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### Brief description

There are an increasing number of people across Europe with debilitating speech pathologies (e.g., due to stroke, Parkinson's Disease, etc). These groups face communication problems that can lead to social exclusion. They are now being further marginalised by a new wave of speech technology that is increasingly woven into everyday life but which is not robust to atypical speech. TAPAS is a Horizon 2020 Marie Skłodowska-Curie Actions Innovative Training Network European Training Network (MSCA-ITN-ETN) project that aims to improve the well-being of these people. TAPAS adopts an inter-disciplinary and multi-sectorial approach. The consortium includes clinical practitioners, academic researchers and industrial partners, with expertise spanning speech engineering, linguistics and clinical science. All members have expertise in some element of pathological speech. This rich network will train a new generation of 15 researchers, equipping them with the skills and resources necessary for lasting success.

### Q&A for ESRs

#### How did you hear about the TAPAS network?

**TOMÁS ARIAS** *My supervisor in Colombia got the news from his former PhD supervisor. Then on the web page I looked through all the projects and applied to the one I'm currently working on.*

**SHRIKANTH NALLANTHIGHAL** *I saw an advertisement of TAPAS on the webpage of marie curie PhD positions, during my pursuit of Phd positions on research related to technological solutions for diagnosis of pathological conditions. Following that, I got to know the position in Philips Research, Eindhoven.*

## Q&A for ESRs

**What is it like to do your PhD within an ITN-ETN framework? In your opinion, what are the main advantages of being part of the TAPAS network?**

ENNO HERMANN *I really enjoy the advantages that this programme provides, especially the large number of involved students and researchers from many different disciplines and the generous travel allowance that enables us to meet in person on a regular basis. I think the project sensibilises me to build software that is more accessible to people with special needs and also provides me with a diverse training that will help me in my future career.*

TIMOTHY POMMÉE *In my opinion, the main advantages are the networking opportunities and the « group » spirit. We are 15 PhD students in different European countries who are part of a common project with biannual seminars. These allow us to share our acquired knowledge, but also, of course, to spend some quality time together and share our PhD experiences! The ITN-ETN framework also promotes mobility and allows us to travel in order to share and acquire knowledge, collaborate on our projects, disseminate and widen our professional network.*

**How do you think the project and network will help you for the future ?**

JUAN CAMILO VASQUEZ CORRÉA *They will give me tools and knowledge to face new research problems after my PhD, and also the created network will give me high possibilities to continue collaborating in further research initiatives.*

VIVIANA MENDOZA *The project has opened already new horizons in our professional lives and for the future, the network offers all the contacts necessary to continue working in the field of pathological speech processing with a fruitful collaboration.*

**You just had a session in TE4 about equity, diversity and inclusivity. What is your feeling about that in your daily work as a researcher? And for the application of your work how your topic can help in this matter?**

ZHAO REN *In my daily work, the session will be helpful for me to consider more about equity among people. With the consideration of some special requirements of people, such as people with disabilities, we can develop better and more easily-used applications/algorithms, as our motivation is to help people's life.*

## Q&A for ESRs

THOMAS ROLLAND *TE4 brings us the idea that we should work more with clinicians and to keep our system/application simple to be effective. On a daily basis, I try to apply the knowledge I got from the clinicians at UZA (Antwerp, Belgium). I deeply believe and hope that my work will help children with pathological speech to be more included in the society and live a normal childhood.*

### How did you cope during the last few months of quarantine due to the Covid-19 crisis? Was your PhD life somehow different?

SEBASTIÃO QUINTAS *The main difference I felt during the confinement was the adaptation to work from home. The adaptation itself was fairly straightforward and I was able to do pretty much everything from home, however the lack of social contact was probably the hardest part.*

WEI XU *I stay at home every day and keep working on my research. I think it influenced my PhD life in the same way as many other people feel. I miss my colleagues but I am also lucky that I can still make some progress. I know that many people cannot because the labs they do experiments were locked down.*

### How do you conceive the end of your PhD? What do you plan to do after your PhD?

YILIN PAN *I hope what I have done and will do during my PhD can be useful in real life, rather than only the paper research. I also hope my research topic can proceed after my graduation. Hopefully, I will then start to transfer my research knowledge into products that can benefit elderly people. To realize it, maybe I will go to the company which has related research topics.*

ZHENGJUN YUE *It is an achievement of a stage of learning, and more importantly, it is a new start of my life, either for study or work. Regarding what I will do after, I haven't got a specific plan yet. I might do Postdoc for a few years and then teach in the University. Or might work in industry companies directly.*

JULIAN FRITSCH *Since EPFL's PhD program is 4 years I'm only half way through, but it feels good to have more experience by now. I plan to find a job in a related subject in industry, though I do not know yet which country that will be in.*

BENCE HALPERN *I will explore my opportunities after my PhD. I have an idea for a project that I could do based on the experience that I acquired during my PhD, which would take the form of a postdoc and grant writing process. Still, I am curious about exploring speech technology in an industrial setting, but I don't want to close the door for academia.*

