill Street Blues. Last ten minutes of the show and he wasn't home yet… and I couldn't imagine what

would'a kept him. I remember thinkin' it would irk him to hear Officer Coffey got iced and they couldn't ID the shooter.

He still weren't home at 11pm, and I knew something was up. I grabbed the second spare pipe wrench, smiling at the joke I would make at his expense when I saw him.

But what I saw as I stood outside Papà's shop will stay with me til the day I leave this earth. Two scumbags were standing over him, my proud, strong Papà on his knees, while another guy slapped that spare pipe wrench in his palm. It had already been used a few times. I saw evidence: the wince in his eyes, the slump of his body, and the blooming bruises on his face and arms. It was a shakedown, forced into a years-long arrangement setting up a ghost payroll with the Mafiosi to keep his shop open, for their *fugazi* "protection". Only this time he couldn't pay – too few clients, all families paying with whatever they had, never bills, never enough to keep the Family off his back. Papà had refused to take from his customers, his friends, to pay off the debt. He had brought that wrench for his own protection.

I would find out much later that one of those wiseguys made his bones that night by taking out in blood what my Papà couldn't pay in cash. I saw it go down, I saw them beat him, leave him for dead. And I stood their paralyzed, couldn't step-in and couldn't look away.

The next day I signed up to be one of the boys in blue. I knew some were crooked, bought and paid for. But some were good too. And I had to do something.

At his funeral, a capo and his crew showed up. Smirking, with roses for my mamma who thought they may be some of his Union buddies. They were there to send a message. They owned the neighborhood, and anyone who stood up would be chopped down.

We tried to move on. I started the Academy and Luigi took over Pa's shop. They gave us a pass for a few years, no ghost payrolls and no shakedowns, but I knew it wouldn't last.

Mamma was putting in extra hours with the priests and the nuns to ease the hurt of losing Pa, working the soup kitchens and helping at the orphanage day and night. We can't say really, but Lu and I think that's how she got the TB, got in her lungs and it set up shop from there. By the time she thought to see a doc, there wasn't much to do. Still chaps me and Luigi, God failed us twice in the space of a year. We both lost religion, but we found each other. We were all we had left, and we watched each other's backs from then on.

The next few years – nothin' much happened. I was a clean-nosed cop, but I didn't rock the boat, I kept to my beat. Everyone knew about Pa, and I think the bought cops in the precinct thought I learnt my lesson, would be easy to control. So, they set me from workin' the street beat to finally getting the assignment I'd been angling for. In 1985, I was assigned to NYPD's *Organized Crime Control Bureau, Brooklyn Gang and Narcotics Division.*

I got my detective's badge and a new star. It gave me a sense of duty and perhaps a false sense of security, invisibility even. They partnered me right off with Field Training Officer Tory Stoole. We all called him Toad … it was too easy … he was eager to please and snapped-to with a "yessir" every time the captain uttered a word in his direction. When we went for beers, Toad would strikeout with the girls. Luigi would always croak at him… Toad, croaking. It was good fun, and we all needed the fun then.

Toad and I started getting to know the beat, the rascals and roustabouts and thieves in the neighborhood. We were starting from the bottom, the once-off mafia patsies hoping to turn one or two into pigeons. We were good. Toad was observant and made connections out of the faintest dots, turning tenuous reports into real leads. And I always had a way of getting people to talk, a

little stick and little carrot and a whole lotta charm. Plus, I had been jumping over Johnny Pumps with these guys since we were *passerotti*.

So, we got a new assignment. There was a new construction site in Brooklyn – a lucrative boondoggle for the developers, building low-rent housing with the help of city money. Another featherbedding situation, padding the books with fake Union workers to funnel money to the Mafiosi. Or at least that was the theory. The whole operation was kept hush-hush, only the Captain and me and Toad were up to speed on the details.

We initially staked out the place, waiting for the bag man to pick up the monthly wages of the fake workers on the payroll. Weeks rolled on, and we got nothing on them. There was smoke – shady boombots – ah, I forget I ain't talking to a guy from Harlem sometimes – idiot footsoldiers - at shady times, but we couldn't tie them to illegal dealings. It was time to go in.

