

Lost in Translation: The Impact of Google Translate's Inaccuracy and Misinformation

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Abstract

Our study is aiming to investigate the limitations and the potential harms of utilizing Google Translate, which is a highly used platform for translation. This research also aims to explore ways to improve accuracy and cultural accessibility within the platform. The literature review highlights incidents of mistranslation and algorithmic bias, and the importance of diverse data and human translation. We look to conduct interviews for ethnic communities and ask them of their experiences with Google Translate and other translation services. We hope that this study will address the need for a more culturally accessible world.

Introduction

The author was initially impressed by the accessibility of Google Translate in over 130 languages (Fatmi, 2022). However, it wasn't until the passing of his brother that he became aware of the inaccuracies of the platform. His family had moved to the US from Korea, and while the writer had the advantage of pursuing an education in America, his older brother lacked English proficiency but still attempted to expand his bakery business. The brother had difficulty using Google Translate due to the lack of nuances in the Korean language, which caused added stress and ultimately led to his illness. In addition, the inaccuracies of website translations resulted in misdiagnosis and inadequate medical care, ultimately contributing to his passing.

Through this experience, the author recognized that cultural context is essential for accurate translations and that databases alone cannot fully replicate it. He came to understand that human interaction is the most authentic source of cultural information. This realization motivated him to envision a more culturally accessible world and push the boundaries of technology. However, the question remained: how can cultural context be incorporated into databases? To gain insight into people's personal frustrations with Google Translate, the authors will conduct an extensive survey and interview, as well as supplement that with further online research.

Literature Review

Recently, the Virginia Department of Health faced criticism for using three marketing agencies and Google Translate as their primary sources for translating COVID-19 and vaccine-related information for Spanish speakers. (Bell, 2022). A translation error led to Spanish speakers being told they did not need coronavirus vaccines, which could potentially put their health and safety at risk. In this case, Google Translate translated "the vaccine is not required" as "the vaccine is not necessary," leading to confusion and misinformation.

This specific incident points out the potential consequences of relying solely on technology for translation, especially when dealing with sensitive and critical information like vaccinations in a pandemic. This is particularly concerning for minority communities like the Hispanic population in Virginia, which has been disproportionately affected by the coronavirus. Advocates and certified translators have criticized the state's lack of investment in adequate translation, arguing that this shows a lack of concern for communities that already face barriers to accessing healthcare due to language and trust gaps.

The incident emphasizes the importance of using qualified translators and interpreters who are trained to handle complex and sensitive information, especially in the healthcare field. While technology can be a useful tool for translation, it should not be relied upon as the sole means of communication for critical information that can impact people's health and well-being.

One of the services Google Translate offers is a public community forum for users to post questions and concerns so other users and Google employees can respond and discuss issues on the platform. Upon browsing the forum for user responses related to misinformation, one post caused reason for concern. Google Translate user “_미쿠오” posted this to the Google Translate community forum on April 20th, 2020. “This is for Google Translate from English to Korean, Pancreas is 췌장 or 이자 NOT 신장 or 콩팥신장 and 콩팥 is Kidney. This is catastrophically wrong, and a severe disappointment, and may lead to misinformation. ESPECIALLY CONSIDERING IT IS COMMUNITY VERIFIED. It isn't even easily changeable because it is community verified. Really guys? Really? It is community Verified? Really?” (_미쿠오, 2020) This is a prime example of how an incorrect translation can directly affect a user, but luckily this user was able to spot the mistake. However, it is important to bring up the point that the wrong translation was community verified. How can a translation that was incorrect go on to be community verified? This shows a gap within Google's database and how an incorrect translation can be pushed out to users even with multiple steps in place to supposedly fact-check and prevent this from happening. Not only did Google get the original translation wrong, but the community verification system also falsely verified this.