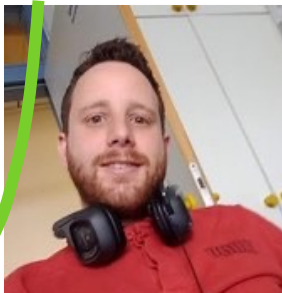
## Highlights

**Timothy Pommée** ESR at Université Paul Sabatier, Toulouse, France



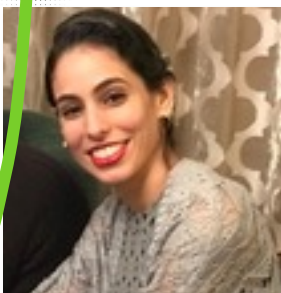
I am working on the use of acoustic measures to characterize speech sounds, especially in disordered speech. My PhD thesis can basically be divided in two parts: first, gather as much data as possible on speech intelligibility measures from the literature, but also and foremost from clinicians, researchers, as well as patients. Once I have a clear picture of what has already been done and what is needed by clinicians and researchers, I can eventually do some hands-on. For that, I use recordings of healthy talkers as well as from patients, and I analyze these audio recordings using various measures. The end goal is to find out which of these measures are clinically relevant and can be used to create speech assessment tools for clinicians treating motor speech disorders.

**Juan Camilo Vasquez Corréa** ESR at Friedrich-Alexander-Universität Erlangen Nuernberg, Germany



My work is focused on modeling the disease progression of Parkinson's patients via speech. The traditional assessment and diagnosis of the disease depend to some extent on the experience of the clinician performing the screening, which makes the determination of the exact type of disease as well as its degree of severity. Hence, it is important to identify accurate bio-markers for early and differential diagnosis, severity, and response to therapy of Parkinson's patients. A systematic approach for continuous monitoring of the state of the patients will help in slowing down the impact of the disease, and to improve the quality of life of patients.

**Viviana Mendoza** ESR at Antwerp University Hospital, Belgium



The development of a software program for patients with speech impairments, mainly with articulation deficits. The goal of the software is to guide the patient through an intensive treatment program for improving articulation and consequently speech intelligibility. This might help people with speech and language disorders to create better chances in their life, after traumatic brain injuries, stroke, or comparable lesions.

## Selected publications

**Quintas S.**, Mauclair J., Woisard V., Pinquier J. Automatic Prediction of Speech Intelligibility based on X-vectors in the context of head and neck cancer. INTERSPEECH, SHANGAI, CHINA, 2020

**Mendoza V.**, Kairuz H.A., Hernandez-Diaz M.E., Martens H., Van Nuffelen G., De Bodt M. *Acoustic features to characterize sentence accent production in dysarthric speech*. BIOMEDICAL SIGNAL PROCESSING AND CONTROL, VOL 57, 101750, ISSN 1746-8094, 2020.

**Ren Z.**, Han J., Cummins N., Kong Q., Plumbley M., and Schuller B., *Multi-instance learning for bipolar disorder diagnosis using weakly labelled speech data*. DPH, MARSEILLE, FRANCE, PP. 79–83, 2020

**Xue W.**, **Mendoza V.**, Harmsen W., Cucchiarini C., van Hout R.W.N.M. , Strik H., *Towards a comprehensive assessment of speech intelligibility for pathological speech*. INTERSPEECH, SHANGAI, CHINA, 2020

**Halpern B. M.**, van Son R., van den Brekel M., Scharenborg O. *Detecting and analysing spontaneous oral cancer speech in the wild*. INTERSPEECH, SHANGAI, CHINA, 2020

**Arias-Vergara T.**, Orozco-Arroyave J.R., Cernak M., Gollwitzer S., Schuster M., Nöth E. *Phone-attribute posteriors to evaluate the speech of cochlear implant users*. INTERSPEECH, GRAZ, AUSTRIA, PP. 3108-3112, 2019.

**Rolland T.** *Transfer learning from adult to children for children speech automatic speech recognition*. INTERNAL REPORT , 2020

Orozco-Arroyave, J. R., **Vásquez-Correa, J. C.**, et al. *Apkinson: the smartphone application for telemonitoring Parkinson's patients through speech, gait and hands movement*. NEURODEGENERATIVE DISEASE MANAGEMENT, 2020.

**Pan Y.**, Mirheidari B., Reuber M., Venneri A., Blackburn D., Christensen H. *Automatic Hierarchical Attention Neural Network for Detecting AD*. INTERSPEECH, GRAZ, AUSTRIA, PP. 4105-4109, 2019.

**Hermann E.**, *Dysarthric Speech Recognition with Lattice-Free MMI*. ICAASP, BARCELONA, SPAIN, PP 2109-2113, 2020

**Pommée T.**, *Relationship between phoneme-level acoustic variables and speech intelligibility in healthy speech: A systematic review*, JOURNAL OF COMMUNICATION DISORDERS, 2020

**Nallanthighal V. S.** , Härmä A., and Strik H., *Speech Breathing Estimation Using Deep Learning Methods*, ICASSP BARCELONA, SPAIN, PP. 1140-1144 , 2020.

**Fritsch J.**, Pavankumar S., Magimai-Doss M. *Estimating the Degree of Sleepiness by Integrating Articulatory Feature Knowledge in Raw Waveform Based CNNs*, . ICAASP, BARCELONA, SPAIN, PP 6534-6538, 2020

**Yue, Z.**, Xiong, F., Christensen, H., and Barker, J. *Exploring Appropriate Acoustic and Language Modelling Choices for Continuous Dysarthric Speech Recognition*. ICASSP BARCELONA, SPAIN, PP. 6094-6098, 2020

## Social Media



[www.tapas-etn-eu.org](http://www.tapas-etn-eu.org)



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