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Auditing Social Media: Portrayal of Migrants on YouTube

In collaboration with

Re:framing Migrants in the European Media

Executive Summary

Social media connects us all. YouTube is the second most popular social media platform worldwide, and its recommendation algorithm determines the type of content we consume. Along with traditional media, YouTube plays a key role in entertaining, informing and shaping public opinion about global issues and events. Given that the migrant population has often been ignored or portrayed in a negative light in the media, it is important to examine how migrants are represented in the growing YouTube content. To explore this topic, we conducted this adversarial audit using a sociotechnical approach. This audit shows that there is a problem of biased and disadvantageous portrayal of migration on YouTube:

A) We found that YouTube's search and recommendation algorithms do not take into account a national context or distinguish between non-/migrant users when suggesting videos. However, certain types of migration-related content, particularly those that show migrants in a negative light, seem to be prioritized by YouTube's search and recommendation algorithms, regardless of national context or user background.

B) We observed bias in the way migrants and refugees are depicted in popular and recommended YouTube videos. Migrants are often portrayed negatively, in a dehumanized way, and predominantly as non-white individuals crossing borders. In contrast, refugees are mainly depicted as small groups of white individuals with clear face visibility.

C) Migration in general tends to be portrayed negatively in all YouTube content. Migrants were predominantly shown as victims in the form of large or medium-sized groups of non-white people crossing a border without a clear view of their faces, which perpetuates their dehumanization and stereotyping.

The report is divided into 7 main sections. **Section 1** is an introduction to the audit. It presents the purpose of the report and introduces our research questions. **Section 2** examines the representation of migrants in traditional and social media. It also shows how various types of social media have been audited in the past and what problems they have revealed. **Section 3** describes the methods of this socio-technical audit. **Section 4** focuses on the results we obtained from our audit. **Section 5** discusses our central research findings and provides a set of recommendations. We suggest that YouTube should be more transparent and engage migrant and refugee communities to address biases and issues of misrepresentation on the platform. **Section 6** includes a discussion of the limitations of the study's methodology and analysis. **Section 7** closes the report with concluding remarks.

This audit has been produced in the context of the Re:framing Migrants in the European Media, a pilot project co-funded by the European Union. Re: framing Migrants aims to change current media narratives by assuring appropriate media representation of migrant and refugee communities across Europe.

CONTENT

Glossary

Term or Acronym	Definition
Data Scraping	a technique where a computer program extracts data from human-readable output coming from another program.
Dehumanization	to deprive (someone or something) of human qualities, personality, or dignity, or portray (someone) in a way that obscures or demeans that person's humanity or individuality.
Adversarial Audit	a process of evaluating the performance of machine learning models and algorithms in order to identify potential biases, errors, or other issues that may have an adverse impact on the decision-making process.
Facebook	a social networking website which allows users to create profiles, to connect with people online, as well as to share content and their own thoughts and opinions.
Instagram	a social networking platform which allows its users to share pictures and videos.
Migrants	people who move away from their place of usual residence, whether within a country or across an international border, temporarily or permanently, and for a variety of reasons.
Recommendation System	a subclass of information filtering system that provides suggestions for items that are most pertinent to a particular user.
Refugees	people who have fled war, violence, conflict or persecution and have crossed an international border to find safety in another country.
RQ	research question
Social Media	websites and applications that enable users to create and share content or to participate in social networking.
Sociotechnical Approach	a method that combines involvement of human elements and technical systems to explore the issue, as well as to identify possible paths to technological and social change.
Traditional/Mass Media	the means of communication that reach large numbers of people in a short time, such as television, newspapers, magazines, and radio.
Twitter	a social networking website where users broadcast short posts known as tweets, which can contain text, videos, photos or links.
Video Thumbnail	a still image in the beginning that represents a video.
YouTube	online video sharing and social media platform.

Introduction

Social media not only connects us with family and friends, it also increasingly shapes the way we learn about the world around us, what we think, and how we react to major political and social issues. Despite the difficulty of assessing the source credibility and trustworthiness, social media tools are increasingly used as information sources (Kim et al., 2011; Westerman et al., 2014). The negative effects of social media as information sources have been widely acknowledged. Social media facilitated the speedy dissemination of "fake news" (Silverman, 2016), disrupted democratic electoral processes as during 2016 US elections (Cadwalladr & Graham-Harrison, 2018), and even played a role in fueling violent conflicts such as Rohingya genocide in Myanmar (Stevenson, 2018). While social media enables quick and cost-free access to a large amount of information, the exposure to information is mediated by social media algorithms that reinforce "echo-chambers'' where like-minded people exchange information (Barberá et al., 2015) and "filter bubbles" (Pariser, 2011) where recommender systems filter the content based on the information (e.g. past-clicks, likes, searches) gathered from users.

This adversarial audit examines how migrants and refugees are represented on YouTube using a two-fold sociotechnical approach. First, we mapped **the portrayal of migrants and refugees in YouTube video searches** by **scraping data** and conducting **systematic content analysis**. Second, we looked at how people with a migrant background **perceive the portrayal of migrants on YouTube's most-watched and recommended videos.** Our research was guided by four main questions:

1. How are migrants and refugees represented in the top-watched YouTube videos?
2. Do YouTube's search and recommendation algorithms suggest differently framed migration videos in different national settings?
3. Do YouTube's search and recommendation algorithms suggest differently framed migration videos to migrant and non-migrant accounts?
4. How do individuals with a migrant background perceive the portrayal of migrants on YouTube videos?

Mapping the field: Representation of migrants

2.1 Depiction of migrants in traditional media

While the phenomenon of migration is as old as human history, migrants have become at the very core of heated political controversies, social tensions, and stereotyping. The **media plays a key role in informing the public about migration**, framing issues, shaping perceptions, and therefore setting the agenda for the ways that migration-related issues are publicly discussed (Bleich et al., 2015a). The media coverage of migration comes with important political consequences. The extent and type of media reporting on migrants has an influence on the rise of anti-immigrant parties in western Europe (Boomgaarden & Vliegenthart, 2007); public's identification of immigration as a "Most Important Problem" in the US (Dunaway et al., 2010); and perception of migration-policy frameworks (Merolla et al., 2013).

There is already an established research tradition that systematically studies how migrants are represented in mass media coverage. Eberl et. al. (2018) conducted a literature review of **European Media Studies on Immigration** between 2000 and 2018. They found 89 journal articles investigating immigration news coverage and its effects in an European context. The review shows that most of the studies dealing with immigration news coverage focus on issue-specific frames including economic, welfare, cultural, and security considerations, both from a negative (such as immigrants as a threat to security, culture, economy) and positive (such as benefits of immigration) perspective.

Other studies analyze media coverage across migrant groups, national contexts or news sources. **Different groups of migrants** tend to be identified with different framings. For example, while Roma people and Eastern Europeans tend to be portrayed as a threat to the economy and welfare state (Meeusen & Jacobs, 2017); non-Europeans such as North-Africans are more often associated with threats to culture (van der Linden & Jacobs, 2017).

Media coverage of migrants also changes **across national context.** For example, media content in **Western states** paints a picture of migrants around the concept of "**threat**", where the main narrative is delinquency and lawlessness (Merolla et al., 2013; Farris & Mohamed, 2018; Chouliaraki & Stolic, 2017). In **coastal states** such as Italy, in recent years the topic of migration and refugees has been a crucial discourse in the mass media and political debate, given the immateriality of their maritime borders, which serves as a symbolic link with all incoming migrants. A substantial part of the media narrative on the arrival to the Italian coast is the story of shipwrecks and loss of life (Bruno, 2016). Yet, a study that analyzes mass media coverage of migrants and refugees in 17 countries finds that media outlets in some Eastern European countries in general tend to take a more critical approach towards migrants and refugees (Fengler & Kreutler, 2020). In some **ethnically and nationally homogeneous**

countries that do not have significant migration experience, the picture of migration did not have any positive nuance either. For example, in the Czech Republic, a predominantly negative media representation prevailed after the 2015 migrant crisis and was focused on the image of a migrant who arrived from the Middle East. Such a portrait of the migrant was associated with terrorists who were not going to adapt to "normal" life in the Czech Republic (Bartoszewicz, 2022). **Transnational media** from the Middle East, such as Al Jazeera, in turn, tends to present a **more authentic portrayal** of the reality of migration while, to some extent, voicing their objections to excessive violence (Sjöberg & Rydin, 2014).

