

The Topics and Themes within Incel Forums

Max Sossin (20110466) | Anirudha Verma (20128760)

Supervisor: Dr. David Skillicorn

Introduction and Background	2
Methods	2
Pre-processing	2
Topic Extraction Techniques Tried	2
BERTopic	4
BERTopic Parameter Tuning	4
Results	5
Introduction	5
Blackpill Theme	8
Suicide	8
Violence	9
Looksmaxxing Theme	10
Racism and White Supremacy	11
Conclusion and Future Work	12

Introduction and Background

Incels, which stand for involuntary celibates, is a term for young men that are part of an internet subculture that revolves around these men being unable to form romantic relationships with women. Persons related to the Incel movement have been involved in several violent attacks and acts of terrorism since 2014, such as the Toronto van attack in 2018. Governments and law enforcement agencies around the world have started to pay closer attention to the Incel community because of these attacks, and, in 2020 an individual was charged with a terrorist offence relating to the Incel ideology in Canada for the first time. Since Incels are still a relatively new subculture, there is a lack of awareness about their motives, ideology, and danger level. For this project, a web scraper developed by a previous team scraped forum post data from the Incel forums on the dark web over a period of time. The purpose of this project was then to analyze this post data using NLP (Natural Language Processing) techniques to determine the main topics of discussion and the general themes and nature of those discussions. This project was open-ended in nature. The overall goal was to learn as much about the Incel community as possible. However, special importance was placed on finding themes and topics relating to violence and white supremacy.

Methods

Pre-processing

Before the Incel post data could be analyzed for topics and themes, it needed to be pre-processed. The data was in text file format and came in the form of a spreadsheet containing the post text as well as a variety of other pieces of data such as the author of the post and the date when it was posted. The first preprocessing step was to convert the text file to a CSV formatted file and extract only the column that contained the post text. Once the post text was extracted, it was stripped of all HTML tags, numbers, hyperlinks, and punctuation. When a specific post was a reply to a previous post, the previous post was included in the text along with the reply. The original post text contained in the reply was removed to not bias any term frequency calculations. The pre-processed text data was then exported in a list format to be used for topic extraction. All of these preprocessing operations were done using the python programming language and various packages.

Topic Extraction Techniques Tried

Several different techniques were tried to obtain the best topics from the Incel discussion form posts. The first set of techniques involved vectorizing the post data and then doing a number of dimension reduction and clustering operations on the vectorized data. Text vectorization

describes the process of creating numerical representations of text data. Many different techniques can be used for text vectorization, but the one chosen for this project was the Bag of Words (BoW) term frequency method. With the BoW model, the text is represented with a matrix that contains the frequencies of every word in the document. Since millions of posts were used for the analysis, the resulting BoW matrix was very large and sparse which would make clustering very difficult.

Singular Value Decomposition (SVD) was used to reduce the dimensionality of the matrix to 2, and the resulting two-dimensional matrix was clustered using Density-Based Spatial Clustering of Applications with Noise (DBSCAN). This approach produced interesting results but it was difficult to extract enough information from the clusters to create coherent topics, and the main clusters tended to contain very similar words which made differentiation of the clusters difficult. There was also extensive parameter tuning needed for both SVD and DBSCAN which made the process very time-consuming especially when trying the technique on a larger number of documents.

The next approach that was tried was Latent Dirichlet Allocation (LDA) which is an unsupervised topic modelling technique. LDA works by setting out several topics and then trying to assign each unique document to a topic based on the words contained in the document. LDA produced topics that were more coherent and easier to interpret than the approach of DBSCAN and SVD, however, there is no standardized way of choosing the number of topics for LDA. The approach used to choose the number of topics was to run the LDA model with a multitude of different numbers of topics and then compare the resulting coherence scores to try and determine the optimal number. The coherence score is a statistical measurement in topic modelling that tries to measure how interpretable a specific group of topics is to a human. However, we found that the coherence score was a relatively arbitrary metric and topic numbers that resulted in higher scores didn't always create topics that were highly differentiated or contained useful information.

