Spring 5-1-2019

Emoji Disorder: Using a Universal Digital Dialect to Enhance Architectural Communication

Doria Miller

Emoji Disorder:
Using a Universal Digital Dialect to Enhance Architectural Communication

A Thesis Submitted in Partial Fulfillment of the
Requirements of the Renée Crown University Honors Program at
Syracuse University

Doria Miller

Candidate for Bachelors of Architecture Degree
and Renée Crown University Honors
Spring 2019

Honors Thesis in Your Major

Thesis Advisor: _____
Gregory Corso, Assistant Professor

Thesis Reader: _____
Jennifer Stromer-Galley, Professor

Honors Director: _____
Dr. Danielle Smith, Director

Abstract

The rise of digital communication has intertwined visual and textual information. As language continually updates to include pictograms, there is potential to update the language of architecture using these visual icons. Emojis are finding their way into our day-to-day vocabulary. In 2015, the word of the year, selected by Oxford Dictionaries, was the 'Face with Tears of Joy' emoji. These amicable emoticons tap into the architectural conversations from *Learning from Las Vegas* of the duck (symbol) and the decorated shed (signage) and themes of iconography as in Somol's *Green Dots 101.* As emojis are not grounded in a specific verbal language and based on a visual interpretation of things, they become universally understood. Designing architecture based on the universal language of emojis creates forms with meanings which are accessible to those outside of the architectural profession.

Executive Summary

Digital communication is catered to our perception of visual information. The introduction of emoji to texts creates a language which becomes enhanced with emotional information. Written messages comprised of only words lack vocal cues and facial expressions, allowing for misinterpretations of information. Emojis provide the non-verbal cues textspeak lacks, allowing for communication which is more empathetic. Though cultural discrepancies do exist in the interpretation of certain emojis, their representation of real objects rather than words which need to be translated allows emojis to be the closest thing we have to a universally understood language. As emojis begin to enhance written communication, this thesis is interested in how emojis can be applied to architecture to update architectural communication.

The widespread use of emojis creates informal conversations laced with a mixture of both words and visuals. Images, particularly those of faces, become quite interesting in relation to communication. When looking at faces, the brain aims to understand and empathize with a given emotion by mimicking a given facial expression. Emojis have been found to be processed as emotional forms of communication the same way facial expressions are decoded by the brain.

Though the use of emojis continues to increase, they become less successful in terms of legibility when they attempt to function as a language by themselves. Sentences comprised of solely emojis are more likely to have misinterpretations as different people associate a combination of symbols in different ways. Rather, emojis are more successful as something which can augment a statement.

In thinking of applying the emoji to architecture, postmodernism must be considered. With the introduction of emoji, Venturi and Scott Brown's duck (architecture which is symbol) and the decorated shed (architecture which is signage) are no longer adequate to communicate in

architecture. The emoji becomes a fusion of the two: a *duckerated* shed. An architecture which communicates through emoji informs its users of the expected emotional reaction to the building function. This is to say a building modeled after a smiling emoji would represent a program which makes one happy such as an ice cream shop.

In existing buildings, faces are often seen through the phenomenon of pareidolia: the psychological phenomenon in which the mind views a stimulus as something familiar. The brain is constantly searching for that which is most recognizable: faces. Due to this, it is not uncommon for people to see faces in existing buildings. A common example would be an archway with a pair of two circle windows horizontally centered above it to form what the brain interprets as a frowning face. In addition to finding faces in buildings, there are a few instances in which architects explicitly design faces as facades of buildings. In these instances, it is for a more purposeful purpose rather than to communicate emotion as this thesis is interested in.

Rather than replacing the existing forms of communication in architecture, emoticonstructs are proposed simply as an additional font to the postmodern language of architecture. As digital communications have changed how we speak and interpret information, communication in architecture should not be ignorant of these changes. As the image and the icon are increasingly used in the spread of information, it becomes even more important for architecture to tap into its communicative potentials. Applying emoji to architecture allows for a graphic immediacy of understanding of built forms. This creates buildings which communicate not only within the discipline of architecture but to everyone living in this digital world.

