



The  
University  
Of  
Sheffield.

Department  
Of  
Computer  
Science.

<b>Title of Project:</b>	PhD Position in Adaptive Deep Learning for Speech and Language
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<b>Supervisor:</b>	Professor Thomas Hain
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<b>Deadline for Applications:</b>	13th April 2023
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The LivePerson Centre for Speech and Language offers a 3 year fully funded PhD studentship covering standard maintenance, fees and travel support, to work on deep neural network adaptive learning modules for speech and language. The Centre is connected with the Speech and Hearing (SpandH) and the Natural Language Processing (NLP) research groups at the Department of Computer Science at the University of Sheffield.

Domain mismatch remains a key issue for speech and language technologies for which traditional solutions are transfer learning and adaptation. The latter was widely used for modelling of speech in the context of generative models, however less so with modern neural network approaches. Such adaptation targeted features or models and was often informed by previous model output and estimates of latent factors. These approaches were often informed by observations on human abilities to adapt and adjust to new acoustic or semantic situations. Adaptation in neural networks is model based and often implicit - through attention or dynamic convolution. However, these methods to date still fail to reproduce the rapid learning and adaptation that humans exhibit when being exposed to new contexts.

The objective in this project is to conduct research into neural network structures that are capable of rapidly adjusting to a change in latent factors and at the same time allow for robust control. This will require rapid feedback mechanisms on the mismatch between the observed data and the model expectation. A range of strategies may be applied - through instantaneous feedback or through control of transformational model parameters. All proposals are to be implemented and tested on speech, and where suitable, also language data. Experiments should be conducted on a range of tasks of different complexity in the context of different data types.

The student will join a world-leading team of researchers in speech and language technology. The LivePerson Centre for Speech and Language Technology was established in 2017 with the aim to conduct research into novel methods for speech recognition and general speech processing, including end-to-end modelling, direct waveform modelling and new approaches to modelling of acoustics and language. It has recently extended its research remit to spoken and written dialogue. The Centre hosts several Research Associates, PhD researchers, graduate and undergraduate project students, Researchers and Engineers from LivePerson, and academic visitors. Being fully connected with SpandH brings collaboration, and access to a wide range of academic research and opportunities for collaboration inside and outside of the University. The Centre has access to extensive dedicated computing resources (GPU, large storage) and local storage of over 60TB of raw speech data.

The successful applicant will work under the supervision of Prof. Hain who is the Director of the LivePerson Centre and also Head of the SpandH research group. SpandH was and is involved in a large number of national and international projects funded by national bodies and EU sources as well as industry. Prof. Hain also leads the UKRI Centre for Doctoral Training In Speech and Language Technologies and their Applications (<https://slt-cdt.ac.uk/>) - a collaboration between the NLP research group and SpandH. Jointly, NLP and SpandH host more than 110 active researchers in these fields.

This project will start as soon as possible.

*If English is not your first language, you must have an IELTS score of 6.5 overall, with no less than 6.0 in each component.*

**How to Apply:**

All applications must be made directly to the University of Sheffield using the Postgraduate Online Application Form.

Information on what documents are required and a link to the application form can be found here - <https://www.sheffield.ac.uk/postgraduate/phd/apply/applying>

On your application, please name Prof. Thomas Hain as your proposed supervisor and include the title of the studentship you wish to apply for.

Your research proposal should:

- Be no longer than 4 A4 pages, including references
- Outline your reasons for applying for this studentship
- Explain how you would approach the research, including details of your skills and experience in the topic area

If you have any queries, please contact [phd-compsci@sheffield.ac.uk](mailto:phd-compsci@sheffield.ac.uk)

**Funding Details:**

This position is fully funded by LivePerson, covering all tuition fees and a stipend at the standard UKRI rate.