Additionally, the journalistic interpretation could differ depending on **whether the media source** was **a migrant** or a **non-migrant person.** In Spain, migrants were generally underrepresented in the mass media and deprived of their voice. If the news covered the topic of migration, it was typically framed in the context of political discussions with representatives of the state or the international institutions (Rodríguez-Pérez et al., 2022).

> *"Migration and migrants are portrayed*
> *as a threat the 'natives' need protecting from."*
> *Rasinger, 2010*

In general, migration is highlighted in the traditional media as a threat to social, cultural norms or economic well-being. Migrant groups are not seen as separate individuals with complex destinies, but rather are positioned as alien groups lacking positive human qualities (Murray & Marx, 2013). As a rule, traditional media portrays migrants in a negative light, as participants in criminal or delinquent activities (Eberl et al., 2018). News channels cover events involving migrants in terms of social unrest, crime, cultural misunderstandings, social problems and economic costs (Rosina, 2022).

Previous studies demonstrate that the way migrants are portrayed in the media has a **substantial impact on individual** and **public attitudes towards migration** (Boomgaarden & Vliegenthart, 2007; Esses et al., 2013; Valentino et al., 2013, van Klingeren et al., 2015). The more negative the portrayal of migrants and refugees in the media, the more **dehumanized** migrants will be perceived by the audience (Esses et al., 2013). Dehumanizing visual patterns link refugees to the concepts of **threats to sovereignty and security**, thereby reinforcing the politics of fear (Bleiker et al., 2013). In addition, the unfavorable picture may lead to the incitement of anti-immigration sentiment and consequently the promotion of restrictive anti-migration policies (Schemer, 2012; Valentino et al., 2013).

2.2 Portrayal of migrants on social media

While traditional media sources including newspapers and television are the most studied outlets for migration coverage, studying migrant representations on social media is relatively new. This is surprising, when we take into account that the Internet and social media have become a major part of our lives. The rapid spread of the Internet, smartphones and social media has significantly affected daily human interaction. The number of social network users worldwide is growing rapidly. According to a recent DataReportal report (2022), there were 4.65 billion social media users around the world in April 2022, equating to 58.7 percent of the total global population and more than 75% of people aged 13 and above.

Considering that social networks offer a **relatively cheap**, **easily accessible** and **media-rich** means of communication, these are one of the most vital tools that facilitate communication and interaction between people today. The impact of social networks on the lives of people in migration is no exception (Dekker et al., 2016; Thulin & Vilhelmson, 2014). Social media has been shown to **help and facilitate international migration networks**. Given that long distances are often involved in this issue, social media for example, helps migrants to transmit up-to-date location information remotely (Dekker & Engbersen, 2014; Vilhelmson & Thulin, 2013). Social networking platforms also **expedite asylum-related mobility** for many migrants in need of shelter. Merisalo & Jauhiainen (2021) surveyed asylum-seeker migrants in Jordan, Turkey, Iran, and in several European "hotspots," (Lesvos, Greece, and Lampedusa, Italy) and found that social media is a **supportive and facilitating tool for migrants** and helps them make decisions about **where to move in Europe.**

On the contrary side, migrants need to be able to use social media properly and carefully to benefit, as there can be **issues with credibility** and **accessibility to information** (Dekker et al., 2018). For example, access to the Internet, as well as basic phone chargers, may not always be available, keeping migrants and refugees out of touch. In addition, the use of smartphones and social networks entails **the risk of surveillance** by third, (non)governmental parties, which makes migrants even more vulnerable (Leung, 2010). To avoid such threats, many migrants seeking asylum use strategies to hide their identities by using avatars or digital aliases (Gillespie et al., 2016).

Undoubtedly, the mass media is still influential in shaping public opinion and attitudes towards events and certain groups, including migrants. However, social networks assist the participation of migrants in telling their stories in the first person, creating new perspectives and interacting with other users. In other words, mass media is an unilateral transmission, while social networks offer **two-way communication**. Being a space where people do not have restrictions, social media is a way to change the dynamic of the lack of migrants' voices. Compared to traditional newspapers, magazines, television broadcasting or radio, social networks allow people to create their individual identity, share their personal stories, contribute to discussions through the "comment" and "share" functions, and build their own networks. Moreover, the political information context has sustained significant changes over

the past decade (van Aelst et al., 2017), where the growth of social networks as sources of political information has led to new forms of news consumption (Matsa & Shearer, 2018). Today people are more likely to **consume news provided by social networks** rather than newspapers, television or even radio (Bollenbacher et al., 2022). For example, Facebook and Twitter have become one of the most significant news sources among online social platforms (Heuer, 2021). Since many people do not have direct contact with migrants and refugees, social networks are a valuable link in shaping our understanding of migration.

Why is it important to study the portrayal of migrants on social media?

As seen from the previous section there are already ample empirical studies on how traditional media portrays migrants, and why it is critical. Yet, given the growing use and influence of social networking platforms in people's daily lives, it is also vital to emphasize the weight of migrant portrayal on social media.

First, as the mass media coverage of migration can influence societal attitudes towards migration, social media framing can be both a vehicle and an obstacle for migrants to further their **social integration** and **acceptance**. The portrayal of migrants on social media can promote acceptance and empathy on one hand, as well as **discrimination and xenophobia** on the other hand. They can further bolster stereotypes and have a direct impact on how social groups are depicted.

Second, given the **rise of the right wing political actors** in Western countries, issues of migration and anti-immigrant sentiment are becoming increasingly popular in social/media (Nortio et al., 2020; Urman at al., 2022), highlighting the necessity and relevance of further studies into the ways migrant groups are portrayed.

Third, **migrants** themselves are in most cases **absent from the general discourse.** They are deprived of the opportunity to present their individual immigration story and narrate their destiny. This allows the society to perceive migrants only through the prism of the one-way mass media coverage, and social media can provide the means to partially address this.

Fourth, examining how social networks depict migration is crucial in order to be able to understand the **broader discourse surrounding migration**, which includes the various perspectives, opinions, and attitudes that people have about it. Moreover, this can help to gain a better understanding of the specific issues related to the online representation of migrants, such as stereotypes, biases, and misinformation that may be present in these depictions. All this highlights the need to explore further the depiction of migrants and refugees in social media.

2.2.1 Auditing social media

As of 2022, the average daily use of social media by Internet users worldwide is 147 minutes (2 hours 45 mins) per day. This has a significant impact not only on online activity, but also on the real life of people in general (Statista, 2022b). The most used social networks on the Internet, each with over a billion monthly active users, are Facebook, YouTube, WhatsApp, WeChat, Instagram and TikTok (Statista, 2022a).

While digital networks can assist different social groups and facilitate integration to a new environment, they can also undermine them in various ways. Social media algorithms are an influential mechanism stealthily affecting how content is displayed and how users behave online that act differently but additionally to individual user prejudice. Recommendation algorithms work to optimize user interaction and maximize his/her engagement with a particular digital platform. This computation is performed by individualizing recommendations based on past actions and content consumed by the user on each platform (Milano et al., 2020; Haroon et al., 2022). Simply put, social media algorithms trace a person's digital habits, predict his/her preferences, and decide what information to show to this user. In addition, by studying demographic and behavioral data, which includes the profile of users (e.g. age and gender) and analyzing their actions (e.g. comments on publications, likes, shares), digital platforms' algorithms can offer targeted advertising. However, as will be seen further in the text, these capabilities can also **introduce discrimination and bias.**

Furthermore, social networks can **limit access to different points of view** and help form groups of like-minded users that form and reinforce a common narrative, which can be unverified. Digital media algorithms thereby contribute to the creation of **echo chambers** - an environment in which users' opinions, political views, or beliefs on a topic are reinforced through repeated interactions with peers or sources with similar tendencies and views (Cinelli et al., 2021). Echo chambers can create misinformation and distort a person's point of view, favoring information that reinforces existing beliefs, making it difficult for him/her to consider opposing points of view and topics (GCFGlobal, n.d.).

The opaque and unregulated social media algorithms which control the information users consume, often resulting in disinformation and discrimination, represent concerns for the media and academic community. For this reason, researchers have conducted audits, analyzing algorithmic logic of popular social media platforms and online news on different harmful grounds. Global Witness's (2021) study found that **Facebook's** online platform optimizes the delivery of ads in **a gender-discriminatory manner**. A similar examination was conducted by Algorithm Watch through auditing Facebook and Google ads suggesting "gender-segregated" job offers. The results showed that Facebook relies heavily on an user's gender and gross stereotypes while showing job advertisements to him/her (Algorithm Watch, 2020). Yet, social media is becoming increasingly consumed as a conduit for political content. This question has also begun to attract more attention from researchers. **Twitter's**

recommendation algorithm has been audited for impact on the basis of political content. The results show that the **political right wing enjoys more amplification** from the Twitter algorithms than the political left, thereby reducing the visibility of the latter (Huszár et al., 2021).

