This book is dedicated to Syria, the cradle of civilization, the birthplace of the damask rose, the crossroads of many religions, and the land of my roots. It is dedicated to Amal, Abdul, Yamen and all the Syrians affected by this tragedy. It is dedicated to all refugees around the world.
To my beautiful mom who always taught me to see the good in everyone and everything—even if it was hard to find.

To my loving dad who always taught me as a child to never leave the house with snacks unless I had enough to share with all my friends.

And, to my husband, my best friend, whose love taught me how to live life in full color, and who always knows how to make me laugh the loudest.
Outsiders, Everywhere

Humanizing Syrian Refugee Visualizations

Humanizing the information visualization which come out of humanitarian crisis applied to the Syrian conflict

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Pedro Cruz
Ernesto Aparicio
Abstract of Thesis

The Syrian conflict is the worst humanitarian crisis of modern history. But, with that reputation, the information visualizations representing this crisis have been accompanied with a voice that tends to be a more inhumane and neutral one.

The representations are often done using graphic languages that are used to display statistical and quantitative information. This turns human elements, emotions, and struggles to bar charts and bubble charts which, in return, dehumanizes their struggles.

The visualizations of this thesis humanize the representation of the Syrian conflict by focusing on individual refugee journeys. Every single one of those millions of Syrian refugees has an experience filled with struggle that they carry along side them on this treacherous journey. By centering on the point of view of one refuge at a time, the visualizations will be more humanized, and, in return, is more impactful than any statistical graph or chart. The Syrian crisis is specifically addressed. Ultimately, however, an awareness for the worldwide refugee crisis will evolve by proxy.
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Chapter I: Leaving Syria

Chapter II: The Mediterranean: The Gateway to Europe

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Finally
Introduction
Humanizing Information Visualizations that Represent a Humanitarian Crisis

Designing for Advocacy

“Design is usability. It is Information Architecture. It is Accessibility.”

Design is an unsung hero. Design is not typically the word most people think of when asked about social change or advocating for a cause in this world. They might think of organized protests, community services, building homes, or any other image of the great work people contribute their time, effort and money to. However, design is often the force that drives all of that to work and makes it happen. Design comes in various forms that could be tangible or explicit to someone who isn’t in the design field, like the poster that motivates, the infographic that lays-out the facts of the situations, the interactive visualization that visually describes the magnitude of a tragic event. But, Mark Boulton, professional web designer, sheds some light on the other side of design, which is more subliminal, by saying, “Design covers so much more than the aesthetic. Design is fundamentally more. Design is usability. It is Information Architecture. It is Accessibility. This is all design.” Designing the process of movements, organizing the information and thoughts and turning them into action, and so much more are all included in the realm of design and its effective power to drive change.
Design is often the vehicle in which visual communication takes place, and it comes in so many different forms and is much more than a color scheme or a typeface. There are different types of design, and Information design is a genre that has great importance in creating advocacy and driving change. Often, when a certain topic is visualized with accurate information it helps people understand, draw patterns and conclusions to a certain issue. Visualizing information tends to transform complex data-sets or blocks of texts, to understandable and easier to read information, and in the area of social change and advocacy, it can also increase awareness of a complicated situation, and motivate outcomes.

Observing and researching massive waves of immigration has been the focus of many journals and articles throughout history. Many people have written pieces about the subject, and in recent days, the Syrian conflict has been in the center of a storm of press. Nonetheless, when it comes to visualizations, the visual representations that exists currently mostly function as supportive material alongside news articles or stories. They help expand on a certain point. These visualizations, about immigration and refugee waves, often employ graphs that are frequently used to represent statistical information that only provides a blanket overview of the situation, which leads to a dehumanized representation of this humanitarian crisis.

The visualizations of this thesis will humanize the representation of the Syrian conflict by focusing on individual refugee journeys. Every single one of those millions of Syrian refugees has an experience filled with struggle that they carry along side them on this treacherous journey. By centering on the point of view of one refugee at a time, the visualizations will be more humanized, and, in return, is more impactful than any statistical graph or chart. While the Syrian crisis is specifically addressed, an awareness for the worldwide refugee crisis will evolve by proxy.
Immigration

A Dense History

“Do you know what a foreign accent is? It’s a sign of bravery.”
–Amy Chua, Battle Hymn of the Tiger Mother

Immigration is a worldwide phenomena as old as time. Since the beginning of human life on Earth, groups of people, nomads, emigrated from one point to another looking for water sources, food, and a better life for their families. Seeking a more suitable life has always been a human survival instinct. But, with the creation of governments and borders, this relocation process has become much more difficult and political. There are many factors, in our modern times, that force people to migrate to different parts of the world. Those reasons could be financial, political, social, and even environmental. Yet, political motives for immigration are usually tricky since there tends to be many players, mainly political figures, influencing the admission or rejection of the refugees. Those policies directly impact the decision of destination those refugees take, and whether or not they are willing to take a risk and illegally enter a country that rejected their arrival. Political policies are also very fluid, and are prone to change, which adds to the murkiness of the situation. Human immigration is a rich subject with many unfortunate examples, like the hundreds of thousands that fled Somalia to Kenya after a civil war in the early 90s, the millions that were displaced due to civil wars in Central America in the 80s, the 8 million Jews fleeing the holocaust, and the big waves of immigration that happened after both World Wars all around the world, to name a few.
1900s

1920
Syria becomes under the control of France.

1916
Sykes–Picot Agreement post WWI secretly drafted. Syria was drawn on a map.

1900
Syrian territory was under the Ottoman Empire rule.

1900s 1940s 1950s 1960s 1970s

1944
Syria finally got its independance.

1946
French troops left.

1948
Syria got involved in the Arab-Israeli War.

1949
Military gained power post WWII through coup.

1958
Egypt and Syria merged as United Arab Republic.

1956
Signed an agreement with the Soviet Union, allowing Communist involvement in the government for military equipment backing.

1961
Syria broke ties and became the Syrian Arab Republic.

Most of the 60s were characterized by frequent military coups.

1970
Minister of Defense, Hafez Al Assad, seized power after a bloodless coup.

1976
Syria occupied Lebanon until 2005.
In this timeline I give a brief overview of recent political events throughout history that shaped how Syria is today.

### Syria’s Recent Historical Timeline

<table>
<thead>
<tr>
<th>1982</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hama Massacre.</td>
<td>USA posts its first ambassador in five years.</td>
</tr>
<tr>
<td>10,000–40,000 deaths.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1980</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tadmor Prison Massacre.</td>
<td>Hafez Al Assad Dies.</td>
</tr>
<tr>
<td>1,000 deaths.</td>
<td>His son, Bashar Al Assad, 34, became his successor.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1980</th>
<th>2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siege of Aleppo, where the Al-Masharqah Massacre happened along with others.</td>
<td>Syrian Parliament changed the mandatory minimum age of the President from 40. He won by a 97.3% vote lead.</td>
</tr>
<tr>
<td>4,000 deaths.</td>
<td>600 political prisoners released.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1990</th>
<th>2009s</th>
</tr>
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<tbody>
<tr>
<td>Syria joined the US-led coalition against Iraq.</td>
<td></td>
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<tr>
<th>2010s</th>
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<tbody>
<tr>
<td>2010</td>
</tr>
<tr>
<td>USA put economic sanctions against Syria, accusing it of supporting terrorist groups like (Hamas and Hezbollah).</td>
</tr>
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</table>

### THE SYRIAN CONFLICT BEGINS
2011
peaceful protest ignited met with a very bloody response.

<table>
<thead>
<tr>
<th>2012</th>
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<tbody>
<tr>
<td>Syria became the center of the biggest tragedy in recent history.</td>
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</table>

<table>
<thead>
<tr>
<th>2015</th>
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<tbody>
<tr>
<td>The worst humanitarian crisis since WWII.</td>
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</table>
On March 2011, a rare uprising started to form and simmer within Syria, a Muslim–Sunni majority country, in a city called Daraa. The Syrian government had such a strong hold on its citizens, the general public was surprised, as many did not see the uprising happening. Syrians were still remembering the events that took place in Aleppo thirty years prior to these events. In 1980, on the morning of Eid Al Fiter, the Muslim holiday and equivalent of Christmas, Hafez Al Assad, the former president of Syria and the current president Bashar Al Assad’s late father, and his armed forces were responsible for the Al-Masharqah Massacre. That massacre killed 100 Syrians for apposing government policies. Syria’s current government has a very prominent history of cracking down on anyone who questions it, using an intense network of secret security forces, “Mokhabarat.” The numerous examples throughout recent history of the Assad regime employing this deep-rooted network of Mokhabarat to demolish and halt any apposing action, protests, or even ideas from its citizens, killing thousands, was one of the main reasons Tunisia, Libya, and Egypt had a head start in what was called later “The Arab Spring.”
In the beginning of the revolution, Syrian citizens were initially asking to “reform” a few of the government’s existing policies. Some of which were economic that had to do with high unemployment rates and poverty. Other demands asked the demolition of the emergency law, this law gave the government authority to detain any person without prior warning if suspected to affect public or national security for as long as needed. Unfortunately, after a bloody response from Bashar Al Assad and his armed forces, it turned into a more serious uprising. Syrians started to chant and demand an “overthrow” and removal of Bashar Al Assad, the ruling family, along with their ruling party, Ba’ath.

