HUMANIZING THE HOLOCAUST

by

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A THESIS

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2020 marked 75 years since the end of the Holocaust, often referred to as the Shoah, meaning "catastrophe" in Hebrew. As the Shoah becomes a more distant part of our history, we begin to lose the eye-witnesses, the survivors, who carry the truths of the Shoah and the memories of its victims. This thesis intends to illuminate and immortalize the stories of those who experienced the Shoah so that the truth persists through generations to come. The software created with this intention is a facial recognition software that pairs the user with a Holocaust victim or survivor that mirrors their appearance. Ideally, this creates a surreal, visceral, and emotional connection across time. This would allow for a more genuine mourning and humanizes the individual, as well the user's understanding of the Holocaust. The match's history, even if just a small portion, would live on in the user. Ideally, the carrying of this story and its weight would encourage the user to then not only see the Shoah in terms of what they read about, but in terms of human life. This thesis also serves to combat Holocaust denial, a form of antisemitism that unfortunately still exists today. There is an immense amount of physical evidence and personal accounts that serve as educational tools in Holocaust research. I hope this software can also serve as both a gateway to exploring these resources and a reminder to keep humanizing the Holocaust amidst its horrible history of dehumanization.

Acknowledgements

I would like to thank Sr. Career Instructor Tyrras Warren for guiding me through this process, illuminating its sensitivities, and helping me ensure that the result is simultaneously highly impactful and respectful. I would also like to thank Instructor Phil Colbert for his expert advice on how to execute my idea in the most efficient and successful manner. For completing my academically diverse committee of three and offering her words of wisdom and encouragement, I would also like to thank Associate Professor Carol Paty. I am incredibly grateful to have been guided by such immensely talented and esteemed individuals. It has been a challenging, yet transformative experience to be part of the Clark Honors College, whose dynamic community has encouraged me to pursue meaning and impact in my creations and endeavors.

I would like to thank my mother, Cherie Lewis, for giving me the gift of education. Without fail, my mother has continuously supported my pursuit of an artistic path. She has given me endless love and encouragement and I am forever grateful to have such a strong and loving force in my life.

Lastly, I would like to acknowledge the souls who perished during the Holocaust. May their memory be a blessing and a revolution. Thank you to the Holocaust survivors, for your strength in the face of evil and for telling your stories. They will never be forgotten.

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Introduction

During my senior year of high school, my class participated in March of the Living. This international educational program brought thousands of Jewish students from around the world to Poland and Israel, along with a group of Holocaust survivors. While in Poland, we witnessed the remains of the atrocities of the Holocaust and listened to the stories of the survivors in the very places that they occurred. We visited what was left of various concentration camps and culminated the experience with a march through the gates of Auschwitz-Birkenau. We marched out of the camp with the survivors by our sides, an experience of life and freedom that millions of Jewish people never lived to face. Before our trip, each of us was given a slip of paper with a name of a Holocaust victim or survivor very similar to our own, accompanied with some additional information about their lifetime. My full name is Danielle Anne Lewis, and I was given the name "Anna Levis." This phonetic parallel solidified a connection across time. The sadness of this surreal connection allowed for a more genuine mourning.

In hopes of counteracting the severe dehumanization tactics and effects of the Shoah, my thesis embarked on creating a facial recognition software that pairs users with Shoah victims or survivors that mirror their appearance. By doing so, I hope to harness the effects of when I was handed my slip of paper with a victim's name, and amplify them by adding a visual effect. This visual parallel between the user and a Shoah victim or survivor would humanize the individual, as well the user's understanding of the Holocaust, by giving their name flesh and eyes.

Purpose

Considering the facial pairing is successful, this visceral and emotional experience is ingrained in the user, who would then become a carrier of the match's name, face, and memory. The match's history, even if just a small portion, would live on in the user. Ideally, the carrying of this story and its weight would encourage the user to then not only see the Shoah in terms of what they read about, but in terms of human life. Antisemitism has not been dismantled and continues to impact the Jewish community around the world. Holocaust denial, as a form of antisemitism, unfortunately still exists today despite physical evidence and personal accounts. The FBI's Hate Crime Statistics revealed that 60.3% of hate crimes in 2019 were anti-Jewish. Antisemitism has time and again accompanied fascism and white supremacy, as Jews have historically become the scapegoat during times of unrest. This rise in prejudice and hatred makes my project even more relevant. Hopefully it can cultivate a perspective and way of understanding which would then extend to how the user views other atrocities of the past, present, and future and result in an increased sensitivity to the value of human life.