The results of audits of social networks on the question of migration are mixed. A study of political and targeted immigration ads on **Facebook** in Italy found that the number of ads increased during the pre-election period, with the parties with the highest spending more heavily biased towards anti-immigration politics (Capozzi et al., 2020). In turn, Heidenreich et al. (2020) analyzed political Facebook accounts in six European countries for migration topics. The authors highlighted that migration theme was more visible in the posts of more ideologically radical parties. Moreover, the stronger the ideology of an extreme party, the more negative the mood of its migration-related status posts on their Facebook page.

De Rosa et al. (2020) researched people's social perceptions of immigrants through the photoposts on **Instagram**. The discourse revealed the presentation of migrants as vulnerable groups, as opposed to the portrayal of migrants as dangerous intruders. In turn, another study based on the analysis of Instagram stories by the Spanish right-wing party (Vox) related to migration, showed that migrants were in most cases portrayed in **a negative light.** Typically, the portrait was unidentified, black, and a male who is part of the group, and who were portrayed as participants in violence and fraud (Jaramillo-Dent et al., 2022).

Studies of Twitter have also shown varied results. From one side, tweets about migration and refugees are more **sympathetic** and also call for **further action**, thus creating new narratives and topics for discussion, different from the mainstream media's politicized depiction of migration (Nerghes & Lee, 2019). Another perspective encountered more **dehumanization** and **politicization** of migrants on Twitter. The stories of migrants were painted in far-right colors, where refugees were presented as rapists or terrorists (Siapera et al., 2018).

Overall, social media can present migration both positively and contrarily. Considering that the portrayal of migrants on social networks can form a discriminatory and stereotypical attitude and significantly affect the public perception of migration, an audit of social platforms and their algorithms is necessary. The importance of such audits is heightened by the insufficient platform oversight, transparency and regulatory frameworks that render social media platforms scarcely accountable. Audit studies are one of the tools that can help to effectuate the oversight of social media algorithms.

2.2.2 Why should we audit YouTube?

Second most popular platform

After Facebook, YouTube is **the second most popular social media platform** worldwide with more than 2 billion active users as of 2022 (Statista, 2022c). It works both as a search engine and a social media platform that connects people. As an example, in the US, 81% of the population reported using YouTube on a daily basis (Auxier & Anderson, 2021). Apart from creative and entertainment content, the popular video sharing platform is also an important source of news and useful information for a large audience. YouTube has become an important **"visual journalism"** platform for both traditional content from established news organizations and citizen eyewitness stories (Perez, 2012). Of over 80,000 people in 40 countries, 27% said they use YouTube to get news (Newman, 2020). In this way, the video platform plays one of the **major roles in informing people about global issues,** including situations with vulnerable social groups and overcoming stereotypes about them.

Visual platform

In addition, with the advent of social networks such as YouTube and Instagram, the **visual component** of social networks and information online has become increasingly popular. The reason for this was that images are easier and faster to perceive for the user, compared to textual content. The videos and images are more interactive and enticing for a viewer. They can also be captured instantly and uploaded to social media for public viewing (Jhoti, 2021). Visual portrayals are particularly influential, some studies even suggest that the very existence of "compassion depends on visuals" (Höijer 2004). The images can be seen as snapshots of certain situations or events: "visual quotations" (Sontag, 2003), which often linger in the minds of viewers and further shape their emotional attitude (Bleiker et al., 2013). On the other hand, images can also introduce ambiguous perceptions. The viewer perceives visual content through the prism of their understandings and prejudices.

YouTube's algorithms can create a harmful effect

YouTube uses a combination of different algorithms to promote content.[1] **Search algorithms** are used to help YouTube users find specific videos or content by matching their search queries with the titles, tags, and descriptions of videos on the platform (Hootsuite, 2023). **Recommendation algorithms**, on the other hand, are used to suggest videos to users based on their viewing history, engagement, watch time, as well as other factors such as the user details like their age, sex or location, and other personal information (DataFlair, 20). These algorithms aim to improve the discoverability of videos on the platform and make it easier for users to find the content they are looking for.

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[1] For the purposes of this study, we focused on YouTube's search and recommendation algorithms.

YouTube's recommendation systems work by matching and providing "*each viewer with the videos they are most likely to watch and enjoy*" (YouTube Help, 2022). According to YouTube's CPO Neal Mohan, as many as 70% of videos viewed on YouTube are suggested by their video recommendation system (Solsman, 2018). This figure indicates that a significant number of users are consuming video content recommended by the platform's algorithms. This makes the platform a weighty provider of any information, including on vulnerable social groups such as migrants and refugees. Consequently, the recommendation algorithms of YouTube can affect the perception of the migration of a large number of people around the world.

YouTube's algorithm system is attracting increasing attention from academics and the media, sometimes suspecting the platform of being **malicious**. Many researchers and media outlets have raised concerns that YouTube's algorithm is exposing users to divisive, unverified, terroristic, conspiratorial, and otherwise debatable content. For example, some authors allegedly identified YouTube's recommendation machine as a **radicalisation tool** that leads people to rabbit holes of extreme content (Conway & McInerney, 2008; Murthy, 2021; O'Callaghan et al., 2015; Ribeiro et al., 2020). Other studies have analyzed and audited the YouTube recommender systems with a focus on **misinformation** or **conspiracy theories** (Albright, 2018; Hussein et al., 2020; Nicas, 2020; Warzel, 2017). Serious concerns were caused by the creation of the so-called "**filter bubble" effect** - states of intellectual isolation, a negative consequence of personalization in social media and search engines (Pariser, 2011). In other words, it is a state when users receive content that reinforces their beliefs and social identity, thereby entering their own personalized bubble, while content from opposing points of view and views is filtered out (Hussein et al., 2020; Tomlein et al., 2022).

Despite an extensive study of different aspects of YouTube's recommendation and search algorithms, this issue has not yet been studied from the point of view of portrayal of migration. This study is aimed to fill this gap by auditing the YouTube search and recommendation algorithms with a closer attention to the question of migration portrayal.

Research questions
This socio-technical audit aims to answer four main research questions:

1. **How migrants and refugees are represented in the top-watched YouTube video search results?**

2. **Do YouTube's search and recommendation algorithms suggest differently framed migration videos in different national settings?**

3. **Do YouTube's and recommendation algorithms suggest differently framed migration videos to migrant and non-migrant YouTube accounts?**

4. **How do individuals with a migrant background perceive the portrayal of migrants on YouTube videos?**

Methodology

To answer our research questions, we conducted an adversarial audit using a mixed method sociotechnical approach. Based on our experience in conducting audits of algorithmic systems, we have learned that the best approach to understanding how algorithms work and impact on different groups is through the combination of quantitative and qualitative approaches. YouTube is a social media platform with a high social impact on numerous personal and public dynamics. As shown in Eticas' Algorithmic Auditing Guide (Eticas, 2021), any method or process designed to open up the black box of algorithms and AI will require to go beyond and above a purely technical analysis, which would not only be incomplete but also misleading, as it may not take into account all factors, adequately consider real world contexts and underlying human factors.

Data collection

We collected data from YouTube between June and July 2022 using data scraping and sockpuppet audit methods (Sandvig et al., 2014). We identified the top-watched and recommended videos for the queries "migrants" and "refugees" on YouTube and we scraped the thumbnails, video title and description for each of them. We have limited our search to single-words to make the results more direct and consistent. We did not include vocabulary used to represent migrants with two or more words (e.g., "asylum seekers"). The use of singular forms can produce more search results, indicating their greater prevalence and relevance. For each RQ we generated different data employing a virtual agent (bot) to simulate human behavior (search query, scroll down, clicks, wait for the web elements to fully load, log in). We used a clean stand-alone version of Google Chrome with no cookies or any user references, except for RQ3.

Why did we focus on the thumbnails rather than the full video? Following the methodology used to analyze minorities' media portrayals (Bleich et al., 2015a), we focused on video **thumbnails** rather than full YouTube videos for several reasons. Thumbnails grab the viewer's attention at a first glance more than a full video. As YouTube itself notes, usually viewers will see the thumbnail and title first. It is this information that gives an idea of what a particular video is about, further influencing the decision of users whether they will click and continue to watch a particular video on YouTube or not. While we do not argue that focusing only on thumbnails is enough to give a complete picture on how YouTube portrays migrants and refugees, video images give certain advantages in its understanding.