Word on the street was the company needed a guy to cover plumbing, someone clean that wasn't under suspicion – someone the Mafiosi could turn – they was grabbing cash at every level. I knew the Family that shook down Pa was behind these dealings, and we may just have a chance to nail those scumbags to the wall if we could make a solid case. It was time to go to Luigi. So, I did, I told him everything. What they did to Pa, what a coward I had been, and that the same capo that had been part of the hit was now a goombah, a boss, in the operation. They didn't suspect us, and we had a chance to get on the inside if Luigi took the job.

It didn't take much convincing – my brother is no slack – and he wanted justice as much as me. He also quipped at the time that I would be useless with a wrench and could never develop a rational plumbing system, so he would just have to come with me, to cover *mio culo*. I protested at first, but he could handle himself, and I really needed his help. We decided I would be his assistant, undercover and in plainclothes. He started by showing me the ropes, literally, he taught me how to apply hemp threads (who knew!?) to a

plumbing joint and how to design the proper give and flow. It wasn't easy. It would never be my passion, but it gave me a greater respect for what my father and brother chose as their profession.

It wasn't long before we were in deep enough to see what was going on. The ghost payroll and featherbedding was the deeper, bedrock evidence we were after, but we saw so much double-dealing and criminal activity but could put together little hard evidence on the rest of it.

Instead, we ended up on the trail of a heroin ring operating within the site and led by a few of the foremen. Heroin was burning through New York as hot and quick as the '77 arsons, turning whole neighborhoods into husks of themselves, eaten with crime and broken families and addicts, strung out and desperate. It was enough.

We put together our evidence. Trades made, books of sale, photos of handoffs, and shipping containers full of smack. We made our case and submitted it to our Captain. We all expected recognition, perhaps more men for the unit, an expanded mandate. Before our case was even submitted, the Chief called us on the carpet, blessed us out three ways to Sunday and said we were a disgrace, going after hard-working Union boys for nothing. They discredited the evidence, made us a laughing stock. To this day, I am not sure how they switched out that smack with baking soda and flour. But I know now that the Chief was bought and paid for by the Family. The fix was in and we had been duped. We were pulled off the task force, separated, and thrown back on local street beats.

It didn't take me long to find a different calling. If the Mafiosi had corrupted the system, I would work outside it. I would start with the boombots, make my way to the Capos, the bosses, the head of the Family. I knew their haunts, I knew where they met women, drank with their crew, sold their drugs. I would take out the little guys and work my way up.

I started insinuating myself into their world, riding the trains they rode - in plainclothes - listening, watching, and waiting. I would intervene and crack some heads when I had to, but mostly I gathered intel from the loudmouthed wiseguys bragging about their exploits.

One place kept coming up: the *Mondo Acquatico* laundromat. It was right across the street from my favorite pizza joint, yeah, I mentioned it earlier, *Regno dei Funghi*. It seemed the Mafiosi were laundering more than dirty shirts and trousers, and there was some other shady business going on that the footsoldiers would reference in the vaguest language.

I was going out near ever' night, staking out their haunts, taking notes on all the players, their schedules, their networks of confidants and cops on the take. I was on to something at Mondo, and I was trying to suss out the easiest boombots to turn. I was building an understanding – if not a case – of how corrupt and rotten the city had become.

But there were glimpses of light too.

I mentioned her at the beginning, and this is where Peach comes in. You see, Patricia George was a savior to the neighborhood, really throughout the city. She was the heiress to a real estate and investment fortune. The Georges were royalty in New York, three generations of Italian-American success, seemingly untouched by the mafia. Her parents were patrons of the arts and other elite causes.

But Peach had different priorities, and with her charm and cheekiness she won over the social elite to her more earth-bound work. She funded orphanages, scholarships, soup kitchens, and all kinds of outreach from Hell's Kitchen all the way to East Harlem. Her fundraising galas were popular, elegant affairs, but they always placed the gritty truth of New York and Brooklyn directly in front of those in power. Forced them to face the reality beyond their gated homes and open their wallets. She was a one-woman

safety net for the city's down-and-outs, taking broken souls and making them whole again. She was beloved.