Background on the Holocaust

The term Holocaust derives from the Greek *holokauston*, denoting a religious animal sacrifice by consumption of fire. This name reflects the manner in which many victims of the Holocaust perished: their bodies reduced to ashes in mass crematories. Many figures in the academic and Jewish communities understand this term to be a religious romanticization of the vicious acts carried out by the Nazis. Instead, they use the term Shoah, meaning "Catastrophe" in Hebrew, to encapsulate these events.

Michael Berenbaum, a scholar of Shoah studies, claims that "Germany fought two wars simultaneously: World War II and the racial war against the Jews." [1] The Shoah officially spanned from 1933 to 1945, during which World War II spanned from 1939 to 1945. The Shoah refers to the systematic state-sponsored murder of around six million Jews, along with millions of others, such as Romanis, the LGBTQ community, those with mental or physical disabilities, Soviet prisoners of war, and many others, by Nazi Germany.

Adolf Hitler, the leader of the Nazi party, was elected as chancellor in January of 1933. Through pervasive propaganda and rousing speech, Hitler gained avid support from Nazi Germans. In March of 1933, Nazis polled 43.9% of the election votes.[2] In 1934, he assumed the title of Führer in addition to his chancellor status. He established an absolute dictatorship and ceased further elections.

Nazism was not completely theorized by Hitler. It draws upon concepts and notions that have existed for centuries, such as Christian Anti-Judaism, philology,

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[1] Berenbaum, Michael. "Holocaust." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., 14 Jan. 2020, www.britannica.com/event/Holocaust.
[2] Berenbaum, Michael. "Holocaust."

anthropology, the theory of evolution, genetics, eugenics, modern antisemitism, and more. Dr. David Silberklang, a Senior Historian and Editor of Yad Vashem Studies, notes that "the Nazi world view claimed to be scientific." [3] It asserts the biological and cultural superiority of the "Aryan" race, primarily the North Europeans who are often identifiable by their blonde hair and blue eyes.

This belief situated the Jewish people as the anti-race who threatened the safety of the Aryans. Nazi propaganda depicted and exaggerated the stereotypical physical attributes of the Jewish people in complete contrast with the Aryan race. Propaganda images often depicted Jews as inhumane, taking the forms of parasites or devils plotting global domination. Hitler incited Nazism in Germany through this "scientific" racism and a radical sense of nationalism. The murderous events of the Shoah were the Nazi solution to the threat of the Jewish race.

Nazi Germany heavily utilized identity systems and documents to generate control and humiliation of the Jewish population. Jews were required to apply for a unique subset identification cards by December 31, 1938, which they were to carry with them at all times. By government decree, Jews were also required to mark themselves by wearing a white armband with a blue Star of David or a yellow badge in the shape of the Star of David with "Jude," meaning Jew in German, embroidered into it. The events of the Shoah began with these systems of identification. The German government conducted thorough censuses, one in 1933 to identify practicing Jews and one in 1939 to identify racial Jews.[4] These identification systems themselves dehumanized the Jews

[3] Silberklang, David. "Roots of Nazi Ideology." *Yadvashem.org*, Yad Vashem, 2020, www.yadvashem.org/education/educational-videos/video-toolbox/hevt-nazi-ideology.html
[4] Richard Sobel, "The Degradation of Political Identity under a National Identification System," Boston University Journal of Science & Technology Law 8, no. 1 (2002): 37-74

of Germany by reducing them to one aspect of their identity and forcing them to constantly prove their right to exist in the country. Additionally, the antisemetic prohibitions and events that followed these requirements were made possible by the identification systems that named nearly every Jew in Germany. The identification systems quickly became weapons. The Jews were publicly exposed and dangerously vulnerable.