Events got bloodier once outside players started to get involved with internal affairs of Syria. Russia, along with Iran and Lebanon’s Shia group Hezbollah started to back and support the Assad Regime. While the United States and some of the Gulf countries, like Qatar and Saudi Arabia, started to arm the apposing forces turning the situation into a proxy war. During which, outside rebel armed forces that were mainly birthed from the Iraq War started to make their way and trickle into Syria. This only made matters worse. In mid 2012, Syria became the center of the biggest tragedy in recent history. According to the UN, almost 13.5 million Syrians need humanitarian assistance. The way things are headed, with more than 400,000 deaths and 4 million refugees since April 2016, the Syrian crisis will be remembered as the worst humanitarian crisis since WWII.

With the rise of the violent episodes, many people began to look elsewhere to relocate the remains of their lives. Millions of refugees started to move out towards neighboring countries like Egypt, Turkey, Lebanon, and others in North Africa. Syrians were under the impression the conflict would end sooner
Syria’s civil war has been a continuous escalated violent episode with no end in sight. On a daily basis, innocent civilians continue to be casualties in the crossfires. In this graph, I illustrate the number of deaths per week, since the ignition of the crisis in 2011, until May 2016, while juxtaposing the peak number of death, with the events that were occurring on the grounds of Syria meanwhile.

rather than later, and they would soon return to the homes and lives they once knew. But, with the rapid escalation of violence, due to Al Assad’s armed forces and outside influences, Syrians were forced to find a more “permanent” relocation in further destinations. European countries, for example, started to become an option, and especially countries that are part of the European Union, since internal boarders were removed and the open-border idea was adapted, as an aftermath to the Schengen agreement, allowing a freer movement. But, the increase in violence definitely correlated with an increase of difficulties for the immigrants to seek asylum and acceptance into European countries.
“Refugees don’t just experience violence in their home countries; they are also almost universally victimized while they flee,” Jason Cone, executive director of Doctors Without Borders. The general perception is that the struggles refugees face seem to end as soon as they arrive to their final destination. This is a big misconception, because while they have lived through the horrors in their home, and the troubles of the journey, arriving to their “safe haven” is where and when a whole new set of obstacles emerge. The pressure of starting a new life in a foreign country where they might not speak the language, facing discrimination from citizens opposing their arrival—which sometimes translates to attacks, fear of deportation at any point, and so much more. Doctors Without Borders estimates that once refugees flee, they are displaced on average for 17 years.

“They [refugees] are also almost universally victimized while they flee”
Syria refugees in neighboring countries
4,957,907

Turkey
2,800,000

Lebanon
1,011,366

Jordan
656,170

Iraq
233,224

Egypt
117,591

North Africa
29,000
In this graph, I illustrate the number of refugees, collected from the UNHCR by the end of 2016, that leave Syria to its neighboring countries first, then a fraction heads to different European nations seeking asylum. The width of the lines are an accurate representation of the refugee distribution.

Syria’s refugee waves

Syrian refugees continuing to Europe
884,461

Germany
456,023

Sweden
109,976

France

Hungary

Italy

Austria

UK

Belgium

Switzerland

Netherlands

Norway

Poland

Denmark

Greece

Finland

Bulgaria

Spain

Malta

Luxembourg

Cyprus

Romania

Ireland

Czech Republic

Portugal

Lithuania

Slovakia

Croatia

Slovenia

Latvia

Iceland

Estonia

Liechtenstein

Other
State of the Crisis
As the brutality and the rising numbers of fatalities increased, resulting in many Syrians fleeing their country seeking refuge, this crisis has been dominating conversations across the world. It has been discussed by politicians, presidential candidates, NGOs (Non Governmental Organizations), humanitarian aids, news outlets internationally, and many various big and small scale conversations.

Amnesty International calls it, “The worst humanitarian crisis of our time.” The New York Times says, “[The current situation] never seems to change: It frustrates any attempt at resolution.” Syria has also been a hot topic during the 2016 United States presidential election race, where Donald Trump, the Republican nominee who won and became the president, referred to the refugees as a ‘Trojan Horse’ when he was campaigning. His aim was to make it hard to accept refugees into the United States. Hilary Clinton, the Democratic nominee, on the other hand, had a very different view on the matter saying, “We have always welcomed immigrants and refugees,” Clinton also added, “we have made people feel that if they did their part, they sent their kids to school, they worked hard, there would be a place for them in America.” This crisis has been in the center of conversations worldwide. With conversations, in this day and age with all the advanced technological capabilities, come visualizations and different forms of storytelling.
Grouping the information visualizations, that act as a tool to explain or represent the Syrian crisis, into main categories

There has been endless hours of reporting on the Syrian crisis, but, when it comes to information visualizations on this topic, there has been sort of a limited pallet of representations. These representations are mainly, but not exclusively, found in news outlets, and in humanitarian aid organizations. I have grouped those visualizations to fit into four categories:

**FIRST**  The rising death toll
**SECOND**  Tug of war
**THIRD**   Refugees in their safe haven
**FOURTH**  The journey of a thousand miles

OPPOSITE PAGE
The image on the left is a bird eye view image of tents and shelters for immigrants in northern France taken by Pascal Rossignol.
Reported deaths caused by random shootings or mass killings
March 2011 - August 2015

Fewer deaths have been reported in ISIS-controlled areas, where access to information is especially limited.

The first type of representation is done to shed light on the horrible acts of violence occurring on Syrian grounds through images, videos, and graphs that are often used for statistical representation (bar charts, and bubble charts, heat maps, etc.).

The first example in this category is from the New York Times titled *Death in Syria*. The goal is to visualize the casualty count on top of a Syrian map. It employs red circles to portray where the more violent parts of the country are located. It does so by plotting how many casualties have been reported in each of the different parts. This piece correlates the number of the casualties with the radius of the circles plotted. This gives the reader an automatic sense of the distribution of violence within Syria, and what areas are suffering the most. This method is useful for the readers of the New York Times that might not be very familiar with Syria as a country or with the Syrian conflict. Although this method of presenting information, as employed here, is useful for an overview introduction to the topic, or a quick update, it doesn’t show other layers of information, like the demographic of those casualties or the events that led to those “bigger circles” for example.
The second example is from *the Economist*, and it portrays the constant increase in the number of Syrian casualties over time. It also uses the area of circles to indicate the number of deaths. This representation is mainly supporting material for the written piece that goes alongside it, and is used to elaborate on one element in the written piece.

The last example of this category, within this thesis, is an infographic produced by *the Independent*, and it shows the number of Syrians killed over the years using a couple different methods like the bar-chart, and circle isotypes. The poster gives a little more context around the situation in Syria by adding brief texts on other disasters, like damaged homes and the number of refugees and people who need humanitarian assistance.
Garcia, S. How the world has failed the Syrian people, in one graphic.

**Failing Syria**

At least 76,000 people were killed in 2014 out of a total of 220,000 since the crisis began in 2011.

76,000 people killed in 2014

**Number of people displaced**

4.3 million refugees are expected to enter neighbouring countries by the end of 2015.

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</tr>
</thead>
<tbody>
<tr>
<td>Refugees</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>IDPs</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
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<td>16</td>
<td>17</td>
<td>18</td>
</tr>
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</table>

12.2 million people or two thirds of the population within Syria are now in need of emergency assistance.