But in 1985, she started treading into dangerous territory. She was setting up safehouses and programs for women who managed to escape from the trafficking rings that were proliferating throughout the city. She had enough money and might in her own right to keep them hidden and protected. The girls under the thumb of the Mafiosi were getting ideas, the chatter was increasing about how to get to Peach's safehouses. She was becoming a nuisance.

All my work, undercover at night, was starting to get noticed by those in the community who wanted a safer city. The trains were a little more tame, and in the few blocks I watched closest, muggings and the like dropped. But these changes were small beans compared to the shadow of the Mafiosi hanging over the city.

Toad and Luigi were none the wiser, at least at first. One night, I got into a particular nasty fight with three footsoldiers, roughing up the owner of a local bodega. I bested them and sent them packing, but not without getting cut up myself. Luigi was waiting outside my door when I limped home, curious where I had been the last few months, and why I had been blowing off him and Toad.

He weren't happy, that's for sure. He lectured me fullstop and told me I was helpin' no one but my own ego and was gonna get myself killed. But there was little fire in his tone, he was sayin' the words, but he didn't believe them either. He started watching my back, same as when we were kids. Driving me to stakeouts, keeping a ready car close by when I was confronting some local thugs. He started helping out more direct too. I had found a hideout, a safehouse of sorts for the regular characters at the Mondo, and I was certain they kept some books on the dealings and players at the laundromat. I never

knew Luigi could pick a lock or would be so precise in covering his tracks, but that *paesan'*, he is full of surprises.

It wasn't long before Toad was on to us. He'd been staking us out on his own. He was furious at first. Dismissed our turn to vigilante justice, and scoffed that we could do "whatever helps you sleep at night," but he swore he'd take no part. But then I had another lead. The same crew that had outwitted us on the heroin ring, they was involved in the Mondo. I needed Toad to get some files and intel from the precinct, something I couldn't do without raising suspicion. I left him a photograph of the Capo we'd been tracking down, listed the file numbers I needed from the precinct, and signed it *"My bed will be cozy as a cloud when Brooklyn is vermin-free. But I ain't sleeping tonight. And neither should you."*

So he joined us. We found out Capo Cottero had been deep into side-dealing and trying to build his own enterprise without the Family knowing. We isolated him with the promise of turning some local cops to his cause. With the information we presented, with the threat of putting it in the hands of his bosses and exposing his power grab, he was ours. Or at least, he talked. We had more information on the network of enterprises from featherbedding to running heroin to human trafficking linked to the operations of the Russians, a joint enterprise at staggering human cost.

Looking back I shoulda had Toad and Lu on my team from the start. We made much more progress with their insights and muscle. We started wearing red berets to make it clear we weren't just thugs, that we were here for protection and anyone could come to us. We were starting to gather more leads from the community, and others started to join us. We vetted them, every one, local boys and one woman that wanted to clean up the streets. After we'd assembled our brigade of 13, Luigi started wearing a green beret, a signal to the others that he was our "engineer", supplier, medic, and arbiter. He worked in the background, and became my voice of reason.

During the day, Toad and I tried to build a case off the books against the Family, but at night we went out with the Guardian Angels and protected those we could. We had started establishing ties with the Peach safehouses, making sure community members knew how to get the city's most vulnerable out of harm's way.

It was at this time, with the growing presence of the Guardian Angels and the rise of the safehouse network that Patricia George disappeared. Many rumors flew in the elite circles, but those of us who worked the streets knew who had taken her. It was the Family. No ransom demands had yet been made, and it wasn't clear if they would be. We knew we had to find her fast, or risk not only undoing her work but frightening the people of Brooklyn who would take back their city.

We pressed our contacts and leaned on every pigeon we had in our pockets. We considered leaking Capo Cottero's misdeeds just to blow up the hierarchical stasis of the enterprise. We knew the Mondo was at the center of the money laundering and often used as a trafficking through-point. And the guys last seen with Peach were on our list of regulars there. We used all our assets to infiltrate and raid the place. It was no easy feat, and we put a lot of our people at risk.

But the whole trail of bread crumbs that had led us to the Mondo, it was fugazi, a set-up. They lured us into an ambush. We made our way into the backrooms of the warehouse behind the laundromat, which confirmed how that place functioned and what it was used for. But written in red paint on the back wall in block letters, mocking us, were the words: "Sorry Rossi, Peach ain't in this warehouse." Then we were surrounded by Cottero's men. We fought our way out, barely, but we left more of them on the floor than Guardians.