Throughout the horrific events of the Shoah, Jews continued to experience the dehumanization tactics of the Nazi regime. They were stripped of their identity as the Nazis robbed them of their belongings, family, community, life, joy, dignity, and so much more. The United States Holocaust Memorial Museum conducted a research project that totaled the various sites of the Shoah. The results revealed that the Germans established 980 concentration camps, 30,000 slave labor camps, 1,150 Jewish ghettos, 1,000 prisoner of war camps, and 500 brothels with sex slaves.[5]

In an author interview entitled "'Less Than Human': The Psychology of Cruelty," Neal Conan of National Public Radio (NPR) discusses dehumanization with author David Livingstone Smith. Conan notes that "thinking sets the agenda for action, and thinking of humans as less than human paves the way for atrocity."[6] The focal theme and result of the Shoah was the dehumanization of the Jewish people. Its driving theory and motive portrayed the Jew as a pest to be exterminated. Jewish people were anthropomorphized as rats, leeches, and vermin in Nazi propaganda posters. Once you

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[5] Lichtblau, Eric. "The Holocaust Just Got More Shocking." *The New York Times*, The New York Times, 1 Mar. 2013, www.nytimes.com/2013/03/03/sunday-review/the-holocaust-just-got-more-shocking.html ?auth=login-google.
[6] Conan, Neal, and David Livingstone Smith. "'Less Than Human': The Psychology Of Cruelty." *NPR*, NPR, 29 Mar. 2011, www.npr.org/2011/03/29/134956180/criminals-see-their-victims-as-less-than-human.

reduce an individual to anything subhuman, Smith notes that the persecutors can then

"liberate aggression and exclude the target of aggression from the moral

community… It's wrong to kill a person, but permissible to exterminate a rat."[7] The

dehumanization of the enemy is what makes the carnage of warfare possible. This

dehumanization tactic is neither abnormal nor novel, as references to enemies as

subhuman creatures have been found in ancient Chinese, Egyptian and Mesopotamian

literature. Conan notes that "what's most disturbing about the Nazi phenomenon is not

that the Nazis were madmen or monsters. It's that they were ordinary human beings."[8]

Thus, it is vital to define and recognize dehumanization because it "opens the door for

cruelty and genocide."[9] The result of the Holocaust genocide itself reduced the Jew to a

number out of six million. To counteract this dehumanization, Michael Berenbaum

urges his students to unpack and humanize this number by counting to six million one at

a time. I have carried this sentiment with me for years and it has become one of the

driving forces behind this project.

[7] Conan, Neal, and David Livingstone Smith. "'Less Than Human': The Psychology Of Cruelty."
[8] Conan, Neal, and David Livingstone Smith. "'Less Than Human': The Psychology Of Cruelty."
[9] Conan, Neal, and David Livingstone Smith. "'Less Than Human': The Psychology Of Cruelty."

Figure 1: "Rats, Destroy Them"

Propaganda poster from Nazi occupied Denmark in the 1940s.

Figure 2: "*Vermin:* Life is not worth living / When one does not resist the parasite, / Never satisfied as it creeps about. / We must and will win."

Caricature from Julius Streicher's *Der Stürmer* (Issue #39) published on September 28, 1944.

Significance and Impact of the Face

The human face is a dynamic, visual stimuli whose significance and impact are captivating studies. The human ability to recognize faces begins at birth; neural responses of infants show a natural and advanced awareness of face-like stimuli.[10] In response to faces, a part of the temporal lobe of both infants and adults is activated. This area is thought to be the location of face processing and is a higher-level area of the visual system.[11] This natural predisposition has made facial perception "perhaps the most highly developed human visual skill."[12] The human attentiveness to faces will even elicit pareidolia, an illusionary phenomenon that causes people to detect faces in non-face images.[13] For example, a face can be perceived in the American electrical outlet, which has sockets that resemble eyes and a mouth. This sensitivity to face-like imagery reflects the natural human tendency to seek familiarity in their visual inputs. Many studies have illuminated how this process creates an "attentional bias for faces,"[14] which will capture the attention of humans faster than other visual stimuli.[15]

A study by Shamma et al. researched how the presence of faces in social media images affected their online social engagement. The effect of the face was significant, increasing the likelihood of receiving likes by 38% and comments by 32%. The authors considered the number of likes as a measure of engagement, and the number of

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[10] Shamma et al. "Faces Engage Us: Photos with Faces Attract More Likes and Comments on Instagram." *CHI 2014*, One of a CHInd, 2014, pp. 965-974.