1 million + homes have been partially or totally destroyed in the past 12 months.

SOURCE: FAILING SYRIA REPORT
Mapping the different power dynamics present in Syria by pinpointing the different, internal and external, forces that are present and continue to contribute to the ongoing crisis.

The example for this category is titled, *Syria: Mapping the Conflict* done by the BBC, where they used a heat map, different colors, along with simple geometric shapes to explain a complicated dynamic of power on the battlefield, and show who has control of what areas of the country. This piece was also used as a supporting material for the written story on the BBC website. It was set to elaborate on one point which discussed which group controlled which grounds. It is easier to explain a point to your readers visually than to have them read a dense paragraph of information or elaborate on a certain point.
This category is the most represented visually, since it is quantitative, and it reports the number of Syrian refugees fleeing their country and arriving to different parts of Asia and Europe. This type of quantitative information, is easier to represent, and is usually achieved by using simple infographics along with statistical graphs.
The first example was published by The Guardian. The team illustrated the number of Syrian refugees in neighboring counties using bubble charts, while also using different icons to map where refugee camps are, and finally to map where the UN Humanitarian presence is. This helps the reader get a quick sense of where the people who need help are, and how many they roughly are, and where the help is stationed.

The second example was done by The Huffington Post where they used simple bar charts and heat maps to compare the different numbers of refugees in different European countries, and those different countries were represented by their flags for an easier read. This is a quick and easy way to get the reader familiar with the refugee distribution in different countries, but, it doesn’t show the reason the refugees choose to migrate to certain countries rather than others closer for example, to give more context on the situation.
Owen, P. A day in the life.

Bowden, G. Refugee Crisis In Europe Explained Through Infographics.
The last example of this category, within this thesis, was published by the UNHCR (United Nations High Commissioner for Refugees) to show immigration hotspots. It also portrays who is going where, and how many of those people are flowing from one country to another using bubble charts, bar charts, pie charts, and finally some radar charts. It gives the reader a quick comparison of the countries that have the highest citizens migrating out of it, and what countries have the highest citizens migrating to it.
Finally, the representation of the dangerous journeys refugees embark on to arrive to a safe haven. This thesis argues that this category of visualization is the least represented. This thesis will focus on an application that will humanize the visualizations that documents and focuses on the route and the journey of those home torn refugees. This chapter will look at, and discuss, different existing examples of visualizations and representations that tackle those journeys.
The first, and most used, type of information visualization representing the Syrian refugee waves are the classic flow charts (also referred to as Sankey charts). It is used based on the fact that it presents this flow of quantitative information using arrows that vary in width, and it gives the viewer a good sense of distribution of where the big waves of refugees are flowing.

The first example in this category is a visualization done in October 2015 by Alberto Lucas López, who is the Graphics Director at South China Morning Post, titled, *The Tide of Refugees*. This piece does a good job in portraying the flow on immigrants to the different countries by using a Sankey diagram. This type of diagram was invented by Mathew Sankey and was originally used to show different energy flows through arrow widths. However, this graph was most famously used by Minard in his representation of Napoleon’s March. This visualization done by Lopez shows a quick distribution of how many immigrants traveled to each country. But, it also differentiates if the refugees were admitted by the EU, or if they were applying for asylum in the countries they traveled to. Although it touches upon the sequence of countries in which the refugees pass by to get to their desired destination, because of the nature of the geographic layout, it isn’t very detailed. It doesn’t show how the refugees are leaving Syria, it doesn’t show how the refugees are traveling across long journeys, and it doesn’t show what routes different groups are taking to get from one destination to the other. This is not necessarily a limitation this type of visualization faces. The designer could have used different stroke types, he could have played with opacity to show the different routes, or he could have juxtaposed the arrows with typographic or iconic symbols to portray more information. It is a design choice that the designer makes based on various reasons such as the information at hand, the targeted audience, and the desired aesthetic.
For the first glance, since it takes a “flow” form, the previous visualization eludes in showing the journey of those immigrants, but it really shows the end result of the immigrations more so than the hurdles and obstacle those people face while traveling. On the side of the graph, the designer makes a small, but clear chart that shows the demographics of the immigrants, but, if that layer of information was mixed in with the Sankey diagram along with more details of the journey itself, the visualization would have been more complete.
The previous used the Sankey to geographically show the refugee flow. It was inspired by Minard’s Sankey graph that represented Napoleon’s march and became a very heavily quoted visualization and is considered a classic.
Carte figurative des pertes successives en hommes de l'Armée française dans la campagne de Russie 1812-1813.

Minard, C. Napoleon's invasion of Russia [REDONE Graph]. In Napoleon's March.
UNHCR, Greece sea arrivals and onward movements. (2015)
There has been many visualizations that map the basic routes from Syria to different the European countries. But, those representations are usually done by simple arrows with constant weight that differ in width and color. This thesis argues that those simple representations could have been infused with more layers of information, like means of travel or most traveled route, to give the viewer a more accurate sense of the situation. Like the previous example, this visualization is another example of flow rather than journey documentation.
Europe's Migration Crisis in 25 Photos. Digital image. CNN.
The second type of visualizations that tackle the routes of the Syrian immigrants are interactive in their nature. Those visualizations usually appear in traditional news outlets and often require you to “scroll” through the page and receive more pieces of information and details as you go on. This technique is good for storytelling, which is why it is often found in news outlets. The piece is meant to walk you through the narrative while revealing different, related, and relevant aspects of information as the reader moves along the story or the article. It creates a smoother flow of information that allows the reader to ease into things, and realize which aspects of the visualization is related to what is being read.

OPPOSITE PAGE
The image shows Greek police spraying a group of refugees with extinguishers during a registration process, published on CNN.
An example of an interactive visualization used for storytelling would be this piece that was featured on the Washington Post website in 2015 titled, *The Black Route to Europe*. It is part of their series *Exodus* by journalist Anthony Faiola working with designers Lazaro Gamio and Gene Thorp along with the photographer Charles Ommanney. In this piece, the team is telling a story of a group of immigrants traveling from Aleppo to Austria using scrolling interactivity method. With every scroll the user engages in, a new part of the journey is revealed accompanied by images of the travel and an updated map, that shows the location of the immigrants within it. The images work really well in this piece since they do bring out the human side of the struggle and the human side of the statistics and numbers we are used to see. The images are laid out between long text blocks that carry the stories, quotes, details and facts. The visualization, the map, on the other hand, doesn’t show the means of transportation, the time each leg of the journey took, the political and physical hurdles that faced the travelers, and so much more. It was a supporting medium, and not as important as both the texts and images. If the text blocks were shorter, and the map was detailed even more, by integrating the images and text details within it in various forms of interactivity, the map would have been capitalized on and turned into a great medium of storytelling. But, news outlets usually have a time constraint that factors in the level of time spent on each story.

**OPPOSITE PAGE**

This piece employs interactivity by scrolling through the narrative to unfold more of the refugee’s journey.
Four officers piled out. Their commander staggered over from a nearby brick building. The Jinaicis, it seemed, had unwittingly wandered in front of the Kanjiza police station.


Confusion ensued, in part linguistic: Finally, the commander used an interpreter.

“Are you going to a hotel?” he asked. “Are you staying here in Serbia?”

“No,” Ahmed answered in Arabic. “We are going to Hungary.”

“Legally?” the commander asked.

“No, illegally,” Ahmed answered. The four others looked at each other with raised eyebrows that asked whether honesty was truly the best policy.

“Uh, okay,” the commander said while casually lighting a cigarette. “Then you’re going the wrong way.”
Photographs on both pages are by Charles Ommanney as part of the Exodus story.
Both images from: Faiola, A. The ‘Black Route’ to Europe, and the story of a Syrian family who braved it.
There has been more examples of interactive visualizations that document the refugee journey. This is another example done by a team that works for the BBC titled, *Syrian Journey*: Choose your own escape route. This piece is essentially structured as a “game.” This game tries to put the reader in the shoes of the immigrants by asking them to answer a few questions. The viewer starts off by choosing the gender their refugee would belong to, then the visualization continues to give the reader questions with two different options of answers. In the end, with the answers they choose, the visualization reviles to the reader where their journey would have lead them based on the decisions they made throughout different situations. An interesting way to approach a problem. Although it brings the reader to a ground level setting of the situation by allowing them to take part in the decision making, it doesn’t make as strong as a statement since its only a five question short game. If it were a longer more complex question asking game, or featuring real images of refugees instead of drawings, it would have had a longer lasting impact. In the lives of the refugees, its much more than two straight forward answers to five simple questions.
More than nine million Syrians have been forced to leave their homes and you and your family are among them.