The ransom demands were released, proof of life given. Peach was safe for a time at least. They wanted to strike fear, but they also wanted to get paid.

It was back to square one. We still had our dirt on Cottero, so we released it. And it did just what we intended. In the frenzied in-fighting, the Family got sloppy, revealed assets and cops on the take to anyone who was watching. Toad and I were documenting it all, photos, books, doctored police reports, unsolved murder cases. This time we didn't take it to our Captain or to the Chief. We went directly to the State's Attorney General, a friend of Peach's and a man trying to make a name for rooting out corruption.

Bruno "The Stubborn Don" Caputo of the Tartaruga crime family was brought up on a list of charges longer than Luigi's arm. RICO, yes, but also corruption, embezzlement, breach of contract for city and federal projects. Tying him directly to the criminal enterprise were more difficult, but the charges before him would put him in prison for life, where the other Five Families could easily get to him.

For a taciturn, bull of a man, it didn't take Caputo long to turn State's evidence, and give up Peach. She was being held captive in the Clock Tower building in the DUMBO (Down Under the Manhattan Bridge Overpass). A place not even on our limited radar.

The Guardian Angels were a force now in our own right. Peach's abduction had ignited a fire that wasn't so easily snuffed. We raided the Dumbo with a mix of boys in blue and Angels wearing their red berets.

We found Patricia George, worn and tired, but safe. And so began a partnership that lasted a generation, forming three legs of the stool – honest police, charity and non-profit, and a protection force for both.

Eventually, they made me Superintendent – or Commissioner – but I prefer the old school name. The kids in the hood started calling me "Super" Mario, and while I may be retiring I still got game. And I'm leveling up, I'm watching you.

Epilogue

It's now 2017, and Pa would call me an old man. I did retire from the force, proud to have been part of the NYPD and part of the team that cleaned it up, returned it to a place of honor. I work with Toad to oversee the Guardian Angels he started up back about 15 years ago. We're more of a youth development program now, still funded by George Enterprises. We train young recruits on ethics, ways to protect the vulnerable, mentorship, and athletics. We even expanded into internet-based training. A whole new world for me. That's mostly managed by our next generation of Angels, tech-savvy and working social media.

We still have a small contingent of adult men and women who go into areas with gang activities working closely with the cops and community groups. Luigi expanded Pa's plumbing and repair shop to a service chain, and he manages that now full time. He got out of the Angels when he married his sweetheart Daisy, a beautiful Irish-American girl when they met. Their son Danny is into Formula 1, a fine race car driver. He also makes a living with this crazy stunt-acrobatics called parkour. That boy is like a son to me, and I like to think he got his love of racing from all those hours we spent go-karting and dirt-biking on the weekends.

*It's time to turn things over to another generation of Rossis.*

Glossary of Key Terms and Slang for the Narrative

Italics denote words in Italian
Bold denotes slang commonly associated with the mafia

|	
Boombot:	*an idiot*
Boondoggle:	a wasteful project continued for political reasons
Capo:	a mafia captain controlling 10 footsoldiers
Featherbedding:	padding payrolls on public works projects with fake Union workers to funnel money to the mafia
The Family:	refers to the reigning family in the mob or mafia
Fugazi:	*fake*
The fix is in:	to rig a process to ensure a desired outcome
Goombah:	*comrade; slang usage, a mid-level boss in the mafia*
Ghost payroll:	padding payroll to funnel money to the mafia; broadly applicable form of featherbedding
Mio culo:	*my ass*
Mio figlio:	*my son*
Make his bones:	to rise in rank in the mafia
Mondo Acquatico	*"Water World", the laundromat used by the mob for money laundering*
On the take:	being paid off for work on behalf of mafia
Paesano:	*friend or brother; shortened to paesan' in speech*
Panzagin:	*I'm full.*
Passerotti:	*little sparrows; a term of endearment for a child*
Pigeon:	an informant for the police; stool pigeon
Regno dei Funghi	*"Mushroom Kingdom", the pizzeria Mario frequents*
RICO:	referring to a criminal case brought under the Racketeer Influenced and Corrupt Organizations (RICO) Act of 1970
Shakedown:	extorting money from someone
Smack:	heroin
Wiseguy:	a footsoldier in the mafia; also in common usage to refer to a disliked, arrogant person