- *To answer RQ1* **How migrants and refugees are represented in the top-watched YouTube video search results?** We scraped the 100 top-watched videos worldwide for the query "migrants" and for the query "refugees". After completing these queries,

we selected the 100 top-watched videos for "migrants" and the 100 most viewed videos for "refugees" by filtering results according to number views.

- To answer RQ2 *Does YouTube's search and recommendation algorithms suggest differently framed migration videos in different national settings?* We scraped the top-100 recommended videos for the query "migrants" using a VPN to replace the location of our IP address. The location was set to Toronto (Canada) and London (United Kingdom).

Canada has been selected as a migrant-supporting country, while the UK has been selected as a country that is less favorable to migration. We chose these two countries because both are English-speaking states, members of the Commonwealth with extensive migratory histories and common law systems. However, they differ greatly from each other in terms of their migration policy and their public attitudes towards migration. Canada ranks high on the MIPEX (Migrant Integration Policy Index) "top ten" with a score of 80 out of 100, as the country's holistic approach to integration guarantees equal rights, opportunities and security for newcomers and citizens. The UK scores 56 on a 100-point scale, as migrants in the country have more opportunities than barriers to integrate, but the state offers less favorable migration policies compared to Canada.

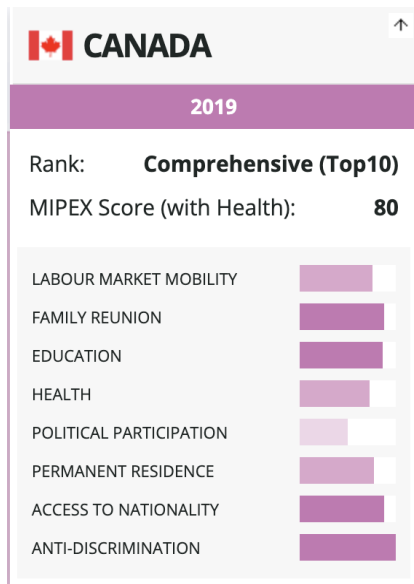**Figure 1**. 2019 MIPEX Ranking, Canada.

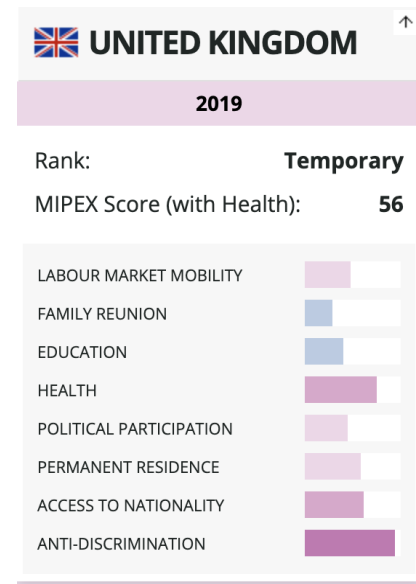**Figure 2.** 2019 MIPEX Ranking, the UK.

- To answer RQ3 *Does YouTube's search and recommendation algorithms suggest differently framed migration videos to migrant and non-migrant accounts?* We created two sockpuppet YouTube profiles: one quasi-migrant and one quasi-non-migrant. We located the accounts in two different areas of London with

varying levels of ethnic diversity.[2] We named the non-migrant sockpuppet user profile "Kate White" and, through VPN, we placed it in East London (lower level of ethnic diversity). The migrant sockpuppet user profile was named "Fatma Aydin", and we located it in Wembley, London (higher level of ethnic diversity). Both profiles were completely blank accounts with no previous search and click history. However, we added profile pictures representing their different backgrounds. For each profile, we searched for the query "migrants" and scraped the top-100 recommended videos separately.
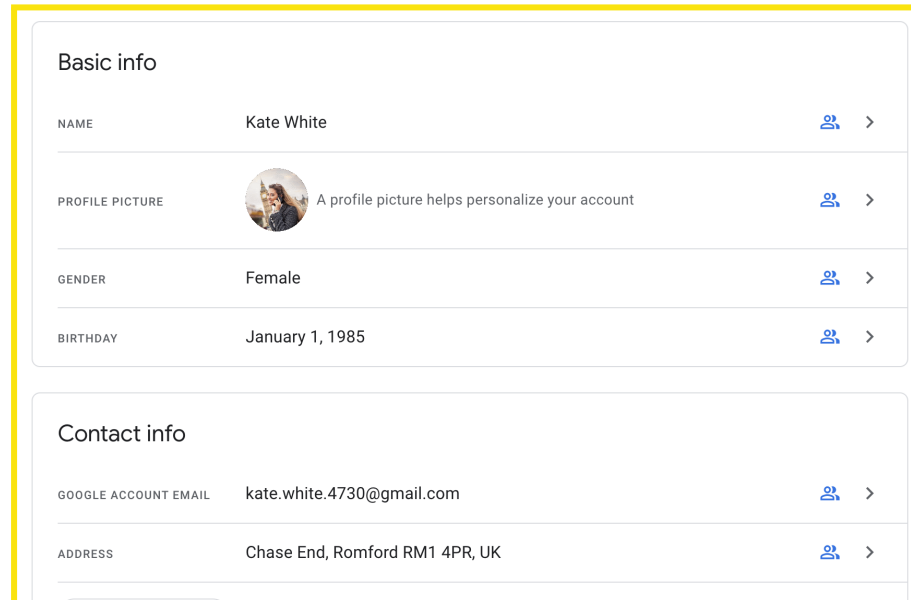

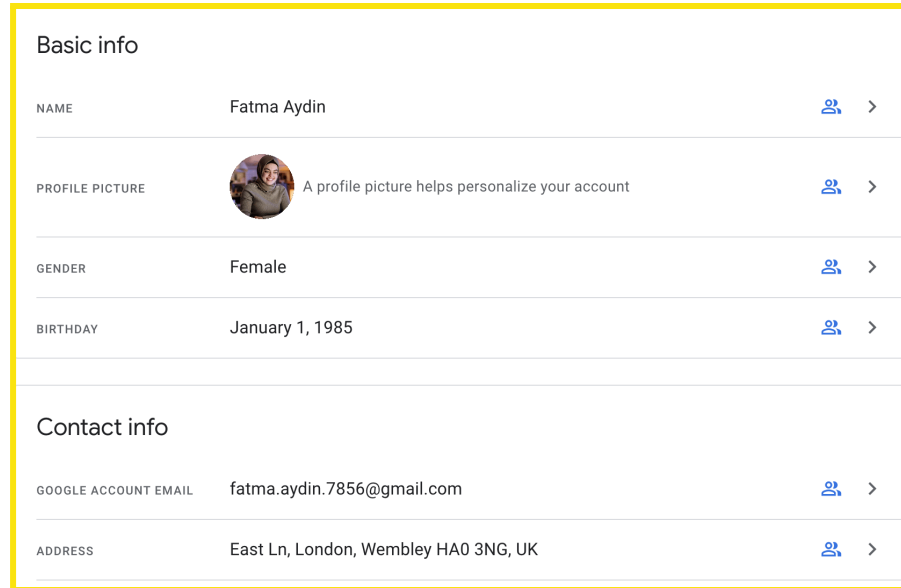**Figure 3.** Kate White, non-migrant profile information.

Figure 4. Fatma Aydin, migrant profile information.

- To answer RQ4 ***How do individuals with a migrant background perceive the portrayal of migrants on YouTube videos?*** We participated in a roundtable discussion on social media and algorithms at the "Decolonizing the Newsroom" event held in Madrid in July 2022. The discussion took place among four people that defined themselves as having a migrant background, one moderator and two researchers. At the event, general issues on the representation of migrants in traditional and social media were discussed. Participants were also shown the preliminary results of our content analysis conducted on the top 100 most watched videos worldwide. Participants were asked about their expectations, thoughts, and reactions toward the representation of migrants.