Table of Contents

Acknowledgements

I would like to take this opportunity to thank my advisor Gregory Corso for his support and guidance throughout the year. A special thank you to Irving Shen, my partner for the architecture thesis and design exploration referenced in this paper, for a memorable year filled with exciting production. I am also greateful to my reader Jennifer Stromer-Galley for her assistance in communications research and her comments on this written thesis. Finally, I wish to express my gratitude to the Renée Crown Honors program for the funding I received for this work and for the opportunities I have had throughout the years in this program.

Introduction

In our consumer society, it is impossible to go a day without being bombarded by symbolic forms of communication. Logos on clothing, processed food products, and online advertisements invade our private lives. Living in a fast-paced world requires an immediate reading of information. The accessibility of digital information caters to our brains' desires to quickly process data. We continue to crave the immediate legibility of symbolic and visual content. As human operations become increasingly digital, communication loses the charisma and emotion provided by facial cues and intonation in face-to-face interactions. As symbols which indicate emotions, emoticons become necessary to enhance our digital conversations. While it is difficult to read intonation and facial expressions in messages of plain text, emojis provide the non-verbal cues missing from textspeak, allowing more effective communication in the digital realm. [1]

Emojis are small picture-symbols which represent a facial expression, object, or symbol. They are widely used in texting and digital platforms to enhance textual information. Though there are some cultural discrepancies among certain emojis, the visual representation of real objects allows emojis to be nearly universally understood. There is no translation needed across verbal languages. Applying emojis to inanimate objects allows these objects to be labeled with a

[1] Vyvan Evans, *Emoji Code* (New York: Picador, 2017), 103.

given emoji and subsequently can be associated with an emotional identity. This thesis is interested in how the emoji can be applied to architecture to create an updated architectural language. By referencing emojis, rather than historical or canonical precedents, those outside of the discipline can better relate to the buildings they inhabit. The first ninety emojis in the Unicode database will be explored as they exhibit facial representations of human emotions. [2] The proposed emoji buildings, or emoticonstructs, will each have a unique emotion referencing the reaction one can expect to have from the building's given program. For example, a candy store would be represented as an excited emoticon as those in the store experience feelings of excitement.

[2] Unicode is the classification of digital characters such as letters or emojis using a series of numbers which is digitally understood by computers and translated to visual symbols.

Chapter 1

Visual Communication

History of Visual Language

The earliest form of visual language dates back 40,000 years ago in the form of cave paintings. These images were painted or carved into stone to depict events, usually featuring animals. As time progressed, these animal forms became simplified and more symbolic. These *ideograms*, or graphic representations of ideas, are equivalent in organization to modern *logographics*, which act as useful signage in spaces such as international transit hubs where a country's main language may not be significant to convey information. Ideograms include Egyptian hieroglyphics and Chinese calligraphy. Eventually, these ideogram-based alphabets advanced. Rather than representing the animal or object in which they signify, the 'word' produced for the symbols was simplified to the beginning sound of the expression - Bison became 'b', so to speak. As the physical drawings of these symbols continued to evolve, the ideograms developed into the Greek alphabet around 2000 BC and later the modern Roman alphabet in the early 100's AD.[3] The following diagram shows this growth from symbol to

[3] Marcel Danesi, *From Cave Drawings to Emojis* (TEDx Talks, 2016).

alphabet as described in a TED talk with Marcel Danesi, a professor of semiotics and linguistic anthropology at the University of Toronto.

Figure 1- Evolution of Written Language

While computer-mediated communication initially consisted of primarily text, contemporary digital communication includes both the pictogram and the alphabet. In an increasingly digital world, information is rapidly exchanged, and visuals are easily produced and shared. Digital technologies allow communication to be expected to include a fusion of visual and textual information. The more time we spend on digital platforms the lower our attention spans become and the need for a fast means of communication increases. An attention span study by Microsoft Canada in 2015 found the average human attention span dropped from twelve seconds at the start of the century to eight seconds in 2013. The average attention span of a goldfish is nine seconds. Microsoft conducted studies tracking participants brain activity and behavior as they interacted with different media and performed various activities across devices and in new settings. The studies highlight media consumption, social media use, technology adoption rate, and multi-screen behavior as the top factors which impact attention span.[4]

[4] Microsoft Corporation, *Microsoft Attention Spans Research Report* (Spring 2015).

