Universal voice translation model for hospitals and health centres in the event of pandemics and epidemics: Studies and voice translation of Africans languages

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ABTRACT

Around the world, billions of people are affected by pandemic or epidemic diseases.

A universal voice translation model for hospitals and health centres can help to improve communication between healthcare staff and patients and reduce the mortality rate from pandemics and epidemics.

In general, the official or United Nations languages are the languages most spoken in hospitals and health centres by doctors and health staff.

In Africa, most people only know their mother tongues when pandemics or epidemics strike, so there are language barriers between health workers, doctors and the local population.

In certain areas of the world where pandemics and epidemics are more prevalent, most people only understand their mother tongue or national language.

These language barriers make it difficult to reduce mortality rates and combat pandemics and epidemics.

A universal voice translation system for hospitals and health centres is a necessity for the population, doctors and health staff. We are going to build on the research of our previous model entitled: "Model for the voice translation of African languages of medicine leaflets for the fight against pandemic and epidemic diseases" to put in place, in the event of new pandemics or epidemics, a model entitled: "Universal voice translation model for hospitals and health centres in the event of pandemics and epidemics" which will be composed of official languages of the United Nations, African languages and Senegalese mother tongues or national languages.

Firstly, for the case study, we will draw up a list of official languages, African languages and Senegalese mother tongues or national languages.

Secondly, we will propose a model applicable to given African languages.

The aim is to set up a universal speech translation model based on AI for the speech translation of official, African, native or national languages.

In this paper, we will study the general context, the research problem and the objectives.

Finally, we will move on to the study of the methodology, the presentation of the research results, conclusion and perspectives.

CONTEXT

1.The impact of voice translation systems on pandemics and epidemics

With the evolution of pandemics and epidemics such as Covid 19[2], voice translation systems are playing an important role in communication between doctors and patients.

The universal voice translation system can be used to inform the public and patients in the event of a pandemic emergency, and to inform hospitals and health centres of preventive measures to be taken against pandemics and epidemics.

During the pandemic or epidemic crisis (Covid-19).[5] , organizations required multilingual communication across all language barriers, and specialist translators provided rapid medical translations.

In Africa, mother tongues and national languages are not represented in voice translation software or in the global linguistic AI market.

To combat the spread of pandemics and epidemics, the use of voice translation systems incorporating national, mother tongue or national languages can help raise awareness in villages and the most remote areas, and slow the spread of pandemics and epidemics.

A. Growth chart for pandemics and epidemics:

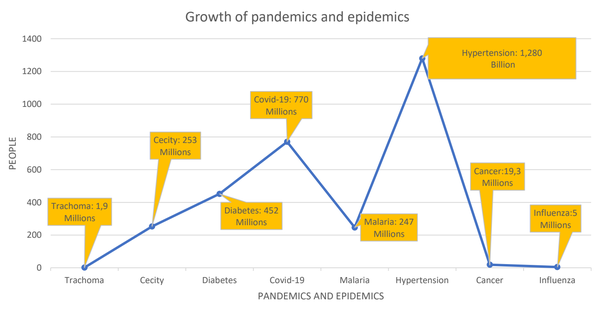


Figure 1: Growth of pandemics and epidemics

CONTEXT(Following)

2.Voice translation Systems

The voice translation system performs voice translation[4] , enabling multilingual translation from voice to voice and from voice to text.

There are three modules for speech translation systems[8] : a first module "speech recognition "convert speech to text, a second module "machine translation" allows the translation of millions of words with the original language text to another target language text ,and a third module "speech synthesis "convert text to speech.

Neural machine translation is close to human, used by "machine learning".[3]

Artificial neural networks used by "Deep Learning" have led to more efficient voice translation systems. [6]

Figure 2: Speech recognition

Figure 3: Speech synthesis

3.Integrating African languages into voice translation systems

There are over 7000 languages spoken in the world, and at least 4000 with a writing system.

In Africa, we have some 2,000 spoken languages, which are virtually non-existent for AI systems.[1]

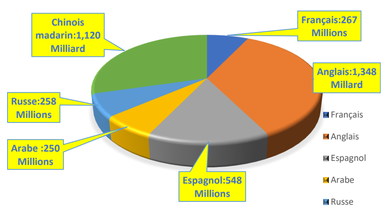


Figure 4: Officials Languages

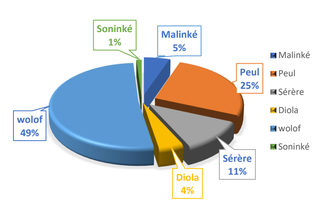


Figure5 : Senegalese nationals Languages

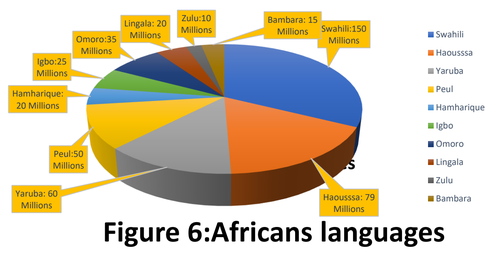


Figure 6:Africans languages

THE RESEARCH PROBLEMS

- Lack of voice translation technologies for African languages, mother tongues or national languages in hospitals and health centres.
- Difficulties for patients and the general public in accessing information or preventive measures in the event of pandemics or epidemics.
- Problems of language barriers between doctors, healthcare staff, patients and populations in the event of pandemics and epidemics.
- Lack of intelligent systems or conversational voice translation agents to guide patients, issue alerts or inform patients of emergency measures to prevent pandemics and epidemics.

