Cooperative Research Centre for Cochlear Implant & Hearing Aid Innovation

CRC HEAR

CENTRE MISSION

The unifying mission of the Cooperative Research Centre for Cochlear Implant and Hearing Aid Innovation (CRC HEAR) is to improve communication for the millions of hearing-impaired adults and children in Australia and the rest of the world through hearing, education and research.

OBJECTIVES

The Centre couples the individual strengths of the Parties into multidisciplinary research leading to:
- innovations enabling new hearing technology products;
- innovative clinical procedures that enhance benefits to users of hearing devices;
- innovative approaches expanding professional training;
- innovative technology transfer activities to ensure that Centre research and education outcomes result in improved communication benefits for hearing impaired adults and children.

In Australia alone, over 2 million adults and children suffer from hearing disabilities. With rising noise levels in everyday life, and the aging of the population, the number of people with hearing impairments is likely to rise. Australian Bureau of Statistics survey data show that hearing loss will affect 1 in every 10 Australians, leading to increased social isolation and medical problems, as well as decreased quality of life.

CRC research and innovations are enabling new products that will help to restore near-normal listening for some of those affected. Importantly, CRC HEAR is seeking innovative technology transfer activities to ensure that Centre research and education outcomes result in improved communication benefits for hearing impaired adults and children.

CRC HEAR – COMMERCIALISATION

SPEAR3 Speech Research System comprises an advanced DSP together with programming software and a sound processor suitable for unilateral or bilateral cochlear implant and/or hearing aid research.

Adaptive Dynamic Range Optimisation (ADRO)

Adaptive Dynamic Range Optimisation is an advanced digital signal processing software, which produces improved speech perception and quality of sound for cochlear implant users (through Cochlear Limited) and hearing aid users (through CRC spinoff – Dynamic Hearing).

SoundShield the world’s best acoustic shock protection device for users of telephone headsets, now manufactured by Polaris Communications.

NAL-NLL is a software program for prescription fitting of hearing aids that maximises speech intelligibility for hearing aid users.

Audiology and Clinical Education Products, Word/Sentence Perception Test Audio CDs, CASALA (Computer Aided Speech and Language Analysis), DI-E First Words (early language development software).

Postgraduate and Professional Educational Services

CRC HEAR offers opportunities for post graduate research in our fields, and intensive four and five-day training courses covering all aspects of cochlear implant surgery, patient selection and rehabilitation, designed for audiologists, surgeons and clinicians.

Contract Research

DSP Engineering in Communications

CRC HEAR offers experience in the development of speech processing strategies for use in hearing aids, cochlear implants and telecommunications equipment. Such strategies are designed to maximise speech intelligibility and hearing comfort, in a variety of hearing conditions. CRC HEAR can develop algorithms to meet the needs of the strategy, or create programming to implement an existing algorithm. Our programmers have expertise with a variety of software packages including Borland C++ and Matlab.

Microwave Imaging X-ray & Fluorescopy

CRC HEAR has a specialised facility for microwaves imaging X-ray and fluoroscopy. We can produce quality digital images of small equipment components and anatomical and anatomical specimens. The images offer precise details of internal anatomical details and component position.

Clinical trials

CRC HEAR offers expertise in clinical assessment of therapeutic hearing devices such as hearing aids and audiological equipment. Our audiological and scientific staff are trained in clinical trial and analysis, and have conducted a clinical trial and analysis the resultant data or provide expert advice as required.

CRC HEAR ~ fostering Hearing, Education & Research

CRC HEAR is an unincorporated joint venture, dedicated to developing hearing prosthetics and procedures to improve communication for hearing-impaired adults and children. CRC HEAR has built on the successful relationship between Cochlear Limited and The University of Melbourne, which contributed to the development and market success of the Nucleus family of multiple-channel cochlear-implant. CRC HEAR links these two organisations together with The Bionic Ear Institute and the National Acoustics Laboratories into a major collaborative research entity, capable of conducting interdisciplinary research across a wide range of cochlear implant and hearing aid technologies. CRC HEAR also incorporates 14 Support Parties, each providing specialist technological know-how or commercial expertise. CRC HEAR collaborates with international research centres in the fields of cochlear implants and hearing aids and works with the Parties to develop new markets for Australian hearing prosthetics.

CORE PARTIES

Australasian Hearing (National Acoustics Laboratories)

The Bionic Ear Institute

Cochlear Limited

The University of Melbourne (Department of Otolaryngology & Department of Learning and Educational Development)

SUPPORT PARTIES

Research teams in CRC HEAR benefit from combined expertise and infrastructure support of 14 Support Parties, spread geographically across a number of Australian states.

New South Wales-based Parties:

- The University of Sydney, Department of Surgery
- Children’s Hospital Westmead (The Sydney Cochlear Implant Centre (NSW))
- The University of New South Wales, Audiology

Victoria-based Parties:

- The Audlogical Society of Australia Inc
- The Royal Victorian Eye and Ear Hospital, Cochlear Implant Clinic
- St Mary’s School for Children with Impaired Hearing
- The H.E.A.R.T. School for Hard of Hearing Children
- The Sheepdog Centre for Deaf Children and Their Parents (NSW)
- Taralye (The Advisory Council for Children with Impaired Hearing, Victoria)
- Queensland-based Parties:
- Griffith University (and the MicroTechnology CRC)
- The Hear and Say Centre for Deaf Children and Their Parents

Queensland Hearing

OTHER COLLABORATIVE PARTIES (AUSTRALIAN & INTERNATIONAL)

Kilimanjaro Cochlear Clinic
Manchester Cochlear Implant Clinic
Massachusetts Institute of Technology
New York University Medical Centre
University of Freiburg HMKU Klinik
University of Iowa
University of Hong Kong
Washington University School of Medicine

CRC HEAR’s links with these Australian and international research and clinical groups allows for more rapid accumulation of results and focused collaborations. It also adds to the international applicability of research outcomes, which have been independently verified in a number of research centres.

An exciting new project with the University of Hong Kong will address speech processing for speakers of tonal languages.

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