SAMPLE OBJECT (BOX) FOR SCALE COMPARISON IN 3DS MAX

BOX = 6- storey building
Length: 24m
Width: 12m
Height: 18m = 3m x 6 floors
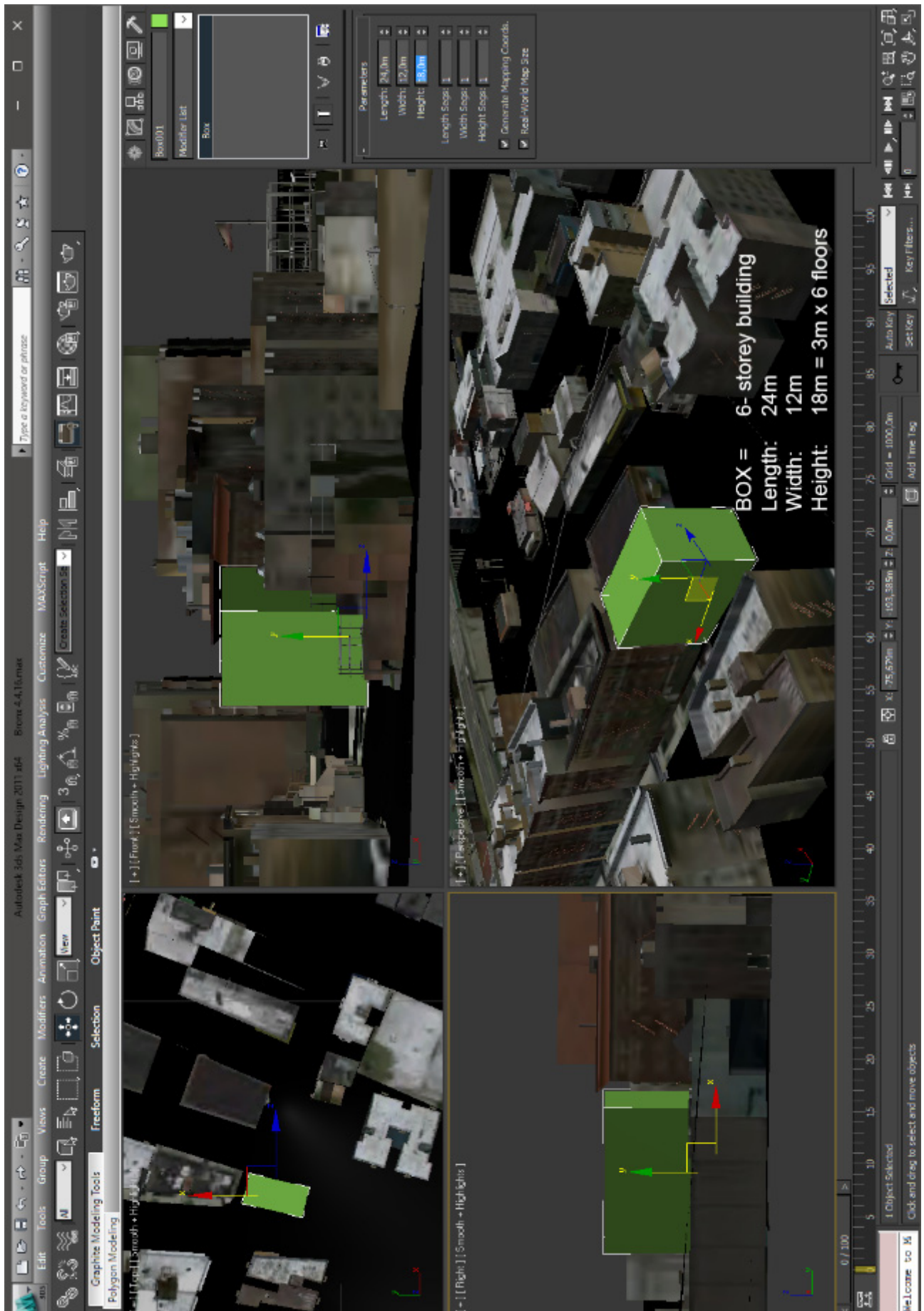