Since Google Translate serves as the main translation service for millions of people worldwide, this can create a trickle down effect for other databases if they model their system after Google's. Any minor errors that may be underlying in Google's algorithm or database could transfer over to other translation services if their model imitates Google's. Google essentially holds a monopoly over the language translation world. “As the main entry point into the online data universe, Google is a key player in organizing and structuring knowledge. Positioned at the switchboard of the global flow of information, it plays a major role in the entangled relations between global and local orientations. Any examination of Google Translate should therefore engage critically with how the function of translation fits within Google's ideology of information flow and global connectivity.” (Ramati & Pinchevski, 2018). Since Google is a business, they could potentially push their own agenda, whether it be intentionally or unintentionally. This language barrier creates a gray area because Google Translate utilizes a machine generated response. Interaction between one machine and another machine

differentiates from interaction between human and machine. This gap potentially creates error since the human verification factor is eliminated. “Translate conversely encourages lingual multiplicity in conjunction with universal connectivity, and this is precisely because it is operating in terms of the statistical correlations within and between natural languages rather than following the rules of natural languages. With the introduction of interlingua, a new configuration of human–machine and machine–machine communication begins to appear, one that is based on a common infrastructure and a single interface. Through Translate, Google has redefined what machine translation means in the digital age, which is also the age of Google’s dominancy.” (Ramati & Pinchevski, 2018) Google’s global dominance in the translation realm will continue to grow with no other challenger present. Because of this, it is key that Google maintains an accurate database and improves their verification system to ensure all translations given to users are correct and can not cause harm or misinformation.

The idea that technology will soon replace human translators is pervasive, but the reality is more complicated. While consumer-level translation technology has improved, it is often insufficient for sophisticated health, legal, and business dealings. (Ordorica, 2020) Literal translation can fail to convey the correct meaning, and machines struggle with scans, handwriting, and acronyms. Additionally, language is more complex than just word replacement, and machines cannot imitate emotional context or the unique patterns of speech that therapists, speechwriters, and salespeople have spent years perfecting. To thrive in the translation industry, agencies should diversify their offerings and focus on growing but underserved markets, such as emerging markets like Indonesia, and offer specialized services for specific immigrant groups. Agencies can also move into medical and legal services by first focusing on niche needs. Clear communication is the key to cultural inclusion, creating the ideology that Google Translate should not be praised by foreigners.

The accuracy of Google Translate is affected by a variety of factors, including the complexity and context of the text being translated, the language pair being translated, and the quality of the underlying machine learning models used by the tool. Looking into the accuracy of Google Translate it has many factors that lead to the use of misinformation. One of the main challenges for any machine translation system is these databases aren't actually digesting the words put into the website. For example, with Google Translate, a translation system used by over 500 million people each day has a hard time giving accurate results with difficult languages. (McFelder, 2021) The complex grammar structures, idiomatic expressions, and cultural references that have more meaning behind the word. With languages that are more difficult to translate, translating between English and Chinese can cause major inaccuracies because the syntactic and semantic structures of the languages are very different. Finally, the quality of the machine learning models used by Google Translate can also impact its accuracy. While Google Translate uses some of the most advanced machine learning techniques available today, no machine translation system is perfect, and errors can occur when the models make incorrect assumptions or lack the necessary training data. Despite these limitations, Google Translate can still be a very useful tool for getting a rough idea of the meaning of text in another language.

However, foreigners should not just rely on a machine for daily translation that could result in something serious in their lives.

According to a study from the Georgia Institute of Technology, self-driving cars may be more likely to hit people of color than white people. The study found that automated vehicles can more accurately detect pedestrians with lighter skin tones, which could lead to harm for those with darker skin. The researchers analyzed object-detection models and found that the models were less accurate in detecting people with darker skin tones. This algorithmic bias reflects the problem of human bias seeping into automated decision-making systems. (Samuel, 2019). A lack of diversity among the teams developing these technologies contributes to this bias.

This is another prime example of how previous biased data being integrated into technology causes issues, especially for people of color. We are transitioning from times where people were much more divided in terms of the color of their skin or even their religion. As the world attempts to bring people together and diversify technology, problems still arise as our data is lacking when it comes to people of color. If you look up a picture of a person or a human on Google Images, there will be much more white people shown compared to people of color. The lack of diverse data being used for our technology is causing misinformation and directly affecting minority groups and people of color. Possible solutions include mandating that companies test their algorithms for bias and ensuring that teams developing new technologies are diverse.

Research Question

How can we bring awareness to and prevent misinformation within ethical and cultural communities in computer machine algorithms and databases?