After LDA, Non-Negative Matrix Factorization (NMF) was tried in an attempt to create more interpretable topics. NMF works very similarly to LDA except it creates topics by splitting the original word matrix into a matrix with the topics found and a matrix with the weights for those topics. NMF suffers from the same weakness as LDA however, since the number of topics needs to be chosen beforehand, and there is no standardized way to determine the optimal number of topics. The topics found by NMF tended to be slightly more coherent and interpretable than those found by LDA but not by much, and there was still a clear lack of differentiation among the topics. As these older clustering and topic modelling techniques weren't delivering satisfactory results, we spent time researching newly released papers describing more modern techniques that could deliver better results. Through this research, the topic modelling tool

“BERTopic” was discovered. BERTopic created topics that were far more coherent than those created with any of the techniques described above, so going forward with the project it was decided that BERTopic would be the main topic modelling technique used.

BERTopic

The topic extraction tool that produced the best results was a library called BERTopic, which was developed in 2020 by Maarten Grootendorst. BERTopic leverages BERT sentence embeddings and c-TF-IDF weighting to create denser clusters that are more easily interpretable. BERT, which stands for Bidirectional Encoder Representations from Transformers is a language model developed by Google. BERT uses Transformer, which is an attention mechanism that can learn the contextual relations between words in a document. Unlike other models that read words from a document sequentially, BERT reads the entire sequence of words at once which allows the model to determine the context of the word from all of its surroundings. BERTopic uses BERT sentence embeddings to create numerical representations of all the documents. This results in a large sparse matrix with a high dimension, so BERTopic uses UMAP to reduce the dimensionality of the matrix. UMAP, which stands for Uniform Manifold Approximation and Projection, creates a low dimension projection of high dimensional data by modelling it using a fuzzy topological structure. After the dimensionality of the data was reduced, it was clustered using HDBscan. HDBscan is an extension of the DBscan clustering algorithm that transforms it into a hierarchal clustering algorithm. HDBscan extracts a flat clustering from the hierarchal clusters by using a technique based on the stability of the clusters. Once the clusters have been created, a modified version of TF-IDF is used to extract the most important words in each cluster of documents. TF-IDF is a weighting that determines how relevant a word is to a document in a collection of documents, and it does this by multiplying the number of times a word appears in a document by the inverse frequency of the word across the whole corpus of documents. BERTopic treats all the documents in a single cluster as a single document and then applies TF-IDF, which allows the most important words in each cluster to be extracted.

BERTopic Parameter Tuning

Once BERTopic was chosen as the preferred topic modelling tool, the parameters had to be tuned effectively to best fit the Incel forum post dataset. Firstly the set of stopwords had to be specified, which is the set of words that are filtered out before performing natural language processing on documents. First, a pre-existing list of English stopwords was used, containing “and”, “the” and other similar words that convey very little information. Over time more words were added to the list as they showed up in topics and didn’t add information, for example, terms such as “op” standing for the original poster.

Next, the minimum topic size was chosen which determines the number of topics created by BERTopic. For topic modelling purposes, 400-500 topics are usually the sweet spot since having many more topics than that makes interpretation harder. After experimentation, a minimum topic size of 300 was discovered to produce a total of 400-500 topics consistently for the dataset. A custom ngram range of (1,2) was also used to allow topics to contain individual and pairings of words. It is possible with BERTopic to use custom UMAP models and sentence transformers instead of the default, but for the purposes of this project, the default settings were kept so no additional bias would be introduced to the results. The parameter “nr_auto” was set to true so that BERTopic would automatically combine topics that were quite similar, resulting in fewer and more widely differentiated topics.

Results

Introduction

The BERTopic model was run a multitude of times on a document set ranging from ten thousand to two million posts. There was an attempt to run BERTopic on the entire 5 million post dataset however it proved to exceed the computational capacity that we had available to us. Instead, smaller chunks of around half a million posts were fed into BERTopic to get a representative sample of all the topics discussed in the Incel forums. After comparing these chunks it was clear that the topics stayed relatively consistent over time, and that the topics extracted from the first 500,000 posts were representative of the entire dataset. To illustrate the data, we presented it in an Intertopic Distance Map to understand key topics and the percentage of the forum that discusses select topics. This can be seen in the figure below.