Content analysis

Content analysis was chosen as a method to analyze data as it allows for a systematic and objective examination of the data, identification of patterns, themes, and biases, quantification, and flexibility to be applied to different types of data from YouTube video thumbnails. For that purpose, we manually coded all thumbnails according to the categories defined by previous research on the mis-representation of migrants (Urman et al., 2022). The categories we used were the following:

1- Human presence (Yes/No)
2- Facial visibility (Yes/No)
3- Group size (individual, small group of 2-8, big group 8+)
4- Race (White, non-white, both, can't identify)
5- Gender (male, female, both, can't identify)

6- Age (child, adult, both, can't identify)
7- Religious symbols (present/not present)
8- Working activities (present/not present)
9- Border crossing (present/not present)
10- Protest activities (present/not present)
11- Framing (Victim, Beneficial, Problem, Other/Ambiguous)

"**Framing**" refers to how a problem is described or labeled (Gamson and Modigliani, 1989). Framing affects public opinion (Nelson and Kinder 1996; Zaller 1992). To code the framing, coders were instructed to look at the thumbnails, read titles and descriptions, and systematically note why the framing was chosen.

We recognized that while visual elements can provide rich information, they can also be open to multiple interpretations, and therefore require the support of text to be understood more consistently (Barthes, 1967; Pain, 2012). Therefore, we decided to interpret the framing using thumbnails in conjunction with their textual descriptions. We coded the dominant framing of the videos and divided into the following categories (Benson, 2013; Bleich et al., 2015):

- **Victim**: frames the unfortunate circumstances of migrants, which may evoke sympathy for them, even though it might represent without their agency taken into account (e.g. close-up images of sad faces, portrayal of poverty, crying faces, etc.);
- **Beneficial**: frames migrants/migration as contributing to society. These can be economic (e.g. hardworking migrants, successful people, etc.) or cultural contributions (added value of diversity);
- **Problem**: frames evoking fear, animosity or threat (e.g. imply migrants stealing jobs, taking the advantage of welfare systems, harming host society culture etc.);
- **Other/Ambiguous**: anything that is not covered by the first 3 frames and it is too ambiguous to encode.

Auditing YouTube: Results

4.1 Quantitative findings

4.1.1 How are migrants and refugees represented in the top-watched YouTube video search results?

Representation of migrants

In the analyzed video thumbnails for the "migrants" search, we distinguished between two main types of content: thumbnails featuring migrant people and thumbnails without migrant people. Our analysis showed that a big share of videos **(68%) depicted migrants** on the thumbnails (Table 1). Only 30% did not show migrants but rather featured politicians, the military, or others (e.g. TV, news anchors, bloggers). **31%** of all thumbnails show migrants in **groups of 16 or more people** and 19% show them in groups of 5 or less. **39%** of all video thumbnails show migrants in a way that their **faces were not visible**, while only 11% showed clearly identifiable faces. This trend contributes to the dehumanized portrayal of migration (Bleiker et al., 2013; Esses et al., 2013). The majority of the thumbnails (**44%**) depicted migrants as **non-white individuals**. In terms of gender, due to the face invisibility, in 26% of video thumbnails we could not determine the gender of the individuals, while the other **20%** represented **male** and only **5%** of all thumbnails depicted **female migrants**.

More than a half of the analyzed thumbnails (**52%**) represented migrants as **crossing borders**. 17% of the analyzed video thumbnails depicted migrants crossing sea by boats or ships. In turn, a small percentage depict migrants engaged in other activities such as working (2%) or protesting (7%). Additionally, 18% of the thumbnails depicted politicians, 17% contained armed forces, and the minimum number of thumbnails had a presence of religious symbols (5%). A significant portion, representing **34%** of all analyzed migrant-related thumbnails, was found to have **problem framing**, followed by **33%** that show migrants in **a victim frame**.

In sum, the most common portrayal of migrants in the top-watched YouTube videos is **a big group of adult non-white individuals crossing a border**, and **the facial features of these individuals are not visible**. Additionally, **migration is often portrayed in a manner that emphasizes victimization or presents it as a problem.**

Image 1. An example thumbnail with the most common features depicting migrants:
a big group of unidentifiable non-white adult individuals crossing borders.
Video title: African migrants storm border into Spain's Melilla

Representation of refugees

Similarly to the video thumbnails focusing on migrants, we found that the majority of thumbnails for the "refugees" query **(75%) depicted refugees** (Table 1). Video thumbnails without the presence of refugees made up only 17% of the top-100 "refugees" video thumbnails. Compared to the "migrants" search, the features of refugees on thumbnails were more visible. We were able to determine the **facial (32%)** and **demographic characteristics** of refugee groups. In particular, the thumbnails depicting refugees represented both genders, with **men - 14%** and slightly more **women - 21%.** In addition, the query "refugees" showed that the thumbnails featured fewer people on them. Refugees were portrayed on YouTube thumbnails mostly in **small groups of 2-4 people (29%),** followed by medium groups of 5-15 people (20%). Further, we observed a difference from the "migrants" search in that the proportion of thumbnails depicting refugees as **white individuals (39%)** was higher, followed by 31% of non-white people. For example, these thumbnails showed Ukrainian refugees, likely reflecting the ongoing war in Ukraine.

In contrast to the search for "migrants," 32% of thumbnails for "refugees" showed them crossing borders (compared to 52% in the case of migrants). Most "refugees" video thumbnails did not have a clear focus on particular activity or characteristics. Only a small percentage contained an image of refugees crossing the sea (5%) or presence of armed forces (11%). In a few instances, the thumbnails showed politicians (9%) or religious symbols (10%), and working (4%) or protesting activities (4%). The refugees thumbnails conveyed **ambiguous (50%)** and victim (40%) framings**.**

Therefore, the most common thumbnail features for the "refugee" query includes **a small group of 2-4 adult white, male and female individuals.** They are generally represented on the most watched YouTube video thumbnails **with clear face visibility,** in contrast to the dehumanized portrayal of migrants. **The refugees are not typically shown as crossing borders** or **engaging in specific activities,** and are often **framed in an ambiguous context.**

Image 2. An example thumbnail with the most common features depicting refugees:
a group of 2-4 identifiable white adult individuals
Video title: Picking up Hot Ukrainian Refugees!

In conclusion, for both "migrants" and "refugees" queries, the data indicates **a clear disparity in the representation of different groups of migrants** in the most watched YouTube videos (Table 1). It can be inferred that migrants are presented on YouTube more negatively than refugees. Migrants are usually portrayed in big groups without clear facial identification, which dehumanizes them. Moreover, it is concerning that migrants are portrayed predominantly as non-white people and framed as a problem and victims of circumstances. On the other hand, even though refugees are also shown in a victimized context, their representation is less dehumanizing as we can see their facial appearance. In addition, they are generally depicted in small groups of the white individuals, not crossing state borders.

	Data	Migrants % (out of 100)	Refugees % (out of 100)
Migrant presence	yes	68	75
	no	30	17
Facial visibility	Yes clearly identifiable	11	32
	Mixed	19	23
	No not identifiabe	39	24
Group size	individual	11	15
	small gr of 2-4	9	29
	medium gr of 5-15	19	20
	big gr 16+	31	18
Race	white	1	39
	non-white	44	31
	both	3	4
	can't identify	22	9
Gender	male	20	14
	female	5	21
	both	19	0
	can't identify	26	0
Age	minor	2	6
	adult	31	43
	both	18	28
	can't identify	19	6
Working Activity	yes	2	4
	no	68	77
Protest activity	yes	7	4
	no	62	77
Border crossing	yes	52	32
	no	14	40
Crossing by sea	yes	15	5
	no	55	76
Religious symbol	yes	5	10
	no	93	89
Armed forces	yes	18	11
	no	79	89
Politicians	yes	17	9
	no	83	91
Framing	Victim	33	40
	Beneficial	3	4
	Problem	34	6
	Ambiguous/Other	30	50

Table 1. Migrants' and refugees' representation in the top-watched YouTube videos

4.1.2 Do YouTube's search and recommendation algorithms suggest differently framed migration videos in different national settings?

Portrayal of migrants in London

In analyzing thumbnails for the "migrant" query in London, we noted two main groups of thumbnails: images with the presence and absence of migrants. The largest number of video thumbnails **featured migrants (78%)** and only 21% did not show them (Table 2). Similarly to the findings in RQ1, migrant people were depicted in **medium (31%)** or **big groups (30%)**. Additionally, in a bigger percentage of the thumbnails **(42%) the faces were not clearly identifiable.** While nearly half of the thumbnails showed migrants as **non-white individuals (49%)**, only 4% were of white race. As for gender, just **1%** of the migrants shown were **women**, while 18% were men. The main trend found in the video search in London featuring migrants was that in more than half of the thumbnails (**54%**) migrants were presented at the **border crossing**. Compared to RQ1, the search in London showed slightly more videos of migrants crossing a sea (24%), but most (54%) did not depict sea passage. Other themes in the video thumbnails included depictions of armed forces (19%), politicians (7%), working (2%) or protesting activities (3%), and religious symbols (4%). The majority of the video thumbnails for "migrant" query in London were presented in a **victim framing (43%)**, followed by an ambiguous framing (36%). In turn, the rest of the videos are framed as a problem (19%) and **only 2%** represent migrants in **a beneficial framing**.