This is important because there are gaps in existing literature. There is little research on the specific challenges faced by ethical and cultural communities in relation to misinformation in computer machine algorithms and databases. While there is a significant body of research on the broader topic of misinformation, there is a lack of attention paid to the unique challenges faced by specific cultural and ethical communities in this technical regard. ■

The thought Process behind coming up with our question also takes influence from our Literature review. For example, Google Translate users posting their frustrations to the community forum caused us concern, which made us want to research this question further. In addition, there is limited research on the potential long-term effects of misinformation within ethical and cultural communities in computer machine algorithms and databases. There is a need for more research on the potential social, economic, and political consequences of misinformation within these communities, and how this can impact their overall well-being and quality of life.

Research Design and Implications

Before implementing ethical solutions into Google Translate databases, there first must be a proven correlation between misinformation and google's translation software since different perspectives of people use this program for cultural understanding. There is deception within the spectrum of Google Translate towards the ethnic community. Google doesn't recognize the social context of various ethnic cultures due to different dialects and word formats that causes delusion within an individual's comprehension. Blatantly thinking google's translation is 100% correct, will lead to bias and a form of miscommunication that causes misunderstandings in peoples which lead to harmful situations.

The research design will emphasize both combinations of qualitative and quantitative research methods. This mixture of methods will help analyze the target scopes responses and have a bigger area to collect data from to pursue answering the hypothesis needs. Measures of qualitative research will be used to seek out people's responses of translated words to their respective cultures' understanding that will help seekout errors/success with translation processing. Quantitative research methods will also be integrated based on questions formatted for the sample population to respond in which gathers numerical data.

The first methodology will be the use of interviews and survey questionnaires to gain deep insight with different individuals who had used Google Translate before. This interview process will mostly be a qualitative research step with a small aspect of quantitative questions to ask individuals and work with them throughout their responses to offer adaptable questions that suffice to their experiences. Questions will be asked that pertain to each individual's usage of Google Translate and how there's mishaps of misinformation.

In the interview process individuals will be seated with an interviewer one-by-one and will be asked a series of questions. Each question will be asked one at a time where the individuals are given a good amount of time to respond to each question in an in-depth answer. Their responses will be recorded via video recording to gain both word and behavioral responses. The questions are either answered by short responses or yes/no phrases while letting the individuals choose to let themselves opt out of making an answer if they deem the question uncomfortable.

The questions will be asked in a respectful manner to offer a sense of dignity for the interviewees to answer and thus have data about their personal experiences from their usage of translation services. Information from each individual will be analyzed by their type of behavior from the questions asked while also taking note of their communicative replies that will give open-ended context and results to work with. This method also offers features of quantitative data as questions delivered such as "Have you ever been given a translation that you deemed was incorrect? (Yes or No)" will be aggregated. Numerical data will be less permissive towards biased answers that would've been attained from qualitative questions we ask such as "Can you recall a time when Google Translate gave you an incorrect translation?". Both types of questions are necessary to empathize what hardships each participant would go through and make solutions from their problems.

The second method used by researchers will be online research. This is a qualitative tool to use as they roam the domain of the internet to attain various peoples' criticisms when using translation services. Researchers will begin searching the web using proper key terms that intertwine misinformation and Google Translate. Various relevant key terms will be offered such as "Google Translate errors" inside browser search engines and use the most prevalent results. Results such as academic databases from online research will also be used due to their peer reviewed content to use more reliable information. Through online research, several websites will help seek out results. An asset will be chat GPT. This is an AI system that allows user input to search out results through its unsupervised machine learning, and offers data that tracks personnel errors with Google translation system. Key terms or basic questions will be inputted into its search engine such as "Google Translate errors" which outputs necessary outcomes that align with the concept of misinformation within google's translation discipline.

This is a great way of collecting data since people's encounters with Google Translate errors are discovered. The internet offers places that house groups/websites deliberately for issues they have with translation. A key component that the researchers will dive into is the webpage of google's translation forum that places itself as an area for real-life people to talk about issues they personally had. Examples previously mentioned in the literature review displays the method of online research being a contributor to qualitative research by exhibiting a high volume of incidences of poorly performed translations where users embark on stressful mannerism that affect their quality of life.

Discussion / Expected Outcomes

After doing the research, the participants might see that there is misinformed understanding when ethnic races use Google Translate. This should help to bring awareness within translation services misrepresentation thus conforming to more ethical implementations into Google's database to transform a better output for people's understanding. The research will show the impact Google Translate has on cultural communities. This research will bring to light for the audience that there is a correlation between misinformation and Google Translate's misinforming words that corresponds to different races' understanding. Translation machines are a worldwide problem and the emphasis of Google with their flaws will justify how the translation system will fail in ethnic communities' daily lives.