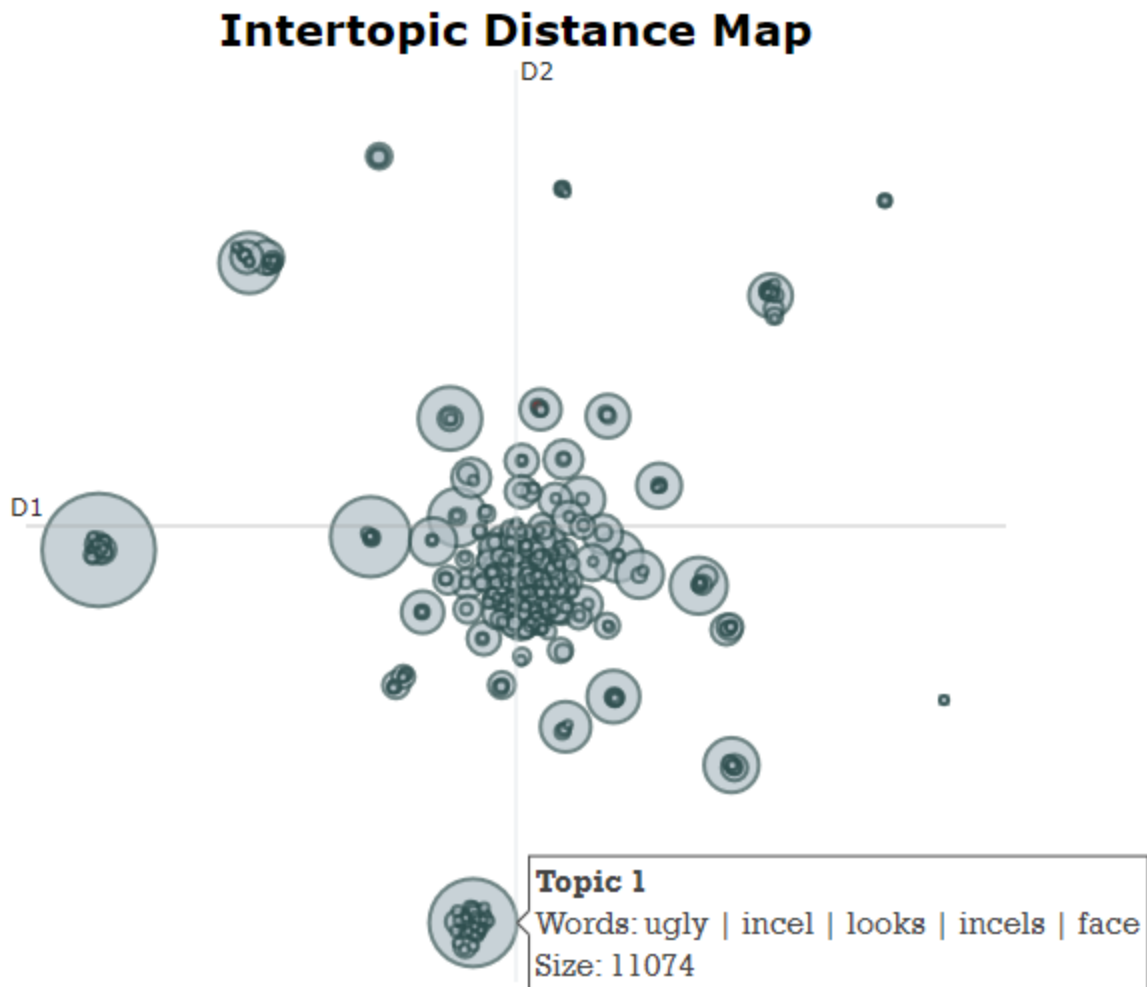


Figure 1: Interstopic Distance Map of 500,000 posts

To further our understanding of each topic we used Topic Word Scores to break down each topic into its components. This allowed us to study a topic in detail and gave us an opportunity to give meaning to the slang used within the community.

