



Contributors

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During the year

One of the key points of this project is to encourage mobility. Even with the pandemic situation, ESR's were able to go to their secondments physically or they did them virtually.

Regarding Training Events, the TE5 about entrepreneurship was done virtually via Zoom. It consisted of 6 live sessions and ended with a pitch session where ESR's had to pitch a « go to the market » idea based

on their research. It was organized last February by the University of Ghent. We are welcoming a new ESR in University of Ghent in Belgium : Abdessalem Hammani. We are also highlighting two PhDs who are graduating soon : Zhao Ren and Tomás Arias Vergara.

One of the major conference in our field, ICASSP just ended and 4 of our ESRs authored or co-authored a paper within this conference.

Next Training Event

Our upcoming TAPAS Training Event 6 will be fully held online on 24, 25, 30 June. It will be organized by the University of Augsburg and co-led by audEERING. It is directly targeted at industry and held towards the end of the network project. This event will be a unique opportunity to demonstrate the projects that emerged from TE5 for each ESR as well as the associated scientific results. In this event, we will invite professional industrial speakers to give talks and young scientists from the industry to communicate their experience.

Welcome

Abdessalem Hammami ESR at the University of Ghent, Belgium



Within the TAPAS project, my research topic is about generating phonological feedback for evidence-based speech therapy. The main goal of the research is to investigate the capacity of deep neural networks in capturing the high-level features of pathological speech. While several neural topologies have been used in the field of automatic speech recognition, Time Delay

Neural Networks implementations have shown considerable capabilities and have provided the current state-of-the-art results. My current task is to develop a robust Time Delay Neural Network model that can generalize well on atypical speech with the least number of parameters possible. This model will then be implemented in the ASISTO tool that is used for the evaluation of speech during the therapy process.

Highlights

Zhao Ren ESR at the University of Augsburg, Germany



I mainly worked on developing explainable and robust deep learning models from speech/audio signals for healthcare. During my PhD, I (co-)authored more than 30 publications in peer-reviewed book chapters / journals / conference proceedings and reviewed journal and conference papers. I also worked in audEERING GmbH for 3 months for my secondment.

A comprehensive improvement in my research was obtained from the TAPAS training events and many other activities (e.g., conferences) supported by TAPAS. I appreciated the experience and hope to keep learning from different people.

Tomás Arias Vergara ESR at LMU München, Germany



Cochlear Implants (CI) are the most suitable devices for severe and profound hearing loss. However, CI users often present altered speech production even after hearing rehabilitation. The aim of my work is to implement machine learning methods to evaluate speech production because in the long term including speech technology could lead to an increased rehabilitation success.

After three years in the TAPAS project, I can really say that it was a privilege to meet such talented people. The training events also offered wonderful opportunities to meet industrial and academic partners and I feel more prepared to start the next step in my career.

Selected publications

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Mendoza Ramos, V., Paulyn, C., Van den Steen, L., Hernandez-Diaz Huici, M. E., De Bodt, M., & Van Nuffelen, G. *Effect of boost articulation therapy (BART) on intelligibility in adults with dysarthria*. INTERNATIONAL JOURNAL OF LANGUAGE & COMMUNICATION DISORDERS, 56(2), 271-282

Ren Z., Han J., Cummins N., Schuller B. *Enhancing transferability of black-box adversarial attacks via lifelong learning for speech emotion recognition models*. INTERSPEECH, SHANGAI, CHINA, 2020

Cummins N., **Pan Y.**, **Ren Z.**, **Fritsch J.**, **Nallanthighal V.**, Christensen H., Blackburn D., Schuller B., Magimai-Doss M., Strik H., and Härmä A., A COMPARISON OF ACOUSTIC AND LINGUISTICS METHODOLOGIES FOR ALZHEIMER'S DEMENTIA RECOGNITION, INTERSPEECH, SHANGAI, CHINA, 2020

Pan Y., **Nallanthighal V.**, Blackburn D., Christensen H. and Härmä, A. *Multi-Task Estimation of Age and Cognitive Decline from Speech* ICASSP , TORONTO, CANADA, 2021

Arias-Vergara T., Klump P., **Vásquez-Correa J. C.**, Nöth E. , Orozco-Arroyave J.R., Schuster M., *Multi-channel spectrograms for speech processing applications using deep learning methods*, PATTERN ANALYSIS AND APPLICATIONS, Springer, 2021

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Hermann E., Kamper H., Goldwater S., *Multilingual and Unsupervised Subword Modeling for Zero-Resource Languages*, COMPUTER SPEECH AND LANGUAGE 2021

Fritsch J., Magimai-Doss M. *Utterance Verification-Based Dysarthric Speech Intelligibility Assessment Using Phonetic Posterior Features* IEEE SIGNAL PROCESSING LETTERS 2021

Illa M., **Halpern B. M.**, van Son R., van den Brekel M., Moro-Velazquez L., Scharenborg O. *Pathological voice adaptation with autoencoder-based voice conversion*, ISCA SPEECH SYNTHESIS WORKSHOP 2011

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