[11] McClure, Max. "Infants Process Faces Long before They Recognize Other Objects, Stanford Vision Researchers Find." *Stanford News*, Stanford University, 11 Dec. 2012, news.stanford.edu/news/2012/december/infants-process-faces-121112.html.

[12] Shamma et al. "Faces Engage Us: Photos with Faces Attract More Likes and Comments on Instagram."

[13] Guido et al. "Effects of Face Images and Face Pareidolia on Consumers' Responses to Print Advertising." Journal of Advertising Research, 59(2):JAR-2018-030, 2018.

[14] Guido et al. "Effects of Face Images and Face Pareidolia."

[15] Hutton, S.B. and Nolte, S. "The effect of gaze cues on attention to print advertisements." Appl. Cognit. Psychol., 2011, 25: 887-892. https://doi.org/10.1002/acp.1763

comments as a measure of discussion. This study also found an increase of engagement in interfaces with embodied agents, which are computer-generated cartoon-like characters programmed to converse with users.[16]

Another study by Guido et al. analyzed the effect of face images and face pareidolia in print advertising. The paper recognizes the face as a significant, visual stimuli, both biologically and socially. Cross culturally, the face aids in the transmission of meaningful messages. Because of this, faces will induce "stronger involuntary responses: in large scenes containing a face among other objects, the very first saccades tend to be directed to the face."[17] In response to faces and face-like imagery, humans experience an "involuntary reflexive reaction to a sudden or meaningful stimulus."[18] This is known as the orienting response, which boosts attention and directs it towards the stimuli. This involuntary focused response mechanism results in the increased memory of the information embedded in the stimuli.

The human gravitation towards faces is a natural tendency to seek out the significant and the familiar. Faces offer a connection across cultures and time and elicit stronger reflexive responses and engagement. The function of faces in this thesis project also holds some similarity to the function of embodied agents. The faces in the USHMM database embody a story and a history. Through the software's facial pairing, they serve as agents who engage users in their story and offer a gateway into further engagement with the history. It is also interesting to note the use of the word "reflexive" to describe the human reaction towards faces. This denotes looking inwards towards

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[16] Shamma et al. "Faces Engage Us: Photos with Faces Attract More Likes and Comments on Instagram."
[17] Guido et al. "Effects of Face Images and Face Pareidolia."
[18] Guido et al. "Effects of Face Images and Face Pareidolia."

oneself. This familiarity and self reflection is amplified when the face in question mirrors your own. Additionally, it is essential to note the increased memory of the information embedded in the stimuli as a result of such a strong and focused response mechanism. Using a face to tell a story and a history will better ensure that the experience will remain in the memories of the user.

Software Functionality

This facial recognition software was built using Jupyter Notebook, an interactive web tool that can host a combination of software code, output, and explanatory text. The software uses the Python programming language and is supported by various Python packages. The data used for this software is privately sourced from the United States Holocaust Memorial Museum (USHMM) under a limited use agreement. The USHMM has an extensive collection of Holocaust records that contains millions of documents, artifacts, photos, films, books, and testimonies. This collection supports the "Museum's wide-ranging efforts in the areas of research, exhibition, publication, education, and commemoration." [19] Unfortunately, it also exists as evidence and must be maintained "to tell the truth about Nazism and to combat Holocaust denial, distortion, and minimization." [20] The data sourced for this thesis is a set of 600 ID cards that each include a profile image of the individual and their story.

The software begins by translating each image into a list of numerical values from the Euclidean distances of the face, which is essentially a multitude of distances between facial features that comprise an encoding to represent that face. Next, the user's image is analyzed and converted into numerical values that are then compared with the set of values from our dataset images. The software returns a face from the dataset that is the least distant from the user - i.e. the closest matching face. Accompanying the image is the individual's name and a link to their story on the USHMM website. Below is a run-through of the software.

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[19] "Scope and Nature of the Collections." *United States Holocaust Memorial Museum*, United States Holocaust Memorial Museum, www.ushmm.org/collections/the-museums-collections/about/scope-and-nature-of-the-collections.
[20] "Scope and Nature of the Collections."

Humanizing the Holocaust

A thesis project by Danielle Lewis at the University of Oregon.

