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Design and Integration of an Intelligent Agent to a Telemedicine Platform, for the Translation of Exchanges Between Doctor and Patient During Teleconsultation: Methodology of Design and Technological Choices

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Abstract. After having designed and implemented a telemedicine solution equipped with a video presence tool for teleconsultation and tele-expertise and in order to obtain a faithful communication between healthcare professional and patient despite language differences, our study was to perform a literary review on the various existing works and to perform analysis on the different types of neural network for designing an voice intelligent agent for translation during exchanges between doctor and patient during teleconsultation and make tool choices for its development.

Keywords. Artificial Intelligence, Telemedicine, Voice Translator, Intelligent Agent, Teleconsultation, African National Language

1. Introduction

The introduction of new technologies has significantly changed medical practice. In addition to the know medical desert in Burkina Faso, there are also a multitude of spoken languages [1], a barrier for faithful communication between doctor and patient. Our job is to design an intelligent agent for the translation of exchange during a teleconsultation. The objective of this article is to define a design methodology and choose the appropriate technologies for its implementation. To do this, we carried out a state of the art on the different existing works and study on the different types of neural network for the design of our agent.

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2. Methods and Results

In order to achieve our objective, our work consisted in a review of similar works and study on the different types of neural networks used for voice translation.

As a result, we defined as methodology for the design: the establishment of a medical dictionary [2] French-Dioula, development [3], testing, evaluation and documentation of the intelligent agent. So we have defined a process illustrated below:

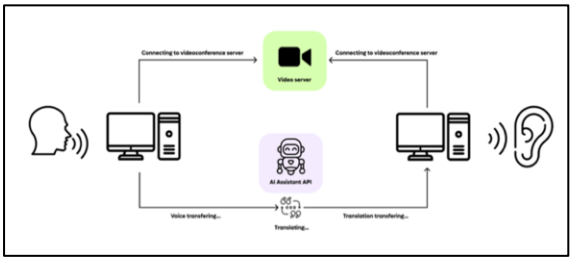

Figure 1. Interconnection between the three parts of the solution during a translation.

In this figure, we have on the left, a user speaking language A transmits his message to the intelligent agent who translates the message into language B which is transmitted to the user on the right.

For the development tools, we chose Transformers, as a neural network and the PyTorch library for development.

3. Discussion and Conclusions

To achieve our goal, we focused on the translation of French-Dioula. Inspired by the methodologies of speech translation tool design and our context, we have implemented a dictionary construction method involved health stakeholders and local linguists. For our technological choices, after a comparative analysis of the neural networks of the NLP approach, we chose the Transformers and the PyTorch library [3] for its simplicity in artificial design.

In this short, this study allowed us to define a methodology for the design of our intelligent agent in local language and to make the technological choices for its implementation. This agent will allow an easier transition to the language level in Burkina Faso. This agent will help Burkina Faso in its language transition.

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