RAPID PROTOTYPE: SCENE 1, VERSION 1 (WARM TONE)
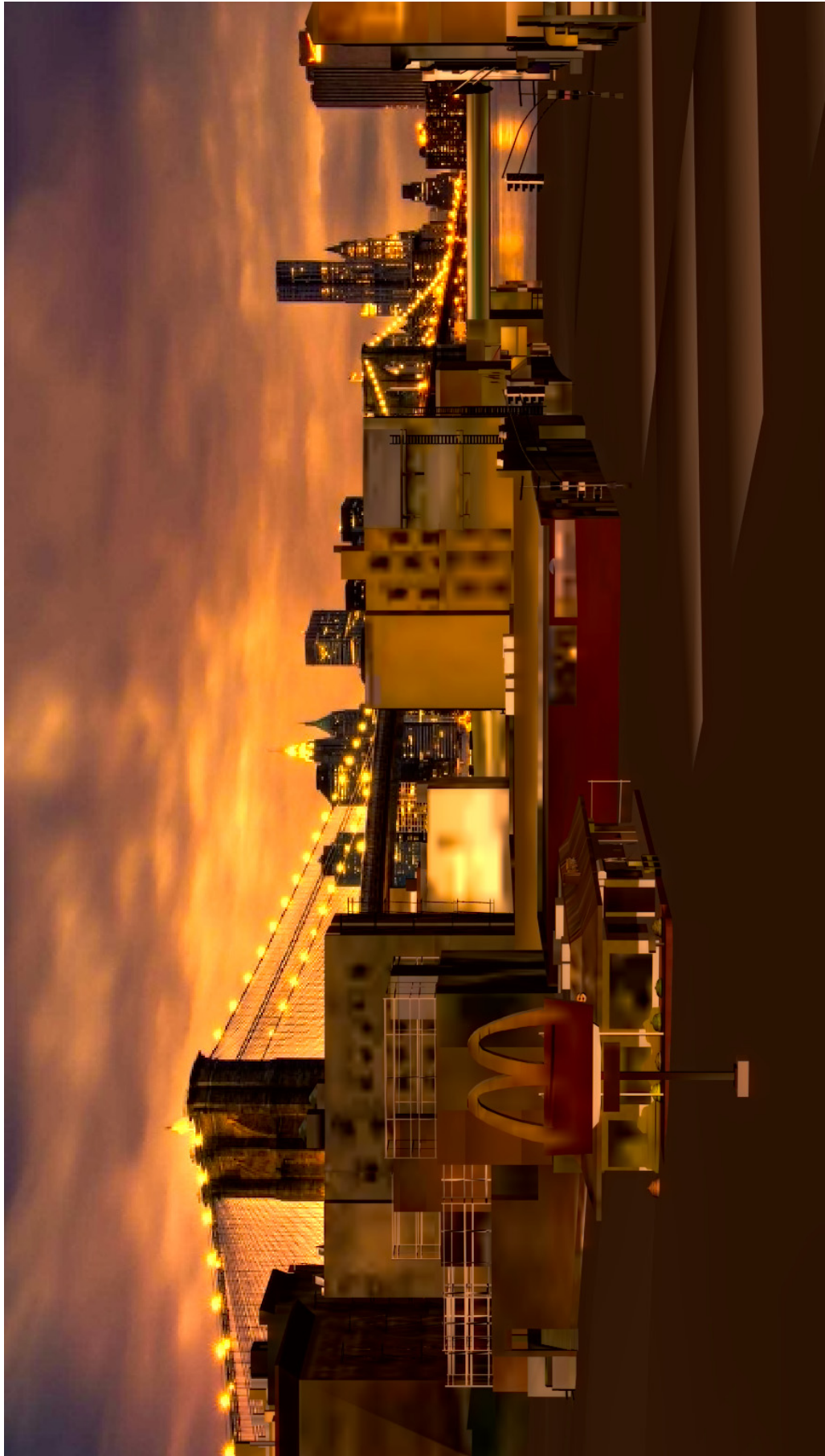
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