There are disagreements as to whether the accessibility of visual forms of communication affects attention spans. Alternate studies suggest the decreasing attention span of humans is related to diet rather than digital stimuli. In naturally treating attention deficit hyperactivity disorder, some swear by the Feingold diet which cuts artificial ingredients, certain food preservatives, and salicylates (certain chemicals found in plants) from one's diet.[5] in the realm of visual-literacy education argue a more visually oriented educational system would result in cognitive benefits and new mental tools with which to understand the physical and social environment. The image is another way to understand reality, much like language. [6]

Face-to-face communication has qualities which the written word does not: facial expressions and intonation. A study by Psychologyist Albert Mehrabian completed in the 70's suggests verbal information is understood 53% from facial cues, 38% from voice tone, and only 7% from the actual words spoken.[7] This poses an issue with the interpretation of the written word. Without facial cues and tone of speech, sentences on a page become less effective than words exchanged in person. In the digital world, the emoji, specifically those which represent given emotions with the representation of a face, becomes close the gaps of misunderstanding between verbal and written conversations.

Emoji

The widespread use of the emoji creates informal conversations in the form of texts and tweets laced with both words and symbols. The term 'emoji' in Japanese translates to 'picture

[5] Laura J Stevens, Thomas Kuczek, John R. Burgess, Elizabeth Hurt, and L. Eugene Arnold. "Dietary Sensitivities and ADHD Symptoms." *Clinical Pediatrics* 50, no. 4 (April 2011).
[6] Paul Messaris, *Visual "Literacy"* (Boulder, CO: Westview Press, 2009).
[7] Albert Mehrabian, *Nonverbal Communication* (Chicago, IL: Aldine-Atherton, 1972).

character' when broken down (e + moji). Its resemblance to the English words *emoticon* and *emotion* are coincidental, though many confuse the two to be related. Emojis were the result of typed emoticons [so things like :) or ^_^] as well as various graphical representations around Japan. The initial set of emoji was created for Japanese phone provider DoCoMo's mobile platform. This original set has recently been acquired by the MoMA. [8] Digitally, emojis are read as Unicode characters. Unicode is the digital format in which computers read any given character across platforms. Every letter, number, or symbol in a font or language is given a unique number of which computers translate to the visual representation we are able to understand. When we see 😊, the computer reads "U+1F60A"; 'a' is read as "U+0061".[9] Without Unicode, characters on an Apple device would read differently from characters on an Android device and so forth.

In 2015, Oxford Dictionaries Word of the Year was the 'Face with Tears of Joy' emoji: 😂.[10] This was particularly significant in the progression of language. Not only was the chosen word a pictogram, but one of the most prestigious dictionaries in the world chose it. The way in which we communicate is evolving to include both pictogram and text. While written language is concerned with a semantic interpretation of words, emojis have a semiotic reading. Semantics is the meaning and logic of words and their relationship to other words. Semiotics is the understanding of symbols. When the two are mixed, the interpretation of a given text is enhanced. When people communicate face-to-face, they understand and demonstration empathy as they subconsciously mimic facial expressions.[11] This phenomenon in which another's

[8] Paul Galloway, "The Original Emoji Set…," *MoMA* (2016).
[9] "Unicode Consortium," www.unicode.org.
[10] "Word of the Year 2015," *Oxford Dictionarie* (2015).
[11] Marianne Sonnby-Borgström, "Automatic Mimicry Reactions as Related to Differences in Emotional Empathy," *Scandinavian Journal of Psychology* (2008).

emotions trigger similar emotions in an individual is called emotional contagion. The increased use of face emojis in digital conversations have been shown to elicit emotional contagion. Studies have shown the same parts of the brain are activated when looking at a given smiley face as when looking at a human face.[12] Our brains are not programmed to understand emojis in this way, but rather we have become conditioned to understand them the same way we would another human being. In comparing messages containing emojis to those without, recipients are likely to be more honest and generous in their replies when emoji characters are used.[13] Emojis are processed as emotional forms of communication the same way other non-verbal cues are decoded when having a verbal conversation with another person. As emojis are based on defined objects and expression they lack translation barriers. This makes their characters universally understood and their meaning is instantly interpreted.