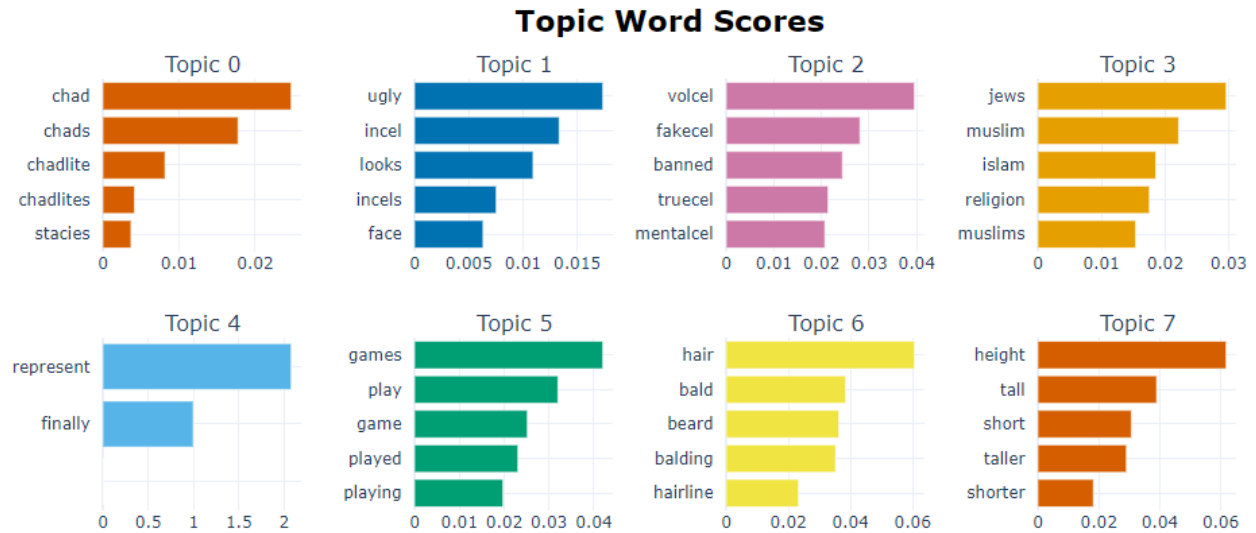


Figure 2: Topic Word Scores of 500,000 posts

To tie all the topics together, we utilized hierarchical clustering of each topic to separate each topic into its related categories.