You have sold your house in Damascus for a fraction of its value - $20,000. You are now in Lebanon but you dream of the safety of Europe.

To make the journey, you must risk being smuggled across land or sea, or both.

As a Syrian, to get to Europe you have to go through Turkey or Egypt. You have to choose...

What do you do?

<table>
<thead>
<tr>
<th>Egypt</th>
<th>Turkey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt is cheap but living conditions are poor. The onward journey has to be by sea.</td>
<td>Turkey is more expensive but living conditions are better. You could reach Europe by land.</td>
</tr>
</tbody>
</table>

Claim asylum

You leave the mother and daughter struggling in the water and hope they make it.

You are now in Greece with your family – Europe at last! You know you need to keep a low profile because you can only claim asylum in country you first set foot in.

Three days later you find the man in a restaurant in the suburbs of Athens. He tells you fake UK passports. You then fly to Manchester.

You see the police at the airport in Manchester and you approach them and say: “I have come to seek asylum. I am from Syria.”

If you are granted refugee status you can now try to get your family over.
The first image captures a family crossing under a barb wire fence into Hungary from Serbia, taken by Bernadett Szabo.

The second image shows a group of refugees leaving their half sunken boat at the Lesbos shores of Greece captured by Bernadett Szabo.

The spread image was captured by Adam Gray, and it is of refugees resting and sleeping in a railway station in Hungary.
When emotions intersect with visualizations

humane representations for humanitarian disasters

Throughout history the world has witnessed many unfortunate events, wars, and crisis. There have been many visualizations that address the countless number of events in a humane manner. And, those visualization tend to have a longer lasting effect on their audiences since they represent a disaster on a more human level which helps audiences grasp the magnitude of the inhumane situation rather than placing casualty numbers on charts.

This section of the State of the Art will be presenting selected examples of different visualizations that tackle different historic events in a more humane way. While preserving the data and information, they bring the human element to the visualization employing various methods thus resulting in a more emotional affect on the viewer which will resonate with them longer.
Diagram of a large slave ship. Thomas Clarkson: The cries of Africa to the inhabitants of Europe, 1822
The first example is a very known piece by Thomas Clarkson, who was a British public campaigner against the slave trades, titled, *The cries of Africa to the inhabitants of Europe year 1822*. This visualization, although made hundreds of years ago, continues to be effective to this day due to its methodology. It visualized the state in which the slaves were being transported overseas.

This piece made one of the many major problems and issues in slavery visual for everyone to understand. It is unnecessary to know how to read English, or know how to read at all, to grasp the seriousness of the inhuman treatment of the African men and women. This visualization is key to this thesis, since one of the biggest hurdles facing the Syrian refugees today is crossing the Mediterranean Sea by small overloaded boats that have a high chance of drowning. Not to mention how expensive it is to get a spot on those boats, and how unequipped they are for such a journey. It is very important to visualize that specific situation in a way which communicates, on its own and without the use of words, the message across as this examples archives. It is also important to showcase the long part of the immigrant journey that is traveled by foot, which usually goes unreported and unrepresented in most of the visualization about this crisis in a similar fashion.
THE MISSING MIGRANTS MAP

In 2015 more than 5,700 migrants died trying to reach Europe, and more than 2,200 are missing. Each red dot represents a dead migrant, and each black one represents a missing one.

Incidents places are marked with the ® symbol, the worst ones are numbered.

The worst incidents occurred in Central Mediterranean, where 2,350 people died or are missing.

Central Mediterranean

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<th>Jan</th>
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Dead: Gambia, Syria, Ivory Coast, Nigeria, Mali, Senegal, Guinea, Niger, Somalia, Eritrea

08/02/15 Three inflatable rafts sunk, 300 migrants missing
http://migrant-793-8
13/04/15 9 migrants died and 90 are missing after a boat capsizes off the coast of Libya
http://migrant-797
19/04/16 38 migrants died and 562 are missing following shipwreck
http://migrant-889
06/08/15 25 migrants died and 200 are missing after shipwreck
http://migrant-890
11/08/15 10 migrants are missing after a rubber dinghy deflated due to the heat
http://migrant-2102
26/08/15 50 found dead from engine failure
http://migrant-596
28/08/15 111 dead 93 missing off coast of Libya
http://migrant-579
01/09/15 65 bodies found washed up near Tripoli and Sabratha
http://migrant-565

In mainland Europe happened less incidents, with lower number of victims. In this area, most of the migrants die trying to cross borders.

17/08/14 71 found dead in truck near Vienna, Austria
15 men, eight women and four children
http://migrant-506
24/05 - 12/05 13 migrants killed in or near the Channel Tunnel while trying to reach Britain, from April 2015
The Missing Immigrant Project is an example of a visualization done by Valerio Pellegrini and Michele Mauri. It won the Kantar 2016 gold award in the Infographic category. The visualization tracks the immigrants that were reported lost while on different migratory routes worldwide. According to the team that produced it, “[The project begun] with the October 2013 tragedies, when at least 368 migrants died in two shipwrecks near the Italian Island of Lampedusa.” The team has been tracking lost immigrants ever since. This piece plots the deaths of immigrants using red dots, and the missing immigrants using black. It gives a geographical bird eye view where those dots are, to “show both the morphology of the territory, and to highlight the fact that we all are citizens of the world.” The complementary graphs that are laid out around that map help add many layers of information to this piece. They all share a similar design language which allows the reader to get a better sense of the demographic of those immigrants, the distribution of the incidents around the world, the months that tend to have a higher immigrant missing incident and so on. This helps give more context to this global problem.
The third example, of using information visualizations in a humane way, is titled *The Fallen of World War II*, and it’s an example of an interactive visualization in a form of a short documentary that explores the human cost of World War II. As its designer and coder, Neil Halloran, states, “The film follows a linear narration, but it allows viewers to pause during key moments to interact with the charts and dig deeper into the numbers.” While watching the short docu-clip, viewers would usually pause to research more about a specific point they just learned about, if they wanted. However, the way this interactive piece is designed, it introduces the audience to a new technique where they can pause the docu-clip, but then dive into deeper levels of information on the same screen within the same visualization. This representations also shies away from just presenting the statistics in basic bar-charts, but in fact, turns the bar-charts into accurate human units so the viewer can then have a more accurate idea of the high number of deaths that happened per year, per country. The cost of war has never been cheap.
When the viewer interacts with the human unit charts by hovering over it, the visualization allows for a deeper level of information to be revealed.
Germany
5.1 million military deaths

In January, 1943:
- Caucasus Campaign
- Battle of Stalingrad
- Bombing of Hamburg, Dresden, and Other Cities
- Siege of Leningrad
A *Year in Iraq and Afghanistan* from the New York Times is another example of portraying the data and the facts in a more humane way. This, also, is a story telling visualization where the creators show the exact number of casualties in both the Iraqi and Afghani war using isotypes. Using isotypes is not an innovative methods, they are used very frequently in different visualizations, but often, and usually because of space constraints, a single isotope represents a bigger group (one man isotype would be equal to a thousand men in real time) but, in this case, every single isotype represents a single death, and that gives the reader a greater sense of how many lives were lost, during those two wars, and the number of casualties that were paid waging them. Which in return, makes it a much more emotional experience than seeing an estimate representation, or boiling all the different people with diverse backgrounds and death stories and dates into a single bar chart.

Adding two additional layers of information that also contributed to making this piece more emotional was achieved by mapping each soldier’s death, represented by a single isotype as mentioned earlier, to the exact location and the exact date of the incident. This technique helps make those deaths more of a concrete reality, and in a way, it offers more of a respect to the soldiers and their families when dedicating different pieces of the visualization to each soldier, valuing each death and loss of life in this war on the same scale.
Livingston, I., Cheng, A., & Gephart, S. A Year in Iraq and Afghanistan.
Isotypes, icon statistics, were first created by Otto Neurath in the 1920s and 30s. His aim was to use multiples of the same icon to represent quantitative information that communicated different ideas and messages. He saw that it was a more useful tool rather than depending on other existing variables that were in use at his time, like comparing two sizes, which he argues is a less effective way to compare two variables or quantities.