Note: In order to execute the following, download the repo and launch Jupyter Notebook with terminal. This file is named face_matcher.ipynb. You may need to install various dependencies such as pip, cmake, openpyxl, xlrd==1.2.0, pandas, and face-recognition.

From these dependencies, we then import certain features that we will be using.

In [1]:
```python
import face_recognition
import os
import numpy as np
from IPython.display import Image
import openpyxl
import pandas as pd
```

Before we begin working with the image files, we read in our excel file with biographical information so that we can later access its data.

In [2]:
```python
xfile = 'data_names.xlsx'
data = pd.ExcelFile(xfile)
print(data.sheet_names)
```

['Sheet1']

We then parse the intended sheet into a data frame and preview it to check that the sheet was read correctly.

In [3]:
```python
df = data.parse('Sheet1')
df.info
df.head(10)
```

Out[3]:

	RECID	Image	Title	LastName	FirstName	ModuleId	Gender
0	1247W	1247.gif	Judith Gabriel Dichter	Dichter	Judith Gabriel	www.ushmm.org/wlc/en/idcard.php?ModuleId=10006253	F
1	1304W	1304.gif	Hans Heimann	Heimann	Hans	www.ushmm.org/wlc/en/idcard.php?ModuleId=10006256	M
2	1341W	1341.gif	Eva Rapaport	Rapaport	Eva	www.ushmm.org/wlc/en/idcard.php?ModuleId=10006260	F
3	1591W	1591.gif	Renee Schwalb	Schwalb	Renee	www.ushmm.org/wlc/en/idcard.php?ModuleId=10006280	F
4	1751W	1751.gif	Liane Reif	Reif	Liane	www.ushmm.org/wlc/en/idcard.php?ModuleId=10006295	F
5	1784W	1784.gif	Otto-Karl Gruenbaum	Gruenbaum	Otto-Karl	www.ushmm.org/wlc/en/idcard.php?ModuleId=10006298	M

	RECID	Image	Title	LastName	FirstName	ModuleId	Gender
6	1823W	1823.gif	Helene Melanie Lebel	Lebel	Helene Melanie	www.ushmm.org/wlc/en/idcard.php? ModuleId=10006301	F
7	2232W	2232.gif	Frederick Dermer	Dermer	Frederick	www.ushmm.org/wlc/en/idcard.php? ModuleId=10006341	M
8	2533W	2533.gif	Gertrud Gruenbaum	Gruenbaum	Gertrud	www.ushmm.org/wlc/en/idcard.php? ModuleId=10006367	F
9	2823W	2823.gif	Margit Morawetz	Morawetz	Margit	www.ushmm.org/wlc/en/idcard.php? ModuleId=10006437	F

The first step in working with the images involves processing our existing database of faces from the United States Holocaust Memorial Museum: https://encyclopedia.ushmm.org/landing/en/id-cards

A function is created that first recognizes each image and its respective file name (which corresponds to the image column of our data frame). The face_recognition tool then translates each image into a list of numerical values that represent the Euclidean distances of the face. You can read more about Euclidean distance here, but the face_recognition tool essentially collects a multitude of distances between facial features that comprise an encoding representing that face. At the end of the function, we are left with names and their respective encodings.

https://pypi.org/project/face-recognition/

In [4]:
```python
def load_images(known_images_dir):
    known_encodings = []
    known_images = []

    for file in os.listdir(known_images_dir):
        filename = os.fsdecode(file)
        image = face_recognition.load_image_file(os.path.join(known_images_dir,

        enc = face_recognition.face_encodings(image)
        if len(enc) > 0:
            known_encodings.append(enc[0])
            known_images.append(filename)

    return (known_encodings, known_images)
```

Next, another function is being created that will use the face_recognition tool to encode the user's face image. It will then compare this encoding to the database's encodings created above. The function will return a face from the database that is the least distant from the user - i.e. the closest matching face.

In [5]:
```python
def calculate_face_distance(known_encodings, unknown_img_path, cutoff=0.5, num_r
    image_to_test = face_recognition.load_image_file(unknown_img_path)
    image_to_test_encoding = face_recognition.face_encodings(image_to_test)[0]
```

```
        face_distances = face_recognition.face_distance(known_encodings, image_to_te
        return (unknown_img_path, known_images[face_distances.argmin()])
```

Now that the essential functions are created, we can call them. The load_images function is called to perform on the folder entitled "data_images" and proceeds with the encoding of the database images. We also load the user's image at this point by grabbing it from the "user_image" folder. In order for the image to be recognized, the file must be named "myimage.jpg".