Though emojis are becoming increasingly widespread, they become less successful as a universal form of communication when they attempt to work as their own language. In order for emoji 'sentences' to be understood, they must be grounded in a base language. Typing solely with emojis is considered 'substitutive text'.[14] Certain words would be formed of compound emojis, for example, puppy love = 🐶 ♡. In *Pride and Prejudice & Emojis*, the classic novel is translated into an emoji equivalent of the story. Without the textual reference, the emoji phrases become confusing and nearly illegible.

---

[12] Owen Churches, Mike Nicholls, Myra Thiessen, Mark Kohler & Hannah Keage, "Emoticons in Mind," *Social Neuroscience* 9:2 (2014).
[13] Alexis M. Elder, "What Words Can't Say: Emoji and Other Non-Verbal Elements of Technologically Mediated Communication," *Friendship, Robots, and Social Media* (Routledge, 2018, pp.178-193).
[14] Marcel Danesi, *The Semiotics of Emoji* (Bloomsbury Academic, London, 2017).

Figure 2 - Excerpt from 'Pride and Prejudice & Emoji

A book written entirely in symbols, *Book from the Ground: From Point to Point* follows the day in the life of an office worker, a story told without any words. The entire book, front, back, and publisher information, is represented as symbols. It is meant to be a book that anyone can understand yet attempting to read it takes a long time and often there are misinterpretations from one person's perception of events to another's. In order for symbols to enhance written communication they need to be included with words rather than without them.

Instead, emojis are more effective at conveying meaning when they are used in tandem with words. The interaction between the iconic emoji and the syntax of the sentence structure is an effective way of writing. The combination of pictures and words requires a hybrid of understanding. The visual images intertwine with the words to result in an enhanced understanding of the conversation.[15]

[15] Marcel Danesi, *The Semiotics of Emoji* (Bloomsbury Academic, London, 2017).

Chapter 2:

Symbols in Architecture

The Duck and the Decorated Shed

Post-Modernism in the discipline of architecture is any built form which communicates with the public and the architects. The most useful way architecture can communicate to passersby is by providing information on what is housed within a building. In *Learning from Las Vegas*, Robert Venturi, Denise Scott Brown, and Steven Izenour define two main categories in which a building can communicate its program to individuals: the duck and the decorated shed. The 'duck' refers to any building which *is* a symbol. The building program, architectural space, and structure are unified. Termed 'duck' after a duck-shaped drive-in in Long Island, ducks in architecture are understood with semiotics, or graphics. The 'decorated shed' is considered any 'ugly' or 'ordinary' shelter with large signage.[16] These buildings with textual information communicate through semantic understanding.

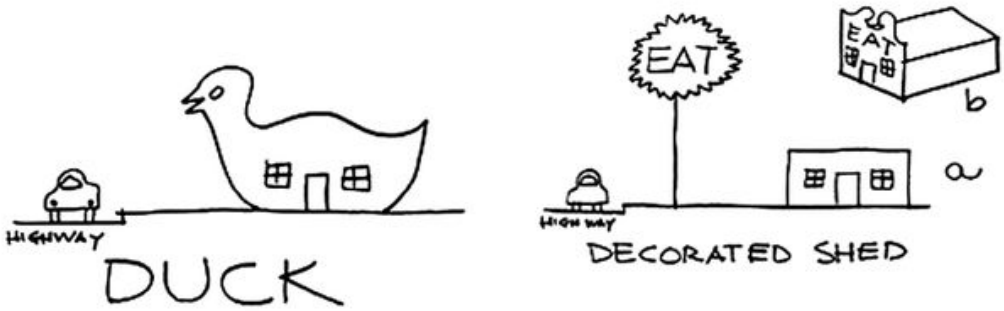

Figure 3 - Duck and Decorated Shed

[16] Robert Venturi, Denise Scott Brown, and Steven Izenour, *Learning from Las Vegas* (Cambridge, MA: MIT Press, 1988), 88.