“A specially important part in the ISOTYPE system as it is presently used is taken by the pictures giving ‘statistics’ or the relation between amounts of different things— amount pictures or ‘number fact pictures’ To most men the reading of long lines of numbers is a great trouble— they put down a book when they see if has in it numbers or curves. But pictures are an attraction. This fact gives the ISOTYPE system a special value for all sorts of education.”–Otto Neurath. Isotypes are a key element in statistical information visualizations. It is always easier to compare, and grasp the differences, and similarities, between variables when done clearly and visually, rather than diving into lines of numbers.
Out of Sight, Out of Mind is a project developed in 2015 by Pitch Interactive, a multi-faceted interactive and data visualization studio in San Francisco. It is an animated visualizations that employs motion to communicate a message. Throughout the piece, the viewer sees a static timeline, representing the time period of the war on Pakistan, and also in a way, representing Pakistani land, the viewer then sees missiles and drones being dropped on that timeline, using motion and animation. Those missiles and drones create an explosion effect which then translates to the number of casualties represented in bar charts. Those bar charts are made out of units that directly correlate with the number of deaths, and are colored according to the type of the person who died (i.e. Innocent civilians, children, or high profile–targeted people).

Although the internet and social media make the world feel more like a small village, we usually tend to be disconnected from the intimate details of conflicts and its dark effects along its casualties. But, in this project, the team makes it more visual and more vivid. It brings this conflict that is physically far away from us, thus resulting in the mentality “out of sight, out of mind,” much closer virtually with the aid of motion. It also fights against the political argument of “getting the high profile bad guys” while showing you how many innocent lives, including children, are being paid in the crosshairs of the conflict.

This visualization had an Interactive element to it too. Its interactivity allows the viewer to dive into the deeper elms of the information by hover over the human representative icons and seeing what demographic they belonged to, and where the drone hit.
Sep 30, 2011

0 Children Deaths 0 Civilian Deaths 4 Other Deaths

4 of 15 Deaths that month

Where: Baghar
3-4 killed and 5 injured in strike on a vehicle.
Baghar, South Waziristan.
The book *A Land Without People for a People Without Land* is a series of visualization done by Nuno Coelho and Adam Kershaw. The visualizations started as an exhibition, but then, took form as a book that employs its readers to use colors, which it cleverly provides, to discover the information that revolves around the Israeli/Palestinian occupation.

When the designer of a certain visualization holds back the information at hand, and requires the readers to discover it using different forms of interactivity, this allows to a more memorable experience. It also eases the reader into the different layers of information presented instead of overwhelming them with all the information at once, especially when the conflict is complicated in its nature. This book is a great example of such interactivity in visualizations.
Here are some more images from inside the book, A Land Without People for a People Without Land.
In the end, there has been so many representation of statistical information on various outlets and platforms about the Syrian crisis. However, more importantly, the humanitarian side of the issue gets lost with those representations. This thesis will bring forth that forgotten human side of the conflict’s representations where the true struggles and stories really lie.
Humanizing the Conflict
The image in the previous spread is of a group of refugees trying desperately to board a train in Croatia taken by Jeff J Mitchell.
This chapter discusses the conceptual framework and the arguments that this thesis will take on and make. It will reference examples from the previous chapter and discuss those related to the Syrian conflict, while touching on their shortcomings and how they could be improved. It will also touch on some visualizations, unrelated to the Syrian conflict, that have strong elements of humanization that can be employed in this application. This thesis attempts to humanize the information visualizations targeting the current Syrian refugee crisis, specifically, but could also be applied to other humanitarian conflicts. The definition of humanizing, in this thesis application, is based on three concepts:

**INDIVIDUALITY**  Focusing on each refugee.

**SUBJECTIVITY**  Subjectivity of the characters within the visualization.

**EMPATHY**  Evoking empathy rather than sympathy.
The human element has been visibly missing within the majority of the information visualizations that represent this conflict. Even though this conflict, at its core, is about a humanitarian crisis that is directly affecting millions of humans. From torn families, to lives lost, to orphaned children, to refugees embarking on long dangerous journeys, risking everything, to reach safety. Only to discover that they face a whole new set of obstacles when they arrive to their destinations. According to Mercy Corps, which published a report in October of 2016, “Syria’s civil war has created the worst humanitarian crisis of our time. Half the country’s pre-war population — more than 11 million people — have been killed or forced to flee their homes,” and this doesn’t include the Syrians living abroad who have blood and/or financial ties to Syria.

A big part of this humanitarian crisis, which also became one of the most talked about elements in the war torn Syria, is the journey, the exodus, which huge groups of refugees are embarking on, on a daily basis. This dangerous journey has grown to be its own main character in most of the multilayered stories that accompanies these fleeing refugees. Packing up their whole lives in small bags. Getting through dangerous check points. Dealing with illegal smuggler networks. Crossing country borders and barb-wires. Gambling with death in the heart of the Mediterranean Sea, traveling vast distances from one European country to another on foot. Each leg of the journey often requires a lot of money to be paid, while also facing the uncontrollable natural elements, with no guarantee and only hope to be legally documented and accepted. Then upon arrival, facing discrimination, fears of deportation, anxiety of starting a whole new life in a country who’s language they don’t speak, is just a few of the difficulties these refugees face which often people are unaware of.
In one of the refugee stories told by The Boston Globe, the reader gets a small glimpse into that world “Migrants and refugees from Syria and other lands had survived deadly sea crossings into Europe, risked beatings and tear gas, and endured long hikes under a sweltering sun. On the last day of their trek, they [a group of refugees] were stuck in the cold rain on a bridge over the Salaach River, waiting for Germany to let them in.” A terrifying struggle that affected this group of people for days and months, boiled down to three short but heavy sentences.

“Refugees from Syria and other lands had survived deadly sea crossings into Europe, risked beatings and tear gas, and endured long hikes under a sweltering sun. On the last day of their trek, they were stuck in the cold rain on a bridge over the Salaach River, waiting for Germany to let them in.”
This thesis' application will fill the void of humanizing information visualizations representing this conflict. It will use a few different refugee journeys as a vessel to achieve that, since they are hubs of information. The application will employ different visualization methods, along with adding layers of interactivity and involvement to achieve humanized visualizations. Details of the application will be discussed later in this chapter and in the following chapter as well.
Defining the problem, describing the void

Previous visualizations on this conflict, as seen in the previous chapter, tend to focus on one or two elements of the complicated conflict. They usually present data that portrays only one or two layers of information from a multilayered situation while relying on graphs (like bar charts, bubble charts, heat maps, etc.). And, the way those graphs, in this case, are designed, turn them into supporting material for reports or news stories and coverage for example, rather than being a “stand alone” visualization or the focal point of a piece. This is where there is a small void and space for improvement. The Syrian conflict, including the refugee journeys, has been well documented through different media outlets. Some news stories, videos and photographs succeed in delivering an effective experience for the viewer. They do so by snapshotting and capturing certain moments of the vulnerability and struggle, and later portraying these moments to their audience using different media outlets. This allows the viewer to see beyond the numbers and statistics. It takes them on a journey to experience a completely other life someone else is living. This experience lies in the details of the news story, the emotions in photographs, and the personal reflections of video clips. These elements can allow for a more human to human experience rather than a human to charts experience. This experience, if achieved, creates empathy. Aaron Walter writes in his book Designing for Emotion, “Empathy is the way we connect with one another, it is the platform for emotion.” More about empathy will be discussed in the “Humanizing Visualization” section below.
Another problem that contributes to the void, is that the visualizations tend to be designed mostly as supporting material, as mentioned earlier. The main information source is usually the journalistic story that comes along side it. Those stories, photographs, and videos often contain the deepest levels of information regarding the crisis. Since they often go into detail about a certain story, or capture a moment of vulnerability in a photograph, while the visualizations contain a more surface level layer. Those basic graphs often represent a specific point of information that is in the news story, for example, to help build a little more context around it. For instance, if the piece is talking about a group of refugees escaping Aleppo and making their way to Germany, the visualization would probably be of a bar chart that represents how many refugees have been registered in Germany in comparison with other European nations, to highlight the huge wave heading towards Germany.

