Mid-Term Review
15 February 2019, Lisbon

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ESR10, WP2

Contract start date: 15 September, 2018

Host Institute: Antwerp University Hospital, Belgium

Supervisor(s): Prof. Dr. Marc De Bodt &
Prof. Dr. Gwen Van Nuffelen

PhD student at University of Antwerp

Secondary supervision

IDIAP

TBox

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Marie Sklodowska-Curie grant agreement No 766287.

ESR10, WP2 - Background

Profession: Biomedical Engineer, Universidad Central "Marta Abreu" de Las Villas, Santa Clara, Cuba

Research Topic: Implementation and Application of Morphological Granulometric Functions for Microscopy Cell Image Classification.

Background:

- Digital Image and Signals Processing
- Speech Processing
- Programming in Matlab
- Data Analysis
- Pattern Recognition

Work Experience:

Jose Marti University, Sancti Spiritus and Central University Marta Abreu de Las Villas, Cuba
Center for Clinical Engineering and Electromedicine, Cuba
Dept. of ORL, Head & Neck Surgery and Communicative Disorders, UZA, Belgium

Role in the Project & Objectives

Development and Validation of a Virtual Articulation Therapist (VAT)

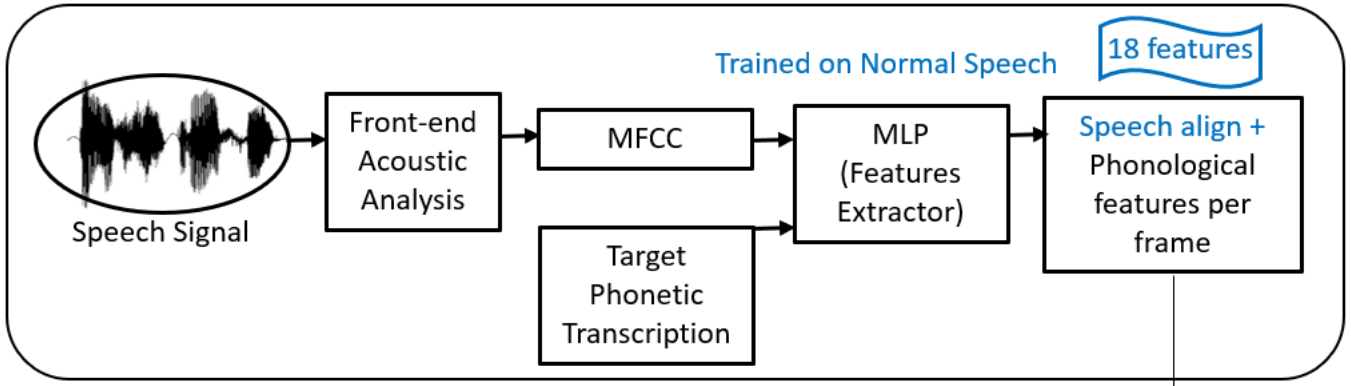
- The goal is to develop a software program for patients with articulation deficits.
- Intensive treatment program for improving articulation and consequently speech intelligibility, based on the principles of motor learning.
- Set of exercises embedded in an attractive and patient-friendly user interface.
- Visual and auditory support will be also included.
- Immediate feedback regarding the accuracy of the utterance and the type of articulation errors made.

Research Methodology, Results & Next Steps

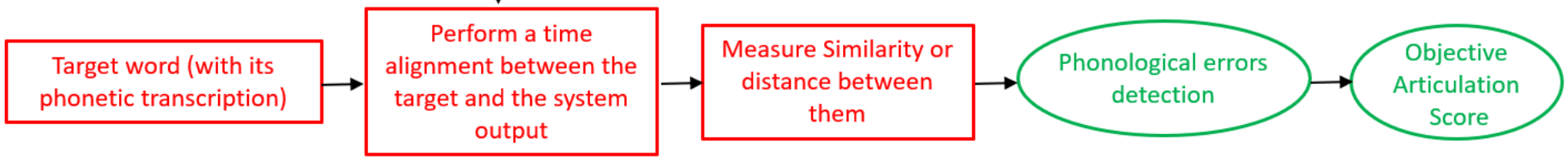
- Extensive database of exercises (already developed)
- The content of speech material
  - 2 different intensive training programs
  - **Articulatory drill** and **minimal pairs** (mono- and bisyllabic words)
  - 4 levels of difficulty in each program, structured per target position of the consonant, in **initial**, **medial** and **final** position in the words.
- On going:
  - Evaluation of the feasibility and effectiveness of the training programs
    - Selected items
    - Selected timing (duration of sessions, intensity, …)
    - Feedback for the patient
    - Effect of training

Next Steps Algorithms

Collaboration with imec-IDLab and IDIAP



Outputs of our system



Feedback regarding the accuracy of the target phonemes and the type of articulation errors made

Final Step User Interface

Concept

Planned Secondments

Fondation de L'Institut de Recherche IDIAP, Switzerland

- The Speech and Audio processing group

Starting on January 2020, for 3 months

Therapy Box Limited, United Kingdom

Company specialized in speech and language technology applications for people with disabilities

Starting on January 2021, for 3 months

Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany

Institut der Kasseler Stottertherapie (KST), Germany

Training, Conferences & Workshops

TE1 – Speech pathologies and therapies course

TE2 – Speech processing and machine learning workshop

Crash course “Speech signal processing” by prof. Demuynck, UGent

Overview of existing models for speech intelligibility, UGent

Interspeech Conference Graz, Austria, September 2019

Motor Speech Congress, UZA, October 2019

Outreach, Dissemination & Networking

- Present research outcomes in seminars and conferences.
- Dissemination of the results in academic publications (open literature).
- Patients should be addressed via their own therapy centers, or patient groups.
- The software program will be freely available.

TAPAS Impact

On the society

The VAT-project offers applicability for persons with articulatory disorders (dysarthria, hearing impaired and cleft palate patients).

It will increase the capacity of speech therapy for a lot of patients with practical limitations (distance, motor handicap, financial restrictions).

It will give patients the opportunity to practice more intensively and frequently (better outcome) in his own environment.

On my career

To finish my PhD and continue in the health care domain.

Thanks for your attention