Image 3. An example thumbnail with the most common features for "migrants" search in London: a group of adult non-white individuals crossing a border.
Video title: Migrants at U.S. border despair over asylum rule

An analysis of all "migrants" video thumbnails collected by geolocation in London showed that most of the video images have the following most common features. These general trends portray migrants as **a medium or big group of adult non-white individuals crossing a border**. In addition, we found that the recommended YouTube videos generally portray migrants as **victims,** with a lack of beneficial representation. The tendency is in line with the results of RQ1. The next test will examine the recommendations received by the Toronto context to see if they are different from the search results received in the London location.

Portrayal of migrants in Toronto

As with the analysis of the London video thumbnails, the largest amount of video thumbnails scraped from Toronto's location contained **images of migrants (86%)** (Table 2). Similarly to the London exercise, migrant people were depicted in Toronto in **big (37%) or medium (32%) groups of people**, the **faces were not clearly visible** in a significant share of thumbnails (46%), and more than half of the thumbnails represented migrants as **non-white individuals (54%)**. The largest proportion of videos from Toronto depicting migrants showed them **crossing the border (70%),** larger than in the London search results, but only 20% showed migrants crossing by sea. A smaller percentage of video images contained armed forces (30%), with only a few - politicians (2%). No religious symbols were presented. For the most part, migrants in the Toronto search were framed generally as **victims (49%)**, followed by ambiguous (27%) and problem framings (22%).

As a result, while analyzing video thumbnails scraped in the Toronto exercise, we observed very similar results to those in the London trial. The most common depiction of migrants in Toronto's YouTube suggested video thumbnails also suggests that they are represented as **a medium or big group of adult non-white individuals crossing a border**, generally shaped in a **victim framing**.

Image 4. An example thumbnail with the most common features for "migrants" search in Toronto: a group of adult non-white individuals crossing a border.

Video title: How U.S. immigration policy affects fate of migrants braving the deadly Darien Gap

In summary, we can highlight that the results of the two exercises for Toronto and London were very similar, which does not support our hypothesis for RQ2 that YouTube's search and recommendation algorithms discern between different national contexts. Instead, both profiles received similar results from the YouTube algorithm system, with a majority of thumbnails framing migrants predominantly as victims, in medium 5-15 or big 16+ groups of adult non-white individuals with unclear face visibility and crossing a border. The conclusion for RQ2 is that YouTube's recommendation system does not seem to take into account national migration context when recommending content. Instead, certain types of migration-related content, particularly those that depict migrants in a disadvantaged light, appears to be prioritized by YouTube's system, regardless of national migration context.

	Data	London % (out of 100)	Toronto % (out of 100)
Migrant presence	yes	78	86
	no	21	13
Facial visibility	Yes clearly identifiable	15	9
	Mixed	21	31
	No not identifiabe	42	46
Group size	individual	5	6
	small gr of 2-4	12	11
	medium gr of 5-15	31	32
	big gr 16+	30	37
Race	white	4	3
	non-white	49	54
	both	3	2
	can't identify	22	27
Gender	male	18	16
	female	1	4
	both	32	36
	can't identify	27	30
Age	minor	2	2
	adult	33	26
	both	20	26
	can't identify	23	32
Working Activity	yes	2	2
	no	75	84
Protest activity	yes	3	4
	no	73	81
Border crossing	yes	54	70
	no	16	14
Crossing by sea	yes	24	20
	no	53	65
Religious symbol	yes	4	0
	no	92	99
Armed forces	yes	19	30
	no	78	69
Politicians	yes	7	2
	no	93	98
Framing	Victim	43	49
	Beneficial	2	2
	Problem	19	22
	Ambiguous/Other	36	27

Table 2. Portrayal of migrants in London and Toronto

4.1.3 Do YouTube's search and recommendation algorithms suggest differently framed migration videos to migrant and non-migrant accounts?

Kate White (non-migrant account)

When performing the search query for "migrants" using Kate White's sockpuppet account, we found that **76%** of the videos suggested for Kate White included **images of migrants** (Table 3). The migrants were generally depicted in a **medium group of 5-15 people (33%)** and **big 16+ groups (26%), without clear face visibility (42%).** Nearly half of migrants depicted were **non-white individuals (48%)**. A significant share of these video thumbnails represented migrants **crossing borders (48%)**, similar to the other searches we performed in previous trials. A smaller amount contained other characteristics or activities, which included slightly more video thumbnails, where migrants cross a sea (25%), a fewer thumbnails with presence of armed forces (17%), politicians (8%), religious symbols (3%), working (2%) and protesting activities (3%). In the search results from a non-migrant profile, there is a trend towards a victimizing tone in migrant content and generally displaying them as **victims of circumstances (43%),** as in all previous RQs.

Taking into account the most common features, we observed that the most recommended videos in the non-migrant sockpuppet profile Kate White, as in previous RQs, portrayed migrants in **a medium-big group of adult non-white individuals crossing borders**. The subtext that dominated in the video thumbnails is **a victim framing**. The next test examines the top-recommended search results for the migrant sockpuppet profile to see if they are different from the recommendations received by Kate White.

Image 5. An example thumbnail with the most common features for "migrants" search for Kate White profile: a group of adult non-white individuals crossing a border.
Video title: African migrants storm border into Spain's Melilla

Fatma Aydin (migrant account)

Fatma Aydin's YouTube search for the "migrant" query showed a high number of video thumbnails **featuring migrants** (**76%**), the same number as in the non-migrant profile (Table 3). Similarly to Kate White's results, migrant people were depicted in a dehumanized manner, often represented in **big (28%) or medium (31%) groups of people**, with their **faces not clearly visible** in a significant share of thumbnails (**38%**). Additionally, almost half of the thumbnails represented migrants as **non-white individuals (49%)**. As with Kate's exercise, the bigger proportion showed migrants **crossing borders (44%)**. Similar to the non-migrant account, only 24% of thumbnails depicting crossing at sea appeared in Fatma's search. The remaining portion of video thumbnails exhibited other activities or characteristics, containing images with presence of the armed forces (18%), politicians (8%), religious symbols (4%), and very little proportion of working (1%) and protesting activities (4%). In turn, **victim framing (41%)** prevailed, followed by ambiguous (36%), as in the case of the non-migrant's trial.

In sum, the most common features of migrant-related thumbnails in the YouTube search and recommendation results for migrant account Fatma Aydin was nearly the same as that received by the non-migrant profile, Kate White. This suggests that the migrants were shown generally in **a medium-big group of adult non-white migrants crossing a border**. The overall tone of the thumbnails framed migrants as **victims** of circumstances.

Image 6. An example thumbnail with the most common features for "migrants" search for Fatma Aydin profile: a group of adult non-white individuals crossing a border.
Video title: What migrants face as they journey through the deadly Darien Gap

After conducting the exercises involving the non-migrant and migrant accounts, Kate White and Fatma Aydin respectively, we found that the results were very similar. This does not maintain the hypothesis for RQ3 that different user backgrounds would receive different search and recommendation results for the "migrant' query. Both profiles received similar

video recommendations from the YouTube algorithm, with a majority of videos framing migrants predominantly as victims, in medium-big groups of non-white adults crossing frontiers. The conclusion is that YouTube does not seem to differentiate between non-migrant and migrant users in terms of the content it promotes through its search and recommendation algorithms. Instead of prioritizing content that strongly supports or opposes migration and creating a polarizing dynamic between local and migrant users, the algorithm appears to portray migrants as dehumanized and victimized regardless of the user's background.