Another reason worth mentioning that could have affected previous existing visualizations could be due to a certain limitation the designer, or company, faces. Limitations such as spatial, time, or even resource limitations that stop the piece from becoming a much more rich and layered visualization.

OPPOSITE PAGE
This image, taken by Aris Messinis, is of Syrian refugees sleeping on the floor of a train as it makes its way to Serbia.
Exports and Imports to and from DENMARK & NORWAY from 1700 to 1780.

The Bottom line is divided into Years, the Right hand line into £10,000 each.
Graphs that have been used in previous visualizations, regarding the Syrian conflict, tend to have a more neutral portrayal of events. They often use a visual language that strips emotion from the context of the situation. This neutral nature that they acquire are very effective for portraying quantitative information. They are great for showing the differences in values, but without added layers to them, they cant represent qualitative information, and surely, cant represent emotions. Going back in history, William Playfair invented a big group of those graphs, referred to as statistical graphics, to represent numbers and very dry statistics visually.

When a visualization uses those neutral graphs to represent a crisis, it usually strips, or minimizes, the human elements, and turns the pain, loss and suffering into numbers on bar charts, or pixels on screens. Those types of graphs, as great as they are to serve other purposes, are too abstract and far removed from the reality on the ground. They create distance between the viewer or reader and the event, because it cannot transit emotions. As a result, the conflict is then over simplified and fails to deliver the true essence and the feel of the crisis, especially if one only saw the visualization without the story or piece that goes along with it.

The graph on the left from William Playfair’s trade-balance time-series chart, published in his Commercial and Political Atlas, 1786. Playfair is said invent several graphs like the bar and area chart for economic data.
Existing visualizations, in result, tend to have a more temporary effect on its reader. If those graphs, or visualizations in general, portrayed a smaller group of refugees, rather than an abstract collective, they would generate more empathy. And as a result, they would have more of an impact, and a long lasting presence in the readers memory. It is difficult to capture human emotions and struggles and encapsulate them in a designed piece, which is why this type of visualizations poses challenges to the designer, and thus is under represented. Though, it will be hard, and impossible, to capture all, or even most, of the emotions and layers of complexity to a crisis, humanization of visualizations still pays its dues to introduce a glimpse into that world to the viewer.

Humanizing those visualizations that represent conflicts where millions of people are fleeing from are of great value and importance. Often, the audiences of the existing visualizations and representations that are emerging reside in Europe, Canada and the United States. These are two of the main areas that refugees are aiming towards. It is only natural for the residents, including politicians and security forces, of the host countries to be worried and anxious to receive people who are coming from a war zone, especially if they only read about them and view them as numbers and statistics. When you put faces and names to represent the collective whole, it eases people to acceptance. And acceptance from the residents, in all the parts that they play in that nation, is key to the refugees’ resettlement period.
Exports and Imports of SCOTLAND to and from different parts for one Year from Christmas 1760 to Christmas 1761.

The Upright divisions are Ten Thousand Pounds each. The Black Lines are Exports the Ribbed Lines are Imports.
This thesis does not argue against the usage of the graphs that are often used for statistical representation, but it explores how they can be employed to add humanization to a piece. This type of graphs, like the bar chart, are a great foundation for many visualizations throughout history, and their importance is so vital to the field. They are not flawed in their nature, but they are limiting if used as is, especially to represent information with emotions involved, as we saw in the previous chapter. This thesis does not aim to improve on this type of graphs. It will be using, and depending on, combinations of different information visualizations elements and tools to evoke an emotional response–empathy, and to generate an effective story telling graph using those different elements while narrating a story of an individual who is the subject of the visualization.

OPPOSITE PAGE

Refugees keep warm with a fire near their tents close to a registration center on one of the Greek Islands
Humanizing visualizations

How can a visualization be humane? What is the definition of humanization? In the classical sense, and according to the Merriam Webster dictionary, to be humane is to “portray or endow with human characteristics or attributes; make human.” And, in the more formal sense, it is “intended to have a civilizing or refining effect on people.” This thesis will create an application which turns the refugees embarking on the treacherous journey into the subject of the story behind the visualization, rather than being an object within it. The three main concepts that the thesis application will be focused on, as briefly mentioned earlier, are:

**Individuality.**
Focusing on one refugee, or a very small group, rather than the collective all. Those stories become the vehicle that sheds the light on the issue as a whole.

**Subjectivity.**
The heroes of the visualization will be the main subject of it rather than being sheer objects within it. It will represent their personal stories and struggles by tailoring the visualization based on their experiences and what shaped their trips. Giving examples and glimpses that represent the humanistic details of some trips will, in return, give the viewer a sense of how bad the situation is as a whole.

**Empathy.**
Evoking empathy rather than sympathy. Empathy is key.
Individuality is the first step towards humanizing a visualization. The application will be focusing on real stories based on one refugee at a time. Representing one person in comparison to giving overall blanket-statements statistics and statistical graphs has proven to be much more powerful on the way viewers receive that information. Paul Slavic PhD, a professor of psychology at the University of Oregon and the president of Decision Research, writes in the American Psychology Association in his article Psychic Numbing and Genocide, “If I look at the mass I will never act. If I look at the one, I will.” This statement, uttered by Mother Teresa captures a powerful and deeply unsettling insight into human nature.” Slavic is talking about a single characteristic in human nature. We simply tend not to be moved by dry statistics, we are numb to them even if they represent a humanitarian crisis, and don’t have the urge or motivation to help. He writes, “Numerical representations of human lives do not necessarily convey the importance of those lives. All too often the numbers represent dry statistics,” human beings with the tears dried off,” that lack feeling and fail to motivate action”. But, once it is reduced to a singular representation, people tend to be more encouraged to help and try to make a change. “Most people are caring and will exert great effort to reserve “the one” whose needy plight comes to their attention.” This is why the thesis application will be focusing on three different individual stories that, in return, represent the situation as a whole.

Subjectivity, turning the character into the main subject of the visualization, rather than a sheer object within in, is the second step. It is the connecting link between individuality and empathy. When you choose one individual to act as the vehicle in which the information is portrayed through, naturally they will become the main subject of the visualization. This paves the way for empathy.

Tim Brown, of Designing Thinking, said, “Empathy is at the heart of design. Without the understanding of what others see, feel, and experience, design is a pointless task.” Some of the existing visualization representing Syria tend to evoke a sympathetic response. The viewer tends to feel bad for the people involved.
Empathy is when the visualization allows the viewer to put themselves in the place of those struggling, or those represented. It operates as the gateway for the reader to understand and relate to the hero of the story, and that is what this application will achieve. To shed the light on the importance of empathy, Dr. Brene Brown in her piece The Power of Vulnerability says, “Empathy enables us to relate to and console, while sympathy distances us.” Empathy is the vehicle in which we connect to people who tend to be geographically far away from us on a deeper, and more personal level. To induce empathy, the thesis will be showing the different layers of information, and obstacles, the refugees represented need to navigate through during the different legs of the journey, while pulling in real stories and images from the trips into the visualization. History is filled with examples of crisis, conflicts and wars that have been depicted and visualized in a humane way. This thesis will surely be pulling inspiration from some of those examples, referenced in the previous chapter like the Slave Ship Illustration for example, as a guide.

There is an ongoing debate between two pioneers in the information design field between Tufte and Holmes on the usage of metaphors, decorations, and connecting with audiences through diagrams and charts. In the book Graphic Design: The New Basics, Ellen Lupton and Jennifer Philips quote Edward Tufte, by saying, “[He] argues that a chart or diagram should employ no metaphoric distractions or excessive flourish, but should stay in the realm of objective observation.” This is what Tufte called, Chart Junk. On the other end of the spectrum, there is Nigel Holmes. His diagrams are filled with metaphorical decorations and “chart junk.” Tufte replied to one of Holme’s charts by saying, “Lurking behind chart-junk is contempt both for information and for the audience. Chart-junk promoters imagine that numbers and details are boring, dull, and tedious, requiring ornament to enliven. If the numbers are boring, then you’ve got the wrong numbers.” Holmes, however, answered back to this by saying that he used humor to evoke good feelings and emotions. He argues that emotions are important. He quotes Roger Erbert by saying, “Your intellect may be confused,
“Your intellect may be confused, but your emotions will never lie to you.” Holmes wants to appeal to the audience in a human way, employing humor, because he wants to connect with the audience and that they seldom know everything about a subject, and they might be confused or intimidated. This thesis’ point of view on the matter lies in the middle of both arguments. The visualizations emerging from this thesis will agree with Tufte by having no decorative elements to flourish them. They will have no metaphorical distractions. However, they won’t be very objective. They will take Holmes’ side by evoking human emotions to connect with the audience. They achieve so by using empathy rather than humor. These visualizations will layer multiple levels of information focusing on one individual’s story while depending on interactivity to create this metaphor that will evoke empathy and human emotions which will function as the vessel between both humans, the human represented inside the visualization, and the human reading it and interacting with it.