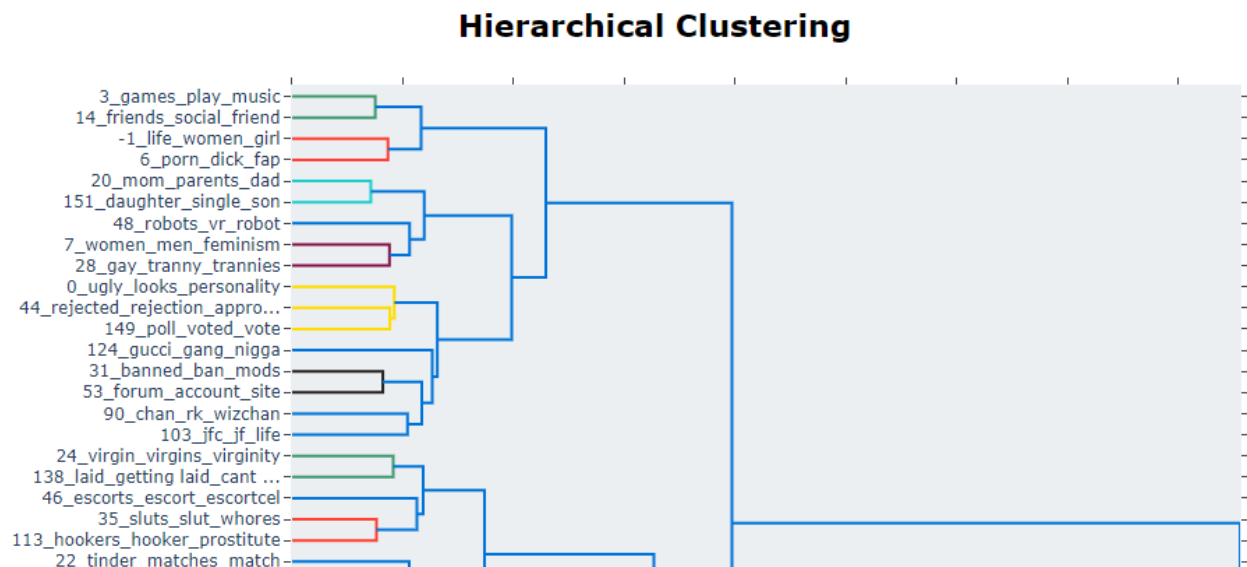


Figure 3: Sample Hierarchical Clustering of 500,000 posts

From these results, we saw a very wide variety of topics discussed by the Incels, with themes ranging from depression and loneliness to video games and anime. However, the topics discussed by the Incels can be separated into two main categories, those represented by the “Blackpill” theme and those represented by the “Looksmaxxing” theme.

Blackpill Theme

The “blackpill” refers to an ideology that states that all attractive features of a person are genetically predetermined, and women choose sexual or romantic partners solely based on physical characteristics.

The topics related to this theme tend to revolve around ideas of depression and loneliness, discussions of height, bone structure and other unchangeable physical characteristics, and topics related to violence and violent fantasies. The majority of topics under this theme concern discussion on the physical and mental characteristics that cause Incels to remain Incels. The main topics on physical features relate to height and facial structure, as these are some of the largest overall topics it reasons that they are the features Incels deem most important for attractiveness. There are many topics relating to mental health and mental illnesses, mainly autism, schizophrenia and depression. It’s clear from these topics and the documents contained in them that being an Incel is correlated with one or more of these conditions, which may explain the extreme difficulty with socializing many Incels experience.

A consistent theme throughout the blackpill documents is an intense hatred of women. This hatred seems to stem from the fact that women are blamed for having high standards and practicing “hypergamy”, a term that refers to finding romantic partners of a higher socio-economic background. However, when Incels use this term they replace the socio-economic background with physical attractiveness. While most of the topics contained under the “Blackpill” theme revolve around Incels complaining about their life and complaining about society, there are other topics discussing how incels “cope” with the hopelessness inherent in the “Blackpill” ideology. These “copes” include games, anime, drugs (mostly cannabis) and other similar endeavours. These “copes” represent some of the most positive topics under the “Blackpill” theme, as they are examples of Incels discussing what makes them happy and do seem to foster a sense of community. One major “cope” that is discussed frequently in the community and seems controversial is the act of buying sex. Terms like “escort” and “escort-cel” come up frequently, with some Incels clearly strongly disapproving of the practice and others describing it as a way to escape Inceldom. While these make up a minority of the topics and posts residing under the “Blackpill” theme, there are a substantial number of concerning topics that discuss violence and suicidal ideations.

Suicide

Suicide or “ropeing” as Incels refer to it, is a very common topic of discussion under the Blackpill theme. Since the essence of the Blackpill ideology is the hopelessness of life, suicidal ideation is an unsurprising result. Suicidal ideation seems to be more common than the act itself among Incels, as they are no topics related to methods or means of committing suicide.

Instead, Incels seem to prefer the idea of “ldaring” instead of actually going through with the act of killing themselves. “Ldar” stands for “lay down and rot”, and can be seen as the more passive way of approaching the blackpill ideology. “Ldaring” also shows up in topics relating to living a NEET lifestyle, with NEET referring to not being in education, employment or training. It’s clear from these topics that one-way Incels deal with the hopelessness inherent in the blackpill theme is by withdrawing from society as much as possible, i.e “NEETING”, and then continuing living with as little investment in life as possible.

