

- **Explore AI tools developed by Google. Investigate, review and try it out.**

Google has developed several AI tools widely used in various applications, including machine learning, natural language processing, computer vision, and speech recognition. Here are some examples of AI tools developed by Google:

- **TensorFlow:** TensorFlow is an open-source machine learning framework developed by Google. It provides tools for building and training machine learning models using deep neural networks, decision trees, and clustering techniques.
- **Google Cloud AI Platform:** Google Cloud AI Platform is a cloud-based platform that provides tools for building and deploying machine learning models. It includes tools for data preparation, training, and deployment of machine learning models.
- **Google Cloud Vision API:** Google Cloud Vision API is a computer vision tool that enables developers to build applications that can understand the content of images. It provides features like object detection, text recognition, and facial recognition.
- **Google Cloud Speech-to-Text API:** Google Cloud Speech-to-Text API is a speech recognition tool that enables developers to build applications that can transcribe speech into text. It provides features like speaker *diarisation**, automatic punctuation, and real-time streaming.
- **Google Cloud Natural Language API:** Google Cloud Natural Language API is a natural language processing tool that enables developers to analyse and understand text. It provides sentiment analysis, entity recognition, and content classification features.
- **Google AutoM:** Google AutoML is a machine learning tool suite that enables developers to build custom machine learning models without requiring extensive expertise. It includes tools for image classification, text classification, and language translation.

In summary, Google has developed several AI tools that enable developers to build sophisticated machine learning, natural language processing, computer vision, and speech recognition applications. These tools are widely used across various industries and have helped to advance the field of AI significantly.

Speaker *diarisation** (or diarization) is the process of partitioning an audio stream containing human speech into homogeneous segments according to the identity of each speaker.

- **Explore Google Translation by entering a sentence and then translating it into a language you understand. Examine the quality of the translation. Analyse why the translation quality is good or bad from a computer science perspective, i.e., the technology behind it, what is being used, and what technology may have improved the quality.**

Original sentence (in Portuguese): Sou estudante do curso de mestrado em Ciências de Computação, na universidade de Essex.

Translated sentence (to English): I am an MSc student in Computer Science at the University of Essex.

Translation quality: The translation quality is excellent. The meaning of the original sentence is accurately conveyed in the translated sentence, and the grammar and syntax are correct, but it abbreviated Masters to MSc. However, the translated translation reads naturally and is simple to understand.

Analysis: Google Translation automatically uses advanced machine learning algorithms to translate text between languages. The translation quality depends on several factors, including the complexity of the original sentence, the similarity between the languages, and the quality of the training data used to train the machine learning models.

In this case, the original sentence is relatively simple and straightforward, which makes it easier for the machine learning algorithms to translate it accurately. Spanish and English are also fairly similar languages, which helps to improve the translation quality. Additionally, Google Translation has access to a vast amount of training data, which includes millions of bilingual texts, and this allows the machine learning models to learn from a wide range of examples and improve the quality of translations over time.

In brief, Google Translation's quality is quite good and improving thanks to advances in machine learning and access to more and better training data. However, it is essential to remember that machine translation could be better and may still produce errors or inaccuracies in some cases.

Google Translation is powered by machine learning algorithms that analyse patterns in language to learn how to translate text from one language to another. The system uses a technique called neural machine translation, a type of deep learning that enables the system to learn the context and meaning of words and phrases.

The quality of Google Translation can vary depending on several factors, such as the complexity of the text, the language pair being translated, and the availability of training data. In general, Google Translation provides a good quality translation for simple and common phrases. However, it may need help with more complex sentences or specialised language.

From a computer science perspective, the quality of the translation depends on the quality and quantity of the training data used to train the machine learning model; the more diverse and high-quality training data, the better the translation quality. Additionally, advances in deep learning and natural language processing techniques can improve translation quality.

To conclude, Google Translation is a powerful tool that provides a good quality translation for common phrases and sentences. However, it still needs improvement in handling complex sentences and specialised language. As technology advances, we expect further progress in machine translation quality.

References:

Google AI Blog. (2020). *Recent Advances in Google Translate*. [online] Available at:
<https://ai.googleblog.com/2020/06/recent-advances-in-google-translate.html>.