The application of this thesis is enhanced with interactivity. The viewer is able to interact with the visualization instead of looking through a few static representations of journeys. That interactivity allows the reader to engage and submerge with the subject that is being represented by the visualization at hand, rather than being purely observers. Interactivity on its own does not contribute to making the representation, or an experience, more humane, but, it can create a metaphor that can help achieve humanization. Another advantage to interactivity is that it often has a longer impact on the viewer. It turns the experience from a one sided relationship to a two sided relationship that both the visualization and viewer take part in. It often allows the viewer to dive into the information when they wouldn’t have previously cared to. Scott Murray talks about the importance of interactivity in his book Interactive Data Visualizations for the Web, “Interactive visualization can be a great medium for engaging an audience who might not otherwise care about the topic or data at hand.” Interactivity could also be tied to a flow model of enjoyment, and that is where there is opportunity to communicate more complex levels of information is introduced. This thesis uses layering see
through papers to create the interactivity. Layering the different pages on top of each eases the reader into the subject at hand. It doesn’t intimidate them by revealing too much at once. Once the reader becomes comfortable with the first level of information, more is gradually added whenever the reader wants. This method of interactivity also keeps the reader engaged and connect to the visualization.

The application will only contain three images. These three images introduce the three heroes of the three different journeys that are visualized. Content outlets, in all their forms, are filled with pictures, images and documentation of people from all walks of life captured during moments of extreme vulnerability and difficulty. “Flooded with images of the sort that once used to shock and arouse indignation, we are losing our capacity to react. Compassion, stretched to its limits, is going numb,” Susan Sontag writes in her essay, Regarding the Pain of Others. The world is saturated with these examples and images that people have become numb to them, to a certain degree. This thesis focuses on visualizing the different elements of the information involved in a clear, accurate and dignified manner.
In short, this thesis humanizes information visualizations by employing individuality, subjectivity, and empathy of the refugees. This will function as a vehicle to spread awareness about the crisis as a whole, rather than portraying blanket-statement statistics and overall view portrayals.
Experiments & Applications
Humanizing visualizations representing the Syrian conflict
applying the arguments made

This thesis’ application is a production of an additional book titled “Visualizing the Forgotten.” In this book, the history of the Syrian crisis will be documented and encapsulated since its ignition. The book sheds some light on the various aspects and elements, like historical factors and political events for example, involved in this crisis which are also sometimes unique to it. A Syrian refugee journey can be made out of three stages:

**FIRST**  The difficulties of being smuggled out of Syrian grounds to any neighboring country.

**SECOND**  The horror of crossing the Mediterranean Sea on small overloaded dinghy boats from Turkey to Greece.

**THIRD**  And finally, the last leg of the trip, traveling on foot, busses and train from Greece to the final destination in Europe.
Since the overall trip could be divided into three sections, this book is divided into three main chapters as well. Each chapter has information that builds context around the targeted trip to provide deeper understanding of the situation. The chapter also has its own main visualization that will tell a story of one individual refugee which uses different design techniques as well as employing interactivity through transparency sheets. Since each leg of the trip also has its own various levels of information, and most importantly obstacles and dangers, giving each slice its own focus will start to show the magnitude of the three torturous journeys, and the human cost of the Syrian crisis as a whole. The three refugees represented in the three main visualizations are real people who really went through and experienced the journeys portrayed. The first two stories are from journalistic sites, and the third story was collected through a personal interview I conducted with the aim of not having all stories be personal interviews is to show that humanized visualizations can be achieved from the material and information given at hand.

This application book will achieve humanizing visualizations by depending on empathy, individuality, and subjectivity as discussed in depth in the previous chapter. It does so by basing the visualizations on one real story talking about one refugee at a time. It also continuously references these refugees and their families in the contextual graphs within each chapter to reinforce the idea that there are humans behind the charts, pixels and colors.
The data behind the stories

During the making of the three visualizations in the application book, all the details that add the humane element to the representations emerged from the composition of information from different sources. The visualizations encompass two types of datasets and information:
First: Traditional datasets that were collected from:
- Eurostat, which documented the number of asylum and first time asylum applicants by citizenship, age and sex since the year 2008.
- SyrianShuhada, an arabic database that collects the number of deaths per city per week within Syria from the beginning of the conflict in the year 2011.
- UHNCR which states the number of registered Syrian refugees, escaping Syria, per week.
- Syrian Regional Refugee Response, which contains the stats of cumulative Syrian refugee applications.
- Missing Migrants projects, where they keep track of the number of immigrants lost and dead while crossing seas. The data used from this database is focused on the lost and dead migrants on the Mediterranean Sea since 2011, which are in majority Syrian.

Second: News pieces, photographs, and videos, a less traditional source of information and data collection.
Since journeys tend to be a very personal experience, and difficult to represent on a data sheet, news articles were scraped for details on individual trips and experiences to help guide the representation.

Third: Interviews.
Yamen, the refugee represented in the last chapter was interviewed over Skype where the details of his journey were told.
Demographics

distribution of age and gender

Millions of men, women, and children risk their lives in the journey out of Syria and into neighboring countries. As of June 2015, 2.2 million people have crossed into Turkey, and an estimated 41% of those are under 18 years old, including 720,883 children.
CHAPTER I

Leaving Syria

This chapter tackles the first leg of the journey, which is escaping Syria. Naturally, Syrians will escape to neighboring countries. These neighboring countries will either be their long term residence, or a pitstop until they can secure a smuggling route to Europe. Amal is the hero of the visualization in this chapter. Her and her children will be referred to in the pages right before her visualization that build context and give more information about Syrians leaving Syria to it’s neighboring countries. She will be the face to the millions who made this escape.

Amal is a 28 year old mother of two. She is the representation of the countless number of parents who are desperate to grant their children safety and a bright future outside of their homeland where their dreams once lived. She defies all odds by facing the tortuous trip she embarks on without her husband, while also caring for her younger brother. All this while having to deal with the unreliable network of smugglers that emerged due to the Syrian conflict. She is her children’s hero, and she is the first visualization’s hero and focal point.
This visualization, representing Amal’s journey, focuses on the various different levels of information she, orchestrated by her smugglers, needs to navigate around to get out of the war torn country. There are five layers. The first is the geographic location of Syria (capital and major cities and neighboring countries). The second is the distribution of power in different parts of the country, who controls what. The third is the location of the border crossing points and who controls them, and what their status is (i.e. open or restricted border). The fourth is the location of the refugee camps. Finally, the fifth is Amal’s journey from Damascus, where she lived, to the southern borders of Turkey. Each of those layers of information is mapped on an individual see through paper sheet. This allows the viewer to pile the pages, the layers, on top of each other to finally get an overview image of the messy situation which is the reality on the ground. It also helps ease the reader into the complex layers of information without intimidation.
On the facing page, there is a close-up of Amal’s trip. This allows even more details about her dangerous journey to emerge by comparing the timeframes of the trip before and after the conflict, by showing the points where she changed smugglers, by showing when she ran out of water, by showing the points of the trip that were filled with fear due to gunshots being fired around the area, and, by showing how long she had to walk to cross the border, carrying her two month old daughter. This, along with the layers of information, allow the visualization to paint a more accurate representation of Amal’s situation, which hundreds of thousands of other Syrian like herself go through on a monthly basis.
CHAPTER II

The Mediterranean: The Gateway to Europe

This chapter addresses the second leg of the journey, which is leaving the neighboring countries and heading towards Europe. After the continuous escalation of violence in Syria, and the prolonged conflict, hundreds of thousands of Syrian refugees decided to make way to Europe to try to build a new future there for them and their families. A huge number of them do so by being smuggled across the Mediterranean Sea on overcrowded dinghy boats which have a high rate of sinking. Abdul is the hero of the visualization in this chapter. He, along with some of the people on the overcrowded dinghy boat, will be referred to in the pages before his visualization which builds context and gives more information about Syrians crossing the Mediterranean and heading to Europe. He will be the face to the thousands who made this crossing.