Violence

Suicidal ideation is also closely related to violent fantasies, and many topics contain terms relating to suicide as well as terms relating to violence and references to mass murderers. Unlike “Ldaring” which describes a passive approach to both life and suicide, some Incels believe “Blackpill” ideology requires a very active approach and praise those who end their lives with a murder-suicide.

The term that Incels use for the act of murder-suicide is “Going er”, which references Elliot Rodgers, a mass murderer who killed six people and injured fourteen others in a series of attacks in 2014 in California. It is clear from the topics where his name is mentioned that Elliot Rodgers is an extremely influential figure in the Incel community. His name frequently appears in topics with words like “hero”, “saint” and “praise”. There are other mass murderers who are talked about in a similar manner, including Marc Lepine, Nikolas Cruz, Seung-Hi Cho, and Eric Harris. These Incel “heroes” cover a wide variety of mass murderers, from other misogynistic killers like Lepine to regular school shooters like Cruz and Harris. It is important to note though that killers with political ideologies like Timothy McVeigh or Dylan Roof are not idolized in the same way by the Incel community. Incels tend to identify with non-ideological killers and those that are generally depicted as loners. However, Elliot Rodgers is mentioned far more than the rest of the other mass shooters, with some in the community referring to him as the “patron saint of incels”.

The reason why Elliot Rodgers is worshipped to such a greater extent than the other mass murderers is made clear by another topic containing his name and the term “manifesto”. Before his mass shooting, Elliot Rodgers wrote a 400-page book chronicling his life and struggles as a way to justify the violent acts he was about to commit. This manifesto reads like an Incel bible, with Elliot Rodgers espousing ideas and themes that are reflected over and over again within the Incel discussion forums. The fact that Elliot Rodgers and his manifesto are mentioned so frequently among the topics derived from the Incel forums shows that many Incels strongly identify with him and his story, therefore it follows that his justifications for violence could be replicated among many others in the Incel community. Elliot Rodger’s justification can be best summarized by this quote:

“It would be a day in which I exact my ultimate retribution and revenge on all of the hedonistic scum who enjoyed lives of pleasure that they don’t deserve. If I can’t have it, I will destroy it. I will destroy all women because I can never have them. I will make them all suffer for rejecting me”.

This theme of jealousy and hating others for having things one can’t obtain shows up often among the topics discussed by Incels and seems to be the main reason why they turn to violence. Many Incels believe they have gone through a great deal of suffering throughout their lives, and want to “ascend” Inceldom by causing others to experience similar suffering. Ascending is highly encouraged within the Incel community, although it is hard to tell by looking at the topics how serious Incels are when discussing this prospect. It’s clear that Incels praise the idea of ascension and fantasize about it, but it is difficult to predict when these fantasies could turn into violence in the real world. There are topics revolving around terms like “Gun”, and “Shoot” that also contain terms like “Buy”. There are also topics containing the term “commit” and the term “er”, together these topics provide some evidence that the violent fantasies discussed by the Incels are grounded in reality. However further research will be needed to determine if Incels whose posts end up in these topics are more likely to commit violent attacks than those whose posts don’t.

Looksmaxxing Theme

“Looksmaxxing” is a term used by Incels which means doing everything in one’s power to increase their sexual attractiveness. Topics under this theme revolve around the idea that self-improvement is possible and worth working towards, which is contradictory to the “Blackpill” ideology that your attractiveness is determined from birth and there is nothing you can do to change it. One topic revolves around plastic surgery, specifically facial surgery, with the idea being that changing one’s facial structure can radically change one’s attractiveness. Another topic revolves around improving one’s fitness by going to the gym and another revolves around lowering social inhibitions to make socializing easier.

Another common topic in the looksmaxxing theme is moving countries, usually those in the western world moving to countries in the east. This is seen in topics associating the terms “Thailand” and “Philippines”, with “Visa”, “Trip” and “Matches” (referring to tinder matches). Incels seem to believe that they will have better odds of finding a romantic partner in these countries than in their home countries in the west. There are also many posts from Incels congratulating other Incels for managing to find romantic success and leave the community, showing that there is still a good degree of support for self-improvement. Overall the topics and posts that fall under the “Looksmaxxing” theme are far less concerning than those associated with the “Blackpill” theme. Unfortunately, based on the topic sizes, it seems that posts relating to the “Blackpill” theme make up the majority of the discussions on the Incel forums. While topics

under the “Looksmaxxing” theme may seem less important, they could give insight into which interventions are most likely to get Incels to leave the community.