Appendix (Survey)

Survey Objective: Online survey questionnaire sent out to ethnic communities and those who speak multiple languages to obtain quantitative results. Once we obtain the results we plan on creating visualizations to see our results on graphs. We also plan to do more online research with things like Chat GPT AI to analyze our results and expand upon them. This survey is more generalized than the interview and the goal is to gauge our user's understanding and experience with the research topic.

Survey Introduction: “Thank you for opting in to participate in our survey, by answering these questions it confirms that you have given consent for the data gathered from this survey to be used for research purposes only, and your responses will remain anonymous and confidential. For this survey we want to evaluate the impact of translation services like Google Translate and the effect they have on their users. We are very appreciative of your participation, and please take as much time as you need to fill out the survey.” 📌

Survey Questions: (Quantitative results)

- 1) Do you trust that Google Translate is 100% accurate? (Yes or No)
- 2) How often do you use Google Translate? (Number/per day)
- 3) How many languages are you fluent in? (Number)
- 4) Do you use any other translation services besides Google? (Yes or No)
- 5) Have you ever been given a translation that you deemed was incorrect? (Yes or No)
 - a) Did this impact you in a negative way or cause harm? (Yes or No)
- 6) Would you be able to go on with your daily life without Google Translate? (Yes or No)
- 7) Do you think Google Translate accidentally causes misinformation? (Yes or No)
- 8) Do you believe the Google Translate algorithm / database is respectful and inclusive of all languages and cultures? (Yes or No)

Survey Conclusion Statement: “Thank you for taking the time to complete this survey. Your results mean a lot to us and we hope to learn from them. Our research wouldn’t be possible without your participation. The survey has concluded.”

Appendix (Interview)

Interview Objective: Obtain qualitative results and get insight into personal user experiences with Google Translate. This is deeper than quantitative results because the goal is to gauge individual opinions and how they were directly affected. The interview participants that will be targeted are those who identify with ethnic and cultural communities, or those who speak multiple languages fluently.

Interview Script: “Hello, thank you for choosing to participate in our research study. We are going to ask you some questions about your personal experience with Google Translate. Please take as much time as you need to give your answer, and go into as little or as much depth and detail as you are comfortable with. If you are uncomfortable with any questions, please let me know and we can move on to the next, the goal is to get insight into your personal experience. We will be recording this interview so we can analyze the responses later with the team. If you have any questions, please feel free to let me know, otherwise let us begin!”

Interview Questions: (Qualitative Personal Results)

- 1) In what setting is your main purpose for using Google Translate? (open-ended)

- 2) Can you recall a time when Google Translate gave you an incorrect translation?
 - a) (If yes) → How did this affect you? Were there negative consequences because of it? (open-ended)
 - b) Would you consider this misinformation to be Google's responsibility? (open-ended)
- 3) If you could change anything about the current Google Translate algorithm / database what would it be? (open-ended)
- 4) Do you trust Google's community verification and fact-checking process? (open-ended)
- 5) Are you aware of Google Translate's community forum and do you use it? (open-ended)
 - a) (If yes) → Are you satisfied with it? What are your thoughts on it? What could be changed? (open-ended)
- 6) Do you think Google Translate will ever be perfect? Why or why not? What do you think Google Translate will look like 10 years from now? (open-ended)
 - a) If Google Translate cannot be perfect, do you think it will continue to misinform users? What are your thoughts on this? (open-ended)
- 7) If Google Translate cannot come up with a valid translation, how do you think they should handle this? Instead of giving a wrong translation, what would be a better way to handle this? (open-ended)
 - a) *Important to collect user's preferred solution and expand upon it
- 8) Do you have any recommendations or improvements for Google Translate? (open-ended)

Interview Conclusion Statement: "Thank you for taking the time to complete this interview. We hope to learn a lot about user experience and Google Translate with the data we gathered today. We plan on holding on to the data for as long of a period of time as it takes to create visualizations and analyze them. Your answers will remain anonymous and confidential, and we will keep you updated with our research as it progresses. If at any time you have any further questions or concerns do not hesitate to reach out to us, as our research wouldn't be possible without your kind participation. Thank You!"

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Discussion / Expected Outcomes	Carlos, Tom
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