Data		Kate White (non-migrant account) % (out of 100)	Fatma Aydin (migrant account) % (out of 100)
Migrant presence	yes	76	76
	no	23	23
Facial visibility	Yes clearly identifiable	17	21
	Mixed	17	17
	No not identifiabe	42	38
Group size	individual	6	5
	small gr of 2-4	11	12
	medium gr of 5-15	33	31
	big gr 16+	26	28
Race	white	4	5
	non-white	48	49
	both	3	4
	can't identify	21	18
Gender	male	19	23
	female	2	1
	both	27	30
	can't identify	28	22
Age	minor	2	2
	adult	38	40
	both	17	18
	can't identify	19	16
Working Activity	yes	2	1
	no	73	73
Protest activity	yes	3	4
	no	72	68
Border crossing	yes	48	44
	no	19	17
Crossing by sea	yes	25	24
	no	51	51
Religious symbol	yes	3	4
	no	94	94
Armed forces	yes	17	18
	no	78	79
Politicians	yes	8	8
	no	92	92
Framing	Victim	43	41
	Beneficial	2	2
	Problem	21	21
	Ambiguous/Other	34	36

Table 3. Recommended YouTube videos for Kate White and Fatma Aydin

4.2 Qualitative findings

4.2.1 How do individuals with a migrant background perceive the portrayal of migrants on YouTube videos?

The roundtable discussion identified some critical issues that need to be explored more systematically and addressed at institutional level. The first concern of all participants was that **migration in social media** is portrayed and boosted in **a negative light**, usually framed as a **problem.** Content portraying migrants or refugees in a positive way does not reach the audience. For example, one participant mentioned that his ads on positive initiatives about migrants and migration had very little engagement. This has led to the feeling that content picturing a positive portrayal of migrants is being silenced by social media rather than being promoted. Another participant pointed out that users need to pay to increase the views of their posts, which affects the visibility of projects with lower fundings or people with fewer resources to invest.

Another issue that was mentioned was the representation of migrants in **large groups,** which perpetuates their perception as a **danger** or **threat**. One participant gave an example of a sentence she frequently heard: *"People in Spain say: "The migration that we had in the 80s is normal, only one or two people came to us, now that there are a lot of them, this is a problem*." Often such big groups of migrants are compared on social/media to a "**wave**", "**tsunami**" or preceded by the phrase "**they are coming!**", thereby picturing them as an anonymous mass and further reinforcing a negative overtone. This representation is also related to the portrayal of migrants in most videos in a **border crossing** setting, which many perceive as if they are **invading their homes**. At the same time, showing migrants in such big groups makes it difficult to recognize any humanizing feature. All these aspects bring us back to the theory of **dehumanization** of migrants and refugees in the media ([Bleiker et al, 2013](#); [Esses et al., 2013](#)). On the other hand, participants felt that portraying migrants as victims carries a **negative connotation**, meaning that they are seen as recipients of charity lacking agency, unable to help themselves, and in need of being saved.

Members of the discussion group felt the problem of the negative portrayal of migrants is worse in **mainstream media**, rather than social media. In their opinion, YouTube or any other social media content is moderated, but the **voices of migrants are often underrepresented** and used for political ends. Participants pointed out an example of migrants being interviewed, and journalists misinterpreting their stories to fit their agenda or their media channel's narrative.

Participants perceived that social media algorithms strictly divide and present content into two distinct categories: **migration success stories** and **migration failure stories**. On one hand success stories are often depicted as being the result of luck or talent, rather than the

result of hard work and effort. These stories are often presented as embodying the "American or European dream". On the other hand, stories about migration failures are often presented in social media in a way that evokes feelings of grief and sorrow, and are perceived as a reminder that there are others who are worse off than they are. These stories can be powerful tools for shaping public opinions and attitudes toward migration, and can have significant consequences for migrants themselves. Participants pointed out that these stories and the negative image of migrants boosted by social media has negative effects on their **well-being and mental health**.

Speaking specifically about **refugees**, participants emphasized the **double standards** in social media regarding current political events. For example, one of the participants assumed that when searching for "Ukrainian refugees" and other refugees, the images and narratives would be completely different than when searching for "migrants".

On the whole, participants in the roundtable expressed important concerns about negative or otherwise problematic migrant portrayal on social media, but acknowledged the potential for social media to provide a more positive representation of migrants compared to mainstream media. Perception questions addressed to migrants themselves are important as, ultimately, on the one hand, we can witness the level of migrants' trust in social networks, including YouTube, which also affects their engagement and use of these social networks. On another hand, this aspect will further have an indirect impact on the general public understanding of migration issues. This would be one-sided comprehension given that migrants would have less trust and therefore will use less and be underrepresented on social media. And, consequently all this will have a major impact on the quality of the data that the platform displays and distributes.

Discussion and recommendations

Through our analysis, we tested the search and recommendation algorithms of the YouTube platform, in particular how it spreads information about migrants and refugees. When we launched the Adversarial Audit of the YouTube algorithm, we had concerns about the discriminatory and biased representation of migrants on social media, given previous research on the topic. On the one hand, some of our concerns were not confirmed. For example, we found that, contrary to our initial expectations, national contexts and personal background do not influence search results on YouTube. On the other hand, we found other concerning evidence in that the YouTube algorithm tends to portray migrants in a negative light across different contexts and profiles, which can further affect both public opinion at large and the migrants themselves. Both qualitative and quantitative findings supported and reinforced this observation.

1.   YouTube shows migrants in a negative light

We are concerned about results for migrants representation in the most watched and recommended YouTube videos. In all of our experiments, migrants were most often portrayed in a similar way on YouTube: a big or medium group of non-white individuals crossing the border without a clear face visibility.[3]

First, this finding helped us to identify and validate an alarming trend, already discussed in previous studies, where migrants are visually portrayed on YouTube in a highly **dehumanized way** ([Bleiker et al., 2013](); [Esses et al., 2013]()). The lack of personalized representations of migrants and the dehumanized depictions of migrants in social media prevents the public from empathizing with them ([Bleiker et al., 2013]()). This can contribute to negative public attitudes toward migrants and migration. The latter can include the amplification of xenophobic and racist sentiments, which can have serious consequences for the individuals and communities affected.

Second, we found that YouTube's algorithms present migrants mostly as individuals **crossing borders.** This also confirms the stereotype of migrants crossing frontiers and links migration to notions of "invasion", "they are coming!", "threat" to the sovereignty or security of the host state ([Bleiker et al., 2013]()).

Third, most of the YouTube video thumbnails depict migrants as **victims** of circumstances. The portrayal of migrants as victims is complex and potentially dangerous. Some scholars argue that framing migrants in the victimizing way can serve to highlight the challenges and hardships that they face ([Benson, 2013;]() [Bleich et al., 2015b]()). By drawing attention to the

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[3] We recognize that the faces of migrants may be hidden in an attempt to protect their privacy, however, we have not observed cases where this would be obvious using any face hiding techniques.

asperities that migrants endure, such as discrimination, violence, or economic insecurity, victim framing can generate empathy and support for their plight. This can be especially important for migrants who may be marginalized or overlooked in mainstream discourse. However, there are also potential drawbacks to using victim framing in relation to migrants. One may view it as negative because it could **reinforce stereotypes** and **prejudices about migrants**, such as the idea that **they are weak or dependent** and **lack agency** (Banulescu-Bogdan et al., 2021; Haw, 2021; Smets et al., 2019). This could have harmful effects, as it could perpetuate discriminatory attitudes and policies towards migrants. Moreover, as the roundtable discussion showed, migrants may not want to be portrayed as victims, as it could be seen as derogatory or condescending. They may prefer to be depicted as strong and resilient, with agency and autonomy, rather than as passive recipients of aid or victims who need to be rescued.

Fourth, migration-related YouTube video **content featuring politicians** were predominantly **with problematic frames**, which should also be alarming. Given the growth of political actors of the right wing, migration topics are being discussed more widely in social media (Heidenreich et al., 2020). More than that, such politicians get more promotion by social media algorithms and get more visibility in the feed (Huszár et al., 2021). The trend that politicians shown on YouTube's videos carry negative attitudes towards and frame migration as a synonym of "problems" for countries, can lead to an even more negative attitude towards migration among YouTube's audience and the public in general.

Finally, our observation of **a lack of videos** on YouTube showing **beneficial framing or portrayal of migrants as successful** is another cause for concern. The scarcity of favorable depictions of migration on YouTube and other social media platforms could have harmful effects. By focusing on negative or victimizing narratives, the platform reinforces adverse stereotypes and prejudice about migrants, without striving for the social change narratives about migrants and refugees need. Moreover, it could limit the ability of migrants to talk about themselves in a more nuanced and positive light, potentially hindering their social and economic opportunities.

2. YouTube presents biased results for different groups of migrants

We are concerned that YouTube's algorithms present bias and double standards towards two groups of migrants in the most popular YouTube videos, in particular, between refugees and migrants. Refugees are portrayed by YouTube in a more humanized way compared to "migrants". Accordingly, we can see more of their facial appearance and, unlike migrants, they are shown in small groups of white individuals, not crossing state borders.