Racism and White Supremacy

One of the main goals of this project was to discover whether or not white supremacist ideals had penetrated the Incel community, and if there was a potential for Incels to become something like useful idiots for white supremacists.

Looking through the topics generated by the Incel discussion forums provides plenty of evidence of racist and anti-Semitic tropes and ideas. Phrases like “Goyim” and “Oy Vey” show up frequently, and there is an entire topic populated with different variations of the n-word. There are also topics where terms like “Somali” and “Black” show up with “Thug” and “Subhuman”. Terms like “Ethnic”, “Race” and “White” also show up in a number of different topics, as do terms like “kek”. However, delving further into the topics shows that Incels and white supremacists aren’t as similar as they would first appear. None of the topics show references to common white supremacist talking points such as white power, great replacement theory, or creating an ethnostate.

Instead, Incels consider race to be just another unchangeable physical attribute like height or wrist size. While there is evidence that Incels consider white to be the “best” race, there is no evidence of hatred towards other races. In fact, there seems to be a sizable portion of the Incel community that’s non-white, with terms like “curry-cell” and “rice-cell” showing up frequently to describe South Asian and East Asian Incels respectively. Incels also seem to be quite supportive of Muslims and sharia law, particularly concerning the rights of women, which is a very different perspective than mainstream white supremacists. White supremacists and Incels are most similar when discussing the state of western society, with topics containing the term “society” also containing terms like “degenerate”. This is very similar to the terms used by white supremacists, and the people Incels blame for the state of society are mainly feminists and Jews, which also overlaps with the beliefs of white supremacists.

However, the outcomes the two groups want to achieve couldn’t be more different. White supremacists have a clear political goal in mind, which is typically creating a society inhabited solely by white people. Incels on the other hand have no clear political goals, except for wanting people to suffer to the same extent that they believe they have suffered. This difference would make it unlikely that Incels could become useful idiots for white supremacists, however, there is still clearly a lot of overlap between Incels and white supremacists on race, Jews and the role of women in society.

Conclusion and Future Work

In conclusion, the goal of the project was achieved, with multiple themes and many topics of discussion being identified from the Incel forum post data using NLP. Topic modelling helped show that Incels differ significantly from other violent radical groups like white supremacists and jihadists due to the fact that they have no discernable political goals. Incel attacks are less like terrorism and more like school shootings, where hatred and rage are the main motivations, and forcing other people to suffer is the only real goal.

This could make deradicalizing Incels more difficult, as well as predicting future attacks. Future work on this subject could include using more complex algorithms to determine the sincerity of the topics and ideas discussed by the Incels. Since Incels now know that others, including law enforcement, are reading what they write they could be obfuscating their true intentions with their posts. This makes it difficult to believe if Incels actually believe what they are writing, and therefore makes it difficult to predict which members of the Incel community are likely to commit violent attacks in the future. It would also be interesting if Incels who commit attacks could be matched with their respective username on the forums, and the topics their posts belong to could be compared with the posts of Incels generally. This could help identify which topics are most closely associated with real-world violence, and hopefully help predict which users are the most dangerous. Since Incels seem to idolize school shooters it would also be interesting to research the online activity of those who commit school shootings to see how many of them are involved in the Incel community. Doing the same process for Incels that have left the community could help further identify the least harmful topics, and possibly identify potential positive interventions.

Regarding the use of BERTopic, future work could involve running the analysis for more parameter variations, possibly experimenting with different UMAP models and sentence transformers. This could improve the quality of the topics and possibly discover new ones, which could lead to more insights about the Incel community.

Overall while topic modelling provided good insights into what Incels discuss and shed more light on their ideology, more research will be needed to do a proper threat assessment of the group and to determine what the best policy would be to prevent further attacks.