In a recent article by Joanna Grant in Yale's architectural journal, *Paprika!*, "Emoji: Image, Meaning, Form", she argues the following:

> *"The language of emoji applies the decorated shed to the duck: another layer of language is encoded onto a form, one of image and form and the other of linguistic meaning."*[17]

As emoji are both language and symbol, they would not fit into either the duck or decorated shed category. When introducing emoji to architecture, the duck and the decorated shed are no longer adequate to project meaning onto architecture. The symbolic language of emojis calls for a hybrid model: the *duck*erated shed.

Form and Logo

In *Green Dots 101*, Somol argues for a new approach to architectural justification within the discipline. He examines four early vectors of architectural design practices: articulation, notation, decoration, and figuration. This thesis is interested in the latter two. Decoration is associated with the decorated shed while figuration relates to John Hejduk's exploration of characters in architecture. [18] Decoration and figure emphasize the message or content of

[17] Joanna Grant, "Emoji: Image, Meaning, Form," *Paprika!* (October 2018).
[18] 'Characters' in this sense refers to the object's resemblance to another being as opposed to characters such as letters.

architecture over formal design qualifications. In these instances, surfaces and elemental properties of the design are emphasized.[19]

As the digital age has impacted language, it has also impacted architecture. Digital representation and modeling techniques opened doors to curvilinear, non-uniform lines and surfaces. Projects of parametric digital intricacy, such as with *blobitecture,*[20] or essentially architecture which looks like blobs, produce a visual form that has graphic expediency and is read as a logo. Logos in architecture produce a fast, fun, graphic understanding of the image of architecture. This allows for built forms to connect with a larger audience than strictly with the discipline.[21]

Faces in Architecture

The overlooked ordinary and everyday building programs may be engaged more by passersby through the process of superimposing what is already familiar onto the discipline of architecture. Emojis are a universally understood form of communication and thus become the most recognizable form of symbolism. Applying emojis to architecture allows for a graphic immediacy of understanding. In existing conditions, one can almost see emojis in buildings through pareidolia. This phenomenon is the perception of apparently significant patterns or recognizable images, usually faces, in random or accidental arrangements of shapes and lines. Seeing faces where they are not was initially associated with mannerist paintings, in which

[19] Robert Somol, "Green Dots 101." *Hunch* 7, no. 11 (Winter 2007): 30.
[20] A movement in the age of digital architecture in which buildings are designed as blobs; an interest in the capabilities of digital design and fabrication.
[21] Robert Somol, "Green Dots 101." *Hunch* 7, no. 11 (Winter 2007): 34.

realistically proportionate faces are depicted of alternate objects. Today, the widespread use of emojis adds them to the visual vocabulary of images the eye searches for.

Considering pareidolia through the lens of emojis allows for abstracted building forms to be read as simplified faces. A simple image search of 'pareidolia building' on google reveals how often architecture is interpreted as faces. While one can see faces in architecture with this phenomenon, there are more intentionally designed architectural works that represent faces. The Face House by Yamashita Kazumasa in Kyoto, Japan is a house for a graphic design couple. The graphic legibility of the house cooresponds with the inhabitants' profession. Its strong symbolic nature livens up its drab context and acts as a point of tourism for an otherwise average area.[22] Charles Jencks suggests of this architecture, "By mapping the forms so literally, the metaphor becomes reductive: 'home' it says, 'is nothing but an inscrutable face'."[23]