As it is important to consider the context in which the data was collected when interpreting the results, it is possible that the 2022 Ukrainian refugee crisis may have influenced the results of the data collection for the "refugees" query. The videos were scraped in 2022, so the current events and trends at the time had an impact on findings. The media has

developed a more favorable attitude towards Ukrainian refugees compared to refugees of other nationalities (Asylum Access, 2022). This was peppered with racist and xenophobic rhetoric about refugees and migrants from the Middle East and Africa, and pursued hostile policies such as border pushes and draconian detention measures (Global Detention Project, 2022; The United Nations, 2022). Our assumption is that the query "refugees" on YouTube in RQ1 mostly showed white refugees because they are likely to be Ukrainian refugees. This has apparently influenced the fact that refugees are represented more positively than other migrants in the data, who are probably of different nationalities. This concern is supported by one of the participants in our discussion that the results of the search will be different if Ukrainian refugees are considered.

In light of the above, **we recommend**:

- Although YouTube started to address a number of social issues raised in previous years, the search and recommendation algorithms still show certain biased content. In particular, as our audit study found, YouTube needs to further develop its algorithms for better representation of minority groups, such as migrants. The capability to **independently audit search, ranking and recommendation algorithms used by** YouTube and other social networks is a high priority in addressing the issues. This is important as social media has a huge impact on minorities and society at large. The inclusion of an independent audit of social media platforms would not only confirm the correct functioning of a particular system, but also allow independent researchers to identify possible harmful effects of its algorithms. Social media audits will further help to build trust and hold technical systems accountable when needed. Whereas government agencies can and should take the lead in promoting responsible data practices.

- The second critical issue is **the lack of transparency of the algorithms** of YouTube and other social networks. Given the high impact and opacity of the algorithms they use, social media platforms need to share transparency reports to give deeper insights into the algorithmic issues and overview the progress made towards addressing bias, discrimination and other concerns. In connection with this, researchers should also be able to test and validate social media algorithms to help improve them. For this purpose, YouTube and other social platforms should **facilitate researchers or research institutions in accessing necessary internal data** in order to study the possible harm or risks that their algorithms can bring. Indeed, the reliability of researchers' access to internal data should also be taken into account, and conditions for compliance with data protection and security protocols has to be observed.

- A collaborative effort by public institutions, experts and YouTube itself should better **define the set of biases that should not be present in YouTube's algorithm system,** including those based on gender, race, ethnicity, and other factors. As our study

showed, YouTube's algorithm system has gaps in its ability to track biases and stereotypes related to the representation of migrants and refugees, often framing them in a stereotypical and victimized manner. In this regard, it is necessary to develop a more accurate, decolonized, and anti-stereotypical migration terminology that can positively represent interests of migrants in social/media contexts. This should be based on careful research and consultation with experts and members of the affected communities, and should aim to avoid perpetuating harmful stereotypes or biases. It should also be regularly reviewed and updated to ensure that it remains relevant and effective.

● **Engaging communities of migrant people and refugees** is key to design better systems and moderation processes on social media. People with migrant and refugee backgrounds must be involved in the activities with public institutions and platforms to effectively address the issues related to their own representation. While YouTube already has some instruments that attempt to prevent mispredictions, it should also include deeper engagement with marginalized communities. To do this, YouTube should design its feedback or reporting tools in a way that allows migrants or any other minorities to actively shape their experience (Mozilla, 2022), while user feedback should have more weight in determining which videos are recommended.

Limitations

The purpose of conducting any research is to increase our understanding of the world around us and to uncover new insights and knowledge. However, it is important to recognize that all research has limitations, which can affect the accuracy and reliability of the research findings. These limitations can arise from a variety of sources, such as the methods used to collect and analyze data, the sample size and population studied, and the inherent biases and assumptions of the researchers. It is essential to acknowledge and understand these limitations in order to properly interpret and evaluate the results of a study, and to recognize the potential limitations of the research in the context of its broader implications and applications. Our report has several limitations related to its methodology and analysis:

1. Our report does not cover the global migrant picture, as we **focus only on single-word queries** (excludes queries e.g. "asylum seekers") to make the results more direct, consistent and unbiased. This means that our findings may not be representative of all types of migrants or the broader issue of migration. Despite this, we believe that our study provides valuable insights into the use of YouTube data to understand public perceptions and attitudes towards migrants.

2. We **used country-specific data** as a benchmark and focused on two countries with significant migration backgrounds, the UK and Canada (RQ2), in order to test the effects of geolocation on research results. The impact of geography on social media's portrayal of migration is a promising direction for future research. Subsequent studies could benefit from the inclusion of more countries with different perspectives on migration and more robust geographic data to provide a more comprehensive assessment of the representation of migration in social media analysis results.

3. We relied on the use of two **sockpuppet YouTube accounts** with no previous search or click history (RQ3). This small sample size may not be representative of the wider population and does not allow for controlling for other factors, such as the user's location, language, or demographic characteristics. Additionally, the use of sockpuppet accounts may not accurately represent the real users' behavior and capture the full range of search results or recommendations that YouTube provides to actual users with more diverse histories and preferences.

4. We chose to focus on **YouTube's search and recommendation algorithms**, since these are important features that allow for users to actively discover content. However, this only captures one way in which algorithms on YouTube shape perceptions of migration. Future research on this topic could further explore other algorithmic influences on migrant portrayal on social media.

5. Our study only **examined the three components** of YouTube content: the video thumbnails, titles and description. However, we did not consider other aspects of YouTube videos, such as the full video content, user reactions in the comments, hashtags, and other metadata. This limitation of our study suggests potential directions for future research.

6. Our data collection took place during **a specific time period** (June and July 2022) and may not necessarily reflect the representation of migrants and refugees at other times. The context of the 2022 Russia-Ukraine war may have had an impact on the results of our study, specifically the results of RQ1. While this helped us identify the presence of biases in YouTube's algorithms, using a longitudinal research approach that involves collecting data over a longer period of time can provide valuable insight into how robust these biases are in YouTube's algorithms and how they can evolve or change over time.

7. Using only English-language YouTube video data in a study can cause limitations. The use of **single-language data** may have restricted the ability to generalize the results to other contexts and may not accurately reflect the diversity of global population perspectives.

8. While we argue that there is strong evidence for the existence of prejudice against migrant groups on YouTube, our work does not focus on investigating **why these issues occur**. Further research may benefit from examining the causes, it can help prevent unequal treatment of individuals and groups, address existing social prejudices and inequalities, and inform efforts to reduce or eliminate bias in algorithms.

Conclusion

YouTube has a huge impact on the daily lives of the entire population of the planet, given that it is the second most popular social media platform in the world with a multibillion audience. At the same time, the platform is increasingly on par with traditional media, playing a key role in informing the public about global issues and events, and becoming a critical platform for "visual journalism". All this points to the need to explore how the migrant population, a group which has often been ignored or portrayed in a negative light in the mass media, are represented in YouTube's growing content.

Our research highlights the problem of biased and disadvantaged portrayal of migrants and refugees on YouTube, which has not been previously studied in the context of this platform. The study showed that YouTube's search and recommendation algorithm produce similar results regardless of the location or personal background of the user. Instead, YouTube appears to promote certain types of migration-related content, particularly those that depict migrants in a negative light across different contexts. Yet, we observed a bias in the way that migrants and refugees are represented in most watched and recommended YouTube videos. Migrants are portrayed more negatively, often in a dehumanized manner and predominantly as non-whites in problematic and victim frames. In contrast, refugees are generally portrayed as small groups of white, identifiable individuals. Moreover, continuing the mass media narratives, migration in general tends to be portrayed negatively in all YouTube content. In the videos analyzed, migrants were predominantly portrayed as victims in the form of big or medium-sized groups of non-white individuals crossing a border without a clear visibility of their faces, which exacerbates their dehumanization and stereotyping. All this brings up the question of the further impact on public perception of migration. By highlighting negative or demeaning narratives about migrants, YouTube's algorithm could perpetuate harmful stereotypes and biases.

The report suggests that YouTube and other stakeholders should work to address the biases found in their algorithmic systems, including providing greater transparency and engaging more with migrants themselves. This could help improve the representation of migrants and refugees on the platform, and provide a more balanced view of migration-related issues. By addressing these issues, YouTube and other stakeholders could create a more inclusive and fair platform for all users.

Indeed, our audit showed only a minuscule piece of the overall puzzle and had certain limitations, however, the issue of discrimination and biased content on the topic of migration on YouTube exists and needs further exploration and action in order to improve algorithmic systems of the platform and protect minorities from misrepresentation on social media.

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