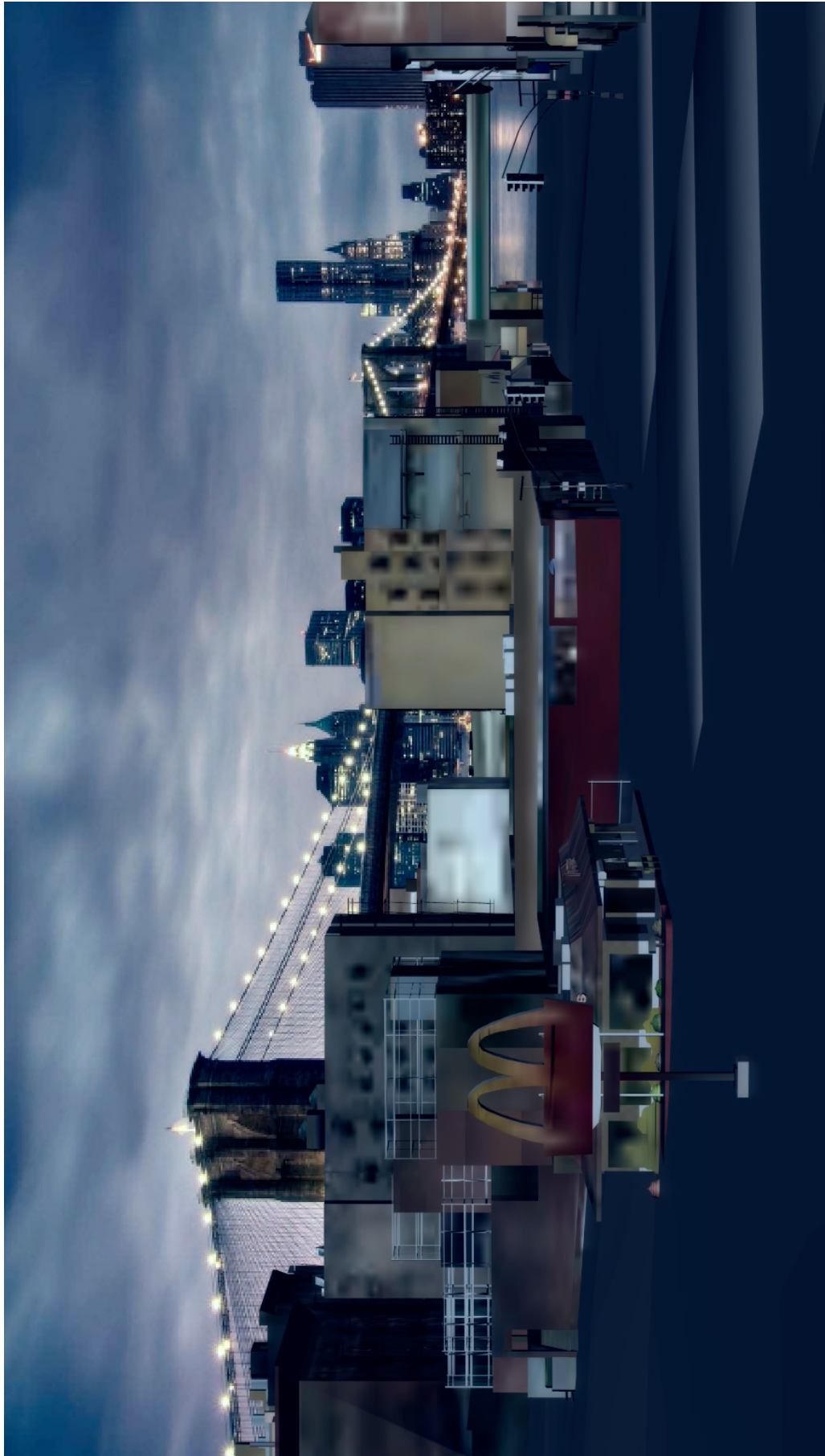
RAPID PROTOTYPE: SCENE 2, VERSION 1 (WARM TONE)

RAPID PROTOTYPE: SCENE 2, VERSION 2 (COOL TONE)