Abdul is a 19 year son and a twin brother. He was studying to be a doctor in Syria, before the violence arose and cut his education short. After witnessing the horrific situation in his country and losing many friends and classmates to the war, he is now determined more than ever to travel where he can continue pursuing his degree, and with this noble, but difficult, profession, help people in need. Abdul has tried to cross the Mediterranean Sea before this specific
journey, but the trip never went through due to the smugglers backing out for unknown reasons or due to him not having enough money to fund his trip. But, he has finally found a smuggler who will arrange his trip and secured the money needed to board a boat to cross the Aegean Sea from Izmir, Turkey, to the Greek shoreline to start a new life, and fulfill his dream as a physician.

The second visualization represents Abdul’s journey on a small overcrowded inflatable dinghy boat, that was bound to travel from Turkey to Greece. However, this visualization shows that Abdul’s boat sunk while en route and several people drowned, including a mother traveling with her two young children. Abdul was left to gamble with death swimming back to Turkish shores over thousands of sunken dead bodies that belong to other refugees who tried to find safety before him, but never made it to Greek shores. The accurate representation of the number of dead and lost bodies at sea, at the time of Abdul’s trip, are visualized on an individual see-through sheet of paper that can be layered on top of the journey and geographical layout of that specific part of the Mediterranean Sea.
Total of 3,533 attacks on immigrants and refugees in Germany during the year 2016:

- attacks on migrants and asylum hostels (986 attacks)
- attacks on individuals (2,545 attacks)
- people injured (260 people)
- children injured (43 children)

Map showing travel times from Hungary to Austria:
- 60h (2 days and a half of continuous walking)
- 3h (3 hours)
- 40h (1 day and a half of continuous walking)

Budapest to Vienna:
- 3h (3 hours)
- 50h (2 days of continuous walking)
The last chapter examines the last leg of the journey, which is making way to the final destinations in Europe. Although most Syrian refugees head to Germany and Sweden, they have been seeking refuge in countries all over Europe. Refugees who arrive in Europe travel by bus, cars, and trains. But, one of the most common means of travel, for both financial reasons and to avoid being caught by authority, is traveling by foot. Thousands of Syrians make their way through Europe walking for hours and days, while sleeping in abandoned buildings, tents, parking lots, stations, etc. Yamen, whom now lives in Wiesbaden, Germany, and whom I interviewed over Skype, is the hero of the last visualization in this chapter. He, along with his brother, will be referred to in the pages before his visualization which builds context and gives more information about Syrians on their exodus in Europe. He will be the face to the hundreds of thousands who made this journey.

Yamen is a 28 year old brother and son from a middle class family who fled from Syria after being requested to join the army in 2013. He did not want to fight in this war which would entitle him to kill his people. He fled from Syria to Jordan only 20 days before his collage graduation. Despite continuing his
education and graduating from a university in Jordan, with a software engineering degree, he was imprisoned for working at a company without a permit as Jordan stopped issuing working permit for Syrians. He then knew that he had to leave to Europe and make his way towards Germany with his younger brother to find a better life. Being in waters for 3 to 4 hours after their boat sunk in the Mediterranean Sea was only the beginning of that journey. Traveling to Germany from Greece usually takes two days by car or train, or it takes two hours traveling by plane. It took Yamen and his brother 23 long days, including sleeping in parks, walking for hours and hours, and dealing with illegal smugglers to finally arrive.

This visualization represents Yamen’s story. Every page represents a day on the journey. On each page, the location is stated and the events that took place are told through Yamen’s words. Since a refugee’s journey in Europe stretches out over days, weeks, and sometimes months, this visualization aims to recreate the passage of time through the passage of pages. Some days are relatively uneventful and are reserved for waiting for documents from officials. Others are filled with events and memorable moments that he retells. Relying on Yamen’s quotes to tell the story make the experience more personal but still gives the reader a sense of the situation refugees go through inside Europe. In this visualization, interactivity will occur through continuously flipping through the pages to reveal more of the narrative of the story. It is connected through one ongoing line that displays information regarding the means of transportation Yamen and his brother took. Transparency sheets were not used in this trip’s visualization since interactivity is achieved in an more fitting manner. It also disrupts the flow of the story and act as a distraction.
Day 1  A Military island, Greece.

"We were in the water for three or four hours (before they got rescued). I was with no life jacket, also my brother no life jacket.

"On the island, when we reached the military base, before they do anything they just took our names. I helped take the names because I spoke English.

"What's your name, what's your nationality?"

Of course the Moroccans, the Iraq, they say: "we are Syrian."

"Then they get us (took us) to a spot field."

They hosted them for about a day. It is an illegal island, you cannot escape (to another) legal island."

Day 2  A Military Island, Greece.

The boat Yalies was on, from Turkey to Greece, sank after it cost live and his brother 1,000 euros each to ensure a place on it.
The second experiment based on this thesis comes in the form of a sculpture displayed in a gallery exhibit alongside the application book, *Visualizing the Forgotten*. The cards are the size of business-cards that follow the same arguments made in this thesis and act as attention grabbers and conversation starters.

On the first side of each card, there are circles, representing 54 of the 470,000 Syrians who died as a result of the Syrian crisis. However, there is one circle on this side of the card that is highlighted in red without a label. On the opposite side of the card, the red circle stands alone, identifying the name of the Syrian it represents. This side of the card contains a more detailed story of the person’s death told through a paragraph that ends mid-sentence, acting as a metaphor for that their lives ended abruptly. The cards are stacked in piles, inviting viewers to come closer and interact with information about this crisis in a way they are not able to when simply viewing it through a screen. The pile will be made up of an accurate number of cards that contain an accurate number of circles which represents the accurate number of deaths. The viewers are encouraged to take a card with them. The more people interact with the pile, the more messy it becomes, which is another aim of the installation—a metaphor for the current messy situation. The pile of cards also acts as a miniature representation of a city within Syria. As time passes and more people get involved and interact with it, the city slowly starts to fade away and crumble—one card at a time.
He was only 8 months old, asleep in his family’s home when a bomb fell on their neighborhood.

Ahmed Ibrahim

Ousada Dalal

Ousada 23 was pulling people out of the rubble of their destroyed homes in the heavily bombed area, when an innocent civilian explosion struck again instantly.

54 out of 470,000 deaths

54 out of 470,000 deaths
In the end, there has been so many representations of statistical information on various outlets and platforms on the Syrian crisis, but, and more importantly, the humanitarian side of the issue gets lost with those representations. Humanizing those visualizations, that represent conflicts where millions of people are fleeing from, are of great value and importance, since most of the audiences of the existing visualizations and representations that are emerging reside in Europe, Canada and the United States. These are the main areas that refugees are aiming towards. These visualizations can create a different, more empathetic relation towards the refugees as individuals and can help reframe the issue and be more proactive. It is only natural for the residents, including politicians and security forces, of the host countries to be worried and anxious to receive people who are coming from a war zone, especially if they only read about them and view them as numbers and statistics. When you put faces and names to represent the collective whole, it eases people to acceptance. And acceptance from the residents, in all the parts that they play in that nation, is key to the refugees’ resettlement period. This thesis’ application fills the void of humanizing information visualizations representing this conflict. It uses a few different refugee journeys as a vessel to achieve that, since they are hubs of information. The application book employs different visualization methods, along with adding layers of interactivity and involvement to achieve humanized visualizations.
There has been support for this project by many. BCARS (the Boston Consortium for Arab Region Studies) were interested in the application book, “Visualizing the Forgotten.” They have partially funded the printing of the book. Moving forward, I will continue my work with them on visualizing Syrian refugee journeys. I will also submit the project to take part in different conferences, along with trying to publish it. In the times when events like Brexit, the Trump presidency, the rise of xenophobia all over Europe, and the idea of “fear of the other” fuel hate crimes towards refugees and immigrants, I believe that it is important to continue working on visualizing this crisis, and others like it. It is important to try to build bridges between refugees and immigrants from all around the world, and the people who reside in the countries they head towards to lessen the fear and build tolerance, love and acceptance.
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