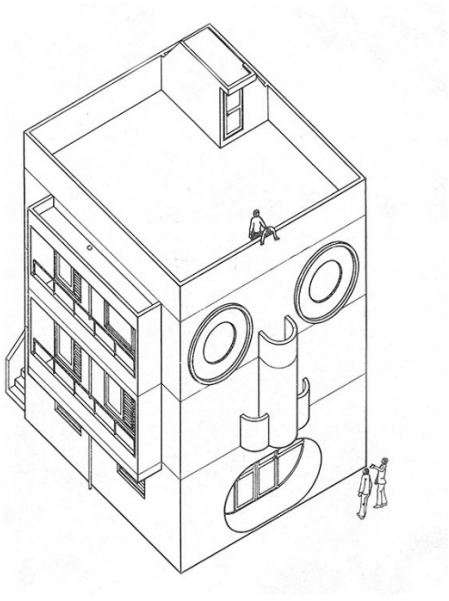

Figure 4 – Face House

Figure 5 – Emoticon Façade

[22] "Face House in Kyoto," *Architectural Review* (2015).
[23] Charles Jencks, *The New Paradigm in Architecture: The Language of Post-Modernism* (New Haven, CT: Yale University Press, 2002).

In a built attempt to introduce emoji to the architectural discipline, a mixed-use building in the Netherlands (Figure 5) designed by Attika Architekten applies emoji as motif to embellish an otherwise plain building. Rather than placing sculptures of historically important individuals as ornamentation, as seen throughout history, the ornamentation references the face emojis from popular culture.[24] While this is a direct example of emoji applied to architecture, it limits the discourse between architecture and emoji. Here, emoji is simply ornament while this design portion of this thesis is interested in how the emoji can become architectural form.

[24] Rory Stott, "In Defense of the Emoji Building and Architecture Being Fun, Sometimes," *ArchDaily* (July 2017).

Chapter 3:

Exploration: Emoticonstructs

As the duck and the decorated shed were coined for public, commercial programs, this new typology of emoji-architecture has been explored as buildings with public programs to meet the needs of a given community. From the emoji categories of the Unicode, the face emojis were chosen for their proven success at communicating emotions. The term ‘emoticonstruct’ has been created and used in reference to this explored emoji architecture. The playful reinterpretation and reorganization of building elements and forms to create these recognizable figures references popular culture rather than architectural precedents, creating architecture in our built environment which is more amicable and approachable to those without an architectural background. Rather than replacing and taking over existing forms of communication through architectural form, these emoticonstructs will allow another means of communicating through the built environment.

Emoticonstructs are read as logos. They communicate without an alphabet, but rather through a language of graphic understanding through their emotional reaction of empathy. The program of an emoticonstruct triggers an emotional response which resonates with its emoticonstruct identity. For example, a building based on the ‘sleeping face’ emoji would be realized as a hotel. To counter the mantra of modernism, “form follows function,”

emoticonstructs are designed such that function follows the feeling of the form. Due to the highly visual importance of the constructs, the visibility of these buildings is an important factor in determining their orientation and placement within a given context. The locations in which the buildings are placed in relationship to surrounding buildings enhances and alters an existing narrative.

To balance the tongue-in-cheek quality of the project, a physical context is needed to act as a testing ground to create friction and enhance the comprehension of the designs. Roosevelt Island, located on the East River between Manhattan and Queens, is 2 miles long and only 800 feet wide. The island features a walking trail on its periphery and a single main street through its middle. It is highly visible from the waterfronts on either the Manhattan and Queens sides, allowing the emoticonstructs to be easily seen and understood. Looking back in history, the island was once a place for undesirables. The emotionally disordered and criminals found homes in the insane asylum and penitentiary which once stood on the island. It wasn't until the 21st century, after these disturbing buildings were no longer in service, that the island became more gentrified. The island is part of Manhattan in zoning, but it is nothing like it with many open spaces. In terms of visitation, a tram goes to the island, offering views of the city skyline. Additionally, FDR Four Freedoms Park encourages tourism to the island. Other than these minimal attractions, the island lacks tourist appeal. The history and the status quo of Roosevelt Island result in a nonuniform identity, though the island has great potential and visibility. In 2017, part of the new campus for Cornell Tech was completed and the island is under continuing development. Choosing Roosevelt Island as a testing ground for placement of these emoticonstructs allows for a uniform sense of identity to be given to the island.

The iconography of the playful buildings will encourage tourism and increased activity to the site. Their fast, graphic readability will make them highly communicative forms of architecture. Though this project was inspired from pareidolia, which is unintentional, the emoticonstructs will function with intentional symbolic recognition, placing identifiable emoji faces in the physical world where they are unexpected.

