The Centre for Acoustic Signal Processing Research (CASPR) is a newly founded centre at the Section for Signal and Information Processing, Department of Electronic Systems, Aalborg University, Denmark. CASPR is supported by the Oticon Foundation, Oticon A/S, and Aalborg University.

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CASPR is conducting research related to advanced statistical signal processing solutions for assistive listening. The research finds direct use in communication devices such as hearing aids, helmets, headphones, cochlear implants, ear monitor, ear pieces, diagnostic equipment, etc. However, the envisioned research also finds use in related areas such as robust speech/speaker recognition, brain computer interfaces, acoustic event detection, etc.

The scientific scope of CASPR encompasses:

- statistical signal processing
- machine learning
- information and communication theory with applications to wireless exchange of information between listening devices and other external devices
- pattern recognition
- data mining in body worn sensor data
- perception-based statistical signal processing

CASPR will navigate in a rapidly changing technological landscape: we envision a near future, where the technological landscape allows very different, and better, hearing assistive devices than are known today. Specifically, we envision that near-future hearing assistive devices will:

- increase the wireless exchange of information with each other, with other body-worn devices and with devices outside the body.
- make use of additional microphones on or outside the body, and will employ other types of body-worn or outside-the-body sensors.
- work in a much closer symbiosis with the user.
Courses related to CASPR

A significant part of CASPR has to do with teaching at B.Sc., M.Sc., PhD., and Postdoc level in disciplines that are relevant to the scientific scope of CASPR:

- Machine Learning (Master and PhD courses), Fall+Spring, 2017
- Deep Learning (PhD course), Spring 2017
- Information Theory (Master and PhD courses), Fall 2017
- Array Processing (Master course) Fall 2017
- Optimization (Master and PhD courses), Fall 2017
- Platforms and Methods for Multimodal System Architectures (Master course), Fall 2017.
- Signal Processing for Hearing Assistive Devices (PhD course and Winter School), Fall 2017.

Current Student projects within CASPR

- “Sound Source Localization for Hearing Aids”.
On March 2nd, 2017, CASPR was officially opened. The event took place at Aalborg University and included speeches from Eskild Holm Nielsen, Dean of the Technical Faculty of ICT and Design, AAU, Finn Möhring, Vice President at Oticon A/S, Børge Lindberg, Head of Department of Electronic Systems, AAU, and Claus Nielsen, Eriksholm, Oticon A/S. The event hosted more than 60 participants including industrial participants, students and researchers.

Børge Lindberg, Head of Department of Electronic Systems, AAU.

Research audiologist from Oticons audiological research center, Claus Nielsen places hearing loss and hearing aids in a historical perspective.
A reception was set up in the main hall. At the reception, the PhD students in the Section for Signal and Information Processing (SIP) presented their latest research on posters, and demos and lab tours were given.

The following demos were given at the event:

- Detection of words in noise
- DNN for speech enhancement
- Social Robots (iSocioBot)
- Multi microphone speech enhancement
- Hearing aids hands-on

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List of posters presented at the inauguration of CASPR.
On February 2nd, 2017, Professor Patrick Naylor from Imperial College London, visited our group and gave a presentation entitled "Measurement and Exploitation of Reverberation in Speech signals".

CASPR is pleased to announce an upcoming Winter School on Signal Processing for Hearing Assistive Devices, to be held at Aalborg University, Denmark on Nov.6 – 10, 2017. The winter school targets researchers and engineers in the sound processing field. Lectures are given by international experts, which cover areas such as basic auditory perception, beamforming, noise reduction, dereverberation, feedback cancellation, hearing loss compensation, cochlear implants, screening of hearing in newborns, and emerging technologies. More information to follow.


Best paper award ceremony at the ICASSP conference in New Orleans, USA, March 2017. From left: Dr. C. H. Taal (Quby Labs, Amsterdam), Assistant Prof. R. C. Hendriks (Delft University of Tech.), R. K. Ward (President IEEE Signal Proc. Society), Assoc. Prof. R. Heusdens (Delft University of Tech.), Prof. J. Jensen (Aalborg University).

Please visit the CASPR website http://caspr.es.aau.dk for more news.
### Journal Papers


### Conference Papers


CASPR will have a number of fully funded PhD stipends available in 2017. We are looking for highly motivated, independent, and outstanding students that desire to do a successful 3-year PhD programme at Aalborg University. The ideal candidates must have strong expertise in one or more of the following disciplines: statistical signal processing, auditory perception, machine learning, information theory, or estimation theory. Good English verbal and written skills are a must. Excellent undergraduate and master degree grades are desired. PhD positions in Denmark are fully funded, i.e. no tuition fees, and come with a salary. The salary is subject to a pay grade system based on prior working experience since completing your undergraduate degree. The yearly gross salary is in the range 41,500 – 50,100 Euros.

You may obtain further information about the PhD stipends from Professor (MSO) Jan Østergaard (jo@es.aau.dk), Associate Professor Zheng-Hua Tan (zt@es.aau.dk), or Professor Jesper Jensen (jj@es.aau.dk), CASPR, Aalborg University, concerning the scientific aspects of the stipends.

Aalborg University (http://www.en.aau.dk/) is one of the leading Danish universities with campuses in Aalborg, Esbjerg and Copenhagen. The student population of AAU comprises of around 21,000 regular (both undergraduate and postgraduate) students and 947 PhD students. AAU is famous for its innovative problem and project based learning approach (PBL) where students work on team-based projects solving ‘real-life’ problems in collaboration with organisations or companies. Aalborg University is acknowledged for collaboration with industry and according to Shanghai/ARWU World Rank, Aalborg University is no.7 in the world within the research field of Electronic and Electrical Engineering. According to Times Higher Education, Aalborg University is no. 201-250 in the overall world university ranking, and no. 31 in the Top 100 of universities established within the past 50 years.