PhD Position: Modelling speech intelligibility based on the signal-to-noise ratio in the modulation domain

Centre for Applied Hearing Research, Technical University of Denmark (DTU)

Proposed starting date: August 1, 2012
Closing date for applications: April 15, 2012

The INSPIRE Marie Curie Initial Training Network

As a PhD student you will participate in the FP7 Marie Curie Initial Training Network Investigating Speech Processing In Realistic Environments (INSPIRE). This network provides research opportunities for 13 PhD students and 3 postdocs. You will become a member of an international team of researchers whose aim is to gain a better understanding of how listeners recognize speech, even under non-ideal circumstances. You will contribute to urgently needed solutions that help alleviate the serious communication problems that arise, especially for older and hearing-impaired persons, when different combinations of 'adverse' conditions affect the speech processing system.

Topic

As a PhD student you will investigate the modeling of speech intelligibility based on the signal-to-noise ratio in the modulation domain. A major challenge is to solve the "noise reduction paradox" that refers to the mismatch between predicted and actual speech intelligibility following noise reduction signal processing. It is postulated here that the ratio of the speech-to-noise energy in the modulation domain at the output of auditory signal processing is an important indicator of speech intelligibility, in contrast to the STI that considers only effects on the (speech) signal. Various distortions in transmission channels and effects of hearing-instrument processing are analyzed in this framework. The work is relevant for the evaluation of hearing-instrument algorithms, but also in context- and listener-specific speech modification to improve communication with automatic dialogue systems for groups such as the elderly or non-natives in realistic conditions.

Host

This project will be supervised by Prof. Torsten Dau and carried out at the Centre for Applied Hearing Research (CAHR) at the Technical University of Denmark (DTU). At the centre, we conduct fundamental and applied research with a focus on human speech communication, auditory processing and perception, hearing impairment and hearing instruments. For more information about CAHR, please visit our website: http://www.dtu.dk/centre/cahr/English.aspx

This position will also be co-supervised by Dr. Mark Huckvale (Department of Speech, Hearing and Phonetic Sciences, University College London). As part of the project, you will also spend a few months at UCL.

Employment conditions

- Full-time, 36 months duration
- The annual salary is in accordance with both ITN and Danish regulations.
- In addition to the salary, you will receive travel and training allowances on the basis of generous Marie Curie ITN provisions

Requirements

To apply, you should have the following:

- Hold a Master's degree in engineering or science
- Have a strong background in some of the following: speech perception; speech processing; auditory signal processing; engineering acoustics
- Be willing to spend several months at two placements: University College London and with one of the associated INSPIRE partners.
- Be available to start on August 1, 2012

You must also comply with the FP7 Marie Curie rules for ITNs:

- You must not have resided or performed your main research activity in Denmark for more than 12 months in the last three years
- You must be willing to work in at least one other country in the INSPIRE network
- You must have fewer than 4 years of research experience since you obtained your Masters degree, and not hold a PhD

The Technical University of Denmark is an equal opportunity employer. Female researchers are strongly encouraged to apply for this vacancy.

To find out more

Further information about INSPIRE can be found here:
http://www.ru.nl/clst/projects/speech/inspire/
or contact Prof. Torsten Dau, tdau@elektro.dtu.dk

How to apply

If interested, please send the following to Caroline van Oosterhout (cvo@elektro.dtu.dk):

- CV
- 2-page description of your research interests explaining why this position e INSPIRE goals appeal to you, how the INSPIRE team may benefit from your participation, and your career perspectives as expected from INSPIRE
- university transcripts
- names and email addresses of two referees that we will contact

Please submit your application before April 15, 2012.