Conclusion

The rise of visual language in digital communication has changed the way in which we speak and interpret information so why shouldn't it change the way in which we design and understand architecture? In order for architecture to progress, it must not be ignorant of the changes in language trends. As the image and the icon become increasingly a part of the spread of information it becomes even more important for architecture to tap into its communicative possibilities. The duck and the decorated shed fit into the existing discourse, but they are outdated as the digitization of architectural creation has created new possibilities for architectural design.

An emoji architecture becomes a *duck*erated shed by design. Neither purely symbol or signage, emojis are a fusion of the two. An updated architectural language can be translated from the existing context of emoji and reflect its pragmatics and characteristics. Applying emoji to architecture allows for a graphic immediacy of understanding of built forms. With architectural references to popular culture rather than to the profession, those outside of the realm of architecture have more access to the semiotics of design.

Works Cited

Danesi, Marcel. “From cave drawings to emojis: Communication comes full circle.” *TEDx Talks*. October 27, 2016.

Danesi, Marcel. *The Semiotics of Emoji: The Rise of Visual Language in the Age of the Internet*. London, UK: Bloomsbury Academic, an Imprint of Bloomsbury Publishing Plc, 2017.

Elder, Alexis M. “What Words Can’t Say: Emoji and Other Non-Verbal Elements of Technologically Mediated Communication.” *Friendship, Robots, and Social Media: False Friends and Second Selves.* Routledge, 2018, pp. 178-193.

Evans, Vyvyan. *Emoji Code: The Linguistics Behind Smiley Faces and Scaredy Cats*. New York, NY: Picador, 2017.

"Face House in Kyoto, Japan by Kazumasa Yamashita." *Architectural Review*, June 23, 2015. June 23, 2015. doi:10.11129/detail.9783955531676.110.

Galloway, Paul. "The Original Emoji Set Has Been Added to The Museum of Modern Art's Collection." MoMA. October 26, 2016.

Grant, Joanna. "Emoji: Image, Meaning, Form." *Paprika!*, October 11, 2018. October 11, 2018.

Jencks, Charles. *The New Paradigm in Architecture: The Language of Postmodernism*. New Haven, CT: Yale University Press, 2002.

Mehrabian, Albert. *Nonverbal Communication.* Chicago, IL: Aldine-Atherton, 1972.

Messaris, Paul. *Visual "Literacy": Image, Mind, and Reality*. Boulder, CO: Westview Press, 2009.

Microsoft Corporation (2015). *Microsoft Attention Spans Research Report*. Canada: Microsoft Corporation.

Owen Churches, Mike Nicholls, Myra Thiessen, Mark Kohler & Hannah Keage (2014) *Emoticons in Mind: An Event-Related Potential Study*, Social Neuroscience, 9:2, 196-202.

Somol, Robert E., "Green Dots 101." *Hunch* 7, no. 11 (Winter 2007): 28-37.

Sonnby-Borgström, Marianne, “Automatic Mimicry Reactions as Related to Differences in Emotional Empathy.” *Scandinavian Journal of Psychology*, June 28, 2008.

Stevens, Laura J., Thomas Kuczek, John R. Burgess, Elizabeth Hurt, and L. Eugene Arnold. “Dietary Sensitivities and ADHD Symptoms: Thirty-Five Years of Research.” *Clinical Pediatrics* 50, no. 4 (April 2011): 279–93.

Stott, Rory. "In Defense of the Emoji Building and Architecture Being Fun, dSometimes." *ArchDaily*, July 27, 2017.

"Unicode Consortium." *Unicode*. February 8, 2019.

Venturi, Robert, Denise Scott Brown, and Steven Izenour. *Learning from Las Vegas*. Cambridge, MA: MIT Press, 1988.

"Word of the Year 2015." Oxford Dictionaries, English. 2015.

Xu, Bing. *Book from the Ground: From Point to Point*. Cambridge, MA: MIT Press, 2014.

Figures

Appendices

**The following are from the architure thesis "Emoji Disorder" completed by myself and Irving Shen.*

Image Archive – Pareidolia

Seeing Emojis