In [6]:
```
known_encodings, known_images = load_images("data_images")

original_image = "user_image/myimage.jpg"
Image(filename=original_image)
```

Out[6]:

Now that we have uploaded the user's image, we can call our calculate_face_distance function to compare it against our database encodings and find the closest match. The file name (corresponding to the image column) is used to identify the matching person's row, from which we extract their name and link to their story.

In [7]:
```
matching_image = calculate_face_distance(known_encodings, original_image)[1]
import matplotlib.pyplot as plt
import matplotlib.image as mpimg
from matplotlib import rcParams

%matplotlib inline

# read images
img_1 = mpimg.imread(original_image)
img_2 = mpimg.imread('data_images/' + matching_image)
```

```
# display images
fig, ax = plt.subplots(1,2)
ax[0].imshow(img_1);
ax[1].imshow(img_2);

name_match = df[df['Image']==' ' + (matching_image)]

firstName = name_match['FirstName'].values[0]
lastName = name_match['LastName'].values[0]
bioLink = name_match['ModuleId'].values[0]

print("You look like " + firstName + " " + lastName + ".")
print("Learn their story here: " + bioLink)
```

```
You look like Edit Gruenberger.
Learn their story here: www.ushmm.org/wlc/en/idcard.php?ModuleId=10006727
```
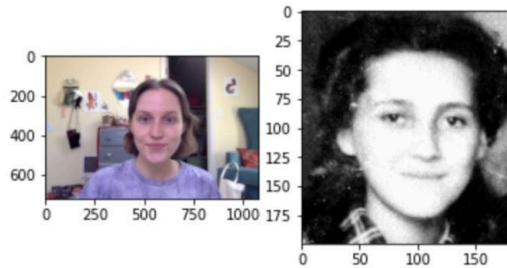

Figure 3: Software Run-Through

The software returned Edit Gruenberger as my facial match. The link brings us to her story: Edit was the second of three children born to Hungarian-speaking Jewish parents in the city of Kosice in the southeastern part of Czechoslovakia known as Slovakia. She grew up a Czechoslovak citizen. As a young girl, she attended a Jewish elementary school. Her father was a tailor whose workshop was in the Gruenbergers' apartment.

1933-39: After Edit finished elementary school, she entered secondary school. The language of instruction was Slovak and Jews faced no discrimination until November 1938 when Hungarian troops marched into southern Slovakia. With Germany's blessing, Kosice became part of Hungary and their new Hungarian rulers introduced anti-Jewish laws. When she finished her schooling in 1939, Edit began working as a dressmaker with her aunt.

1940-44: Edit worked for her aunt until 1941 when the Hungarians interned her and her family because they were considered "aliens." In 1942 she was released and returned to work. A month after the Germans occupied Hungary in 1944, Edit's family was ordered to assemble in a nearby brick factory. They were kept there until May when they were deported to Auschwitz along with most of the Jews of Kosice. When she arrived in Auschwitz, her mother and younger sister were sent to the gas chambers and she was selected for slave labor.

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After her transfer to the Muehldorf subcamp of Dachau, Edit was liberated in Tutzing by U.S. troops on May 1, 1945 and quickly returned home. She immigrated to West Germany in 1968.

Results and Aspirations

A project that involves facial recognition relies on the assumption that there exists in the database a face that matches that of the user. The software currently sources from 600 faces, the majority of which are Jewish. In order to increase the accessibility and accuracy of the software, the dataset should be augmented with a larger and more diverse set of individuals. This includes millions of others persecuted by the Nazi regime who were part of communities such as the Romanis, the LGBTQ community, those with mental or physical disabilities, Soviet prisoners of war, and many others. There should also be a guarantee that the user will be matched with someone, whether or not the pairing is based on facial likeness. For example, if there is no face in the database that reaches the match standard, the user could be paired based on a shared birthday.

The software remains private for the time being and will not be published without consent of the museum. Ideally, it will be publicly accessible in the future and will assist in the efforts of educational and memorial institutions such as USHMM.

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