OBJECTIVES

- Contribute to reducing mortality rates from pandemics and epidemics.
- Enable the voice translation of official languages into African, mother tongue or national languages.
- Set up a speech recognition programme for official languages in African languages.
- Carry out voice translation of African languages

METHODOLOGY

- Study of a sample of a corpus in the event of pandemics or epidemics **"Hello to avoid Covid 19 keep your distance, respect the barrier gestures thank you for your attention".**
- Pycharm, Python language
- Google Translate, automatic translation
- Speech recognition, machine learning, deep learning
- Speech synthesis, Natural Language Processing

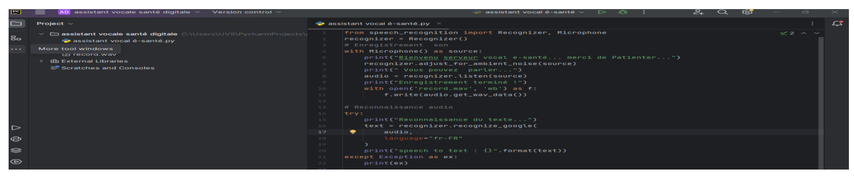
PRESENTATION OF THE RESEARCH RESULTS

1.Voice translation of the following African languages: Swahili, Amharic, Bambara, Igbo, Lingala, Yaruba, Zulu, Hausa, Omoro

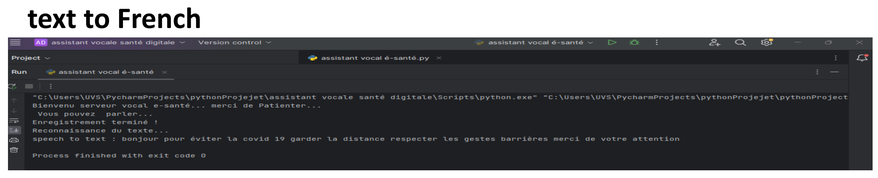
❑ Swahili language Voice translation

Swahili is the most widely spoken language in Africa. The doctor will send the following audio message to the patient: **"Hello to avoid Covid 19, keep your distance, respect the barrier gestures, thank you for your attention". [7,9]**

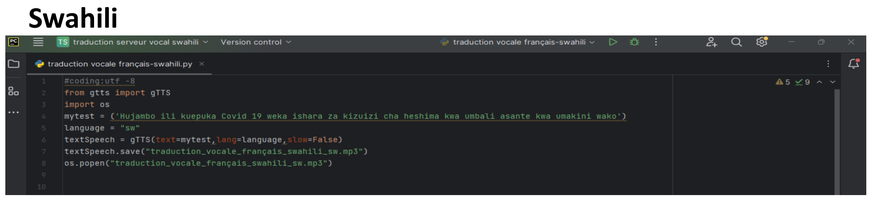
- **Setting up the voice recognition programme to convert speech into**



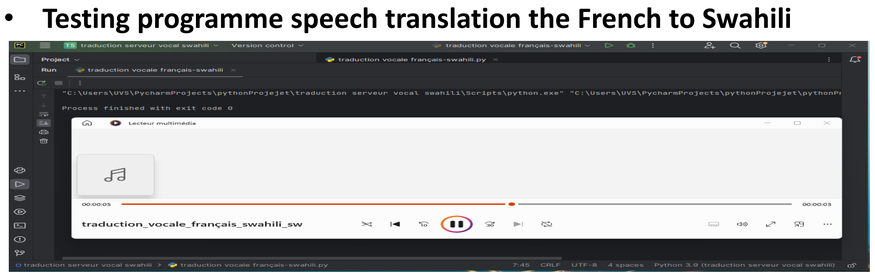
- **Testing the speech recognition programme to convert speech into text to French**



- **Programme for voice translation Text to speech from French into Swahili**



- **Testing programme speech translation the French to Swahili**



2.Discussion of the research results :

We can combat the development of pandemics and epidemics.

In remote regions and areas, people only know their mother tongues and national languages.

The integration of universal voice translation technology systems can help to reduce mortality rates and combat pandemic and epidemic diseases.

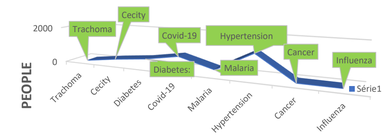


Figure 7: Reduction pandemics and epidemics

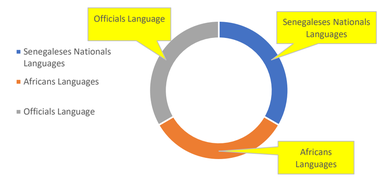


Figure 8 : Universal Voice translation model

Conclusion and perspectives

The universal voice translation system for hospitals and health centres is a necessity for doctors, health staff and patients.

As the majority of the population use their mother tongues, the voice translation system can help to reduce the mortality rate from pandemics and epidemics.

African languages, and Senegalese mother tongues and national languages in particular, do not have the database required for automatic translation systems and voice translation software.

In the event of pandemics and epidemics such as Covid 19, the universal voice translation system can be used in rural areas to combat pandemic and epidemic diseases.

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