ReSound

For people with Cochlear Implants

Spring 2019 **Issue 62**

A field of spring Crocus

Manchester Cicada — a charity supporting implant patients

This newsletter has been produced on behalf of the Manchester CICADA Charity

contents

Editorial

Welcome to the Spring edition of Resound.

Following a successful AGM at Gaskell house we are now getting into our program of events for the year, the first few of which have taken place which we have reports on.

One of the topics we highlighted in the last issue was the important part played by Bluetooth technology in many of the devices we use. In this issue we focus more on another subject which is increasingly in the news which is Artifical Intelligence. From the many ways in which it is used in everyday things such as emails, to its increasing use in hearing devices and beyond, hopefully the article will shed some light on the subject without being too technical.

On our website you will find lots of information from back copies of Resound to links to help and useful information.

As new Apps become available from companies such as Google we will update our Apps page so be sure to check in from time to time.
CICADA continues to work closely with the Implant team at the MRI and and also other hospitals such as Tameside General to help both new and existing CI users and our members are actively engaged with other charities such as Hearing Link, NADP and ATLA. If you think that you could help your local hospital in any way do get in touch with anyone from the EC and we will do all we can to help.

We welcome new members to CICADA many of whom have joined via the Website and with help from MRI.

We hope you enjoy this issue and if you have any comments, or stories to send along then please let me know.

Kevin Williams - Editor

AGM and Tour of Gaskell House

On 29th March we held our AGM at Gaskell House in Manchester.

Those of us who had been on a previous visit to the house in 2016 perhaps didn't realise the extensive conference facilities that were available.

This year we changed the format of the day to begin with the Admin (the AGM itself) and then lunch to be followed by a guided tour of the house.

It was a really good tour as it was just for ourselves and the guide was very knowledgable about Elisabeth Gaskell and all her friends of the time including Charles Dickens and the Brontë family.

Had we known that this dining room was available for lunch we might have booked it!

Deaf children to get life-changing surgery

by Mark Gould

NHS England has announced that Manchester University NHS Foundation Trust and Guy's and St Thomas' NHS Foundation Trust in London will offer cutting-edge auditory brainstem implant surgery

It will be available for children who are profoundly deaf, aged five or under, who are unable to use conventional hearing aids or implants because their cochlea or auditory nerve did not develop properly.

The complex procedure involves inserting a device directly into the brain to stimulate hearing pathways, bypassing the cochlea and auditory nerve that have not developed properly. It is estimated that about 15 children per year would be assessed for auditory brainstem implantation and that about nine would go on to have the surgery, which costs around £60,000 per patient.

After the implant has been inserted, long-term support is crucial to help children learn to listen and understand new signals from their implant. This may be as simple as recognising their own name being called, but it may also involve understanding simple phrases.

The national service is being led by neurosurgeon, Mr Scott Rutherford, from Manchester University NHS Foundation Trust, and Professor Dan Jiang, from Guys and St Thomas' NHS Foundation Trust, who will work with a dedicated team of highly specialised surgeons, audiologists and speech and language therapists.

Mr Rutherford said: "Manchester University NHS Foundation Trust is delighted to be chosen as one of only two centres in the UK to offer auditory brainstem implants as a treatment for children born without hearing nerves.

"A commitment by NHS England to fund the service for children will secure its future and allow more families to benefit from our clinical expertise."

And Professor Jiang, added: "The London Auditory Brainstem Implant service located at St Thomas' Hospital has combined the clinical expertise from Guy's and St Thomas', University College London Hospital, King's College Hospital and four hearing implant centres in London, it will provide easy access to this highly specialised service for all children with these rare conditions."

Professor Stephen Powis, NHS medical director, said: "This truly life-changing surgery, which allows youngsters to hear their parents' voices for the first time, will now be available across England for children who are deaf who have no other options.

"As we put the NHS Long Term Plan into practice, the health service will continue to make the very latest, innovative treatments, like this, available to patients across the country along with world class care."

Gemma Twitchen, senior audiologist at the charity Action on Hearing Loss, said: "Its fantastic news that some deaf children, who are unable to wear conventional hearing aids or implants due to under developed cochlear or auditory nerves, will be given the option to be assessed for pioneering surgery and long-term support they need to access the sensation of sound. Whilst this will only affect a small group of children per year, it's positive to see some forward thinking, with services for deafness hearing loss being implemented as opposed to cut and parents given greater choice to support their child."

Experimental brain-controlled hearing aid decodes, identifies who you want to hear

Engineers develop new AI technology that amplifies correct speaker from a group; breakthrough could lead to better hearing devices

Our brains have a remarkable knack for picking out individual voices in a noisy environment, like a crowded coffee shop or a busy city street. This is something that even the most advanced hearing aids struggle to do.

But now Columbia engineers are announcing an experimental technology that mimics the brain's natural aptitude for detecting and amplifying any one voice from many. Powered by artificial intelligence, this brain-controlled hearing aid acts as an automatic filter, monitoring wearers' brain waves and boosting the voice they want to focus on.

Though still in early stages of development, the technology is a significant step toward better hearing aids that would enable wearers to converse with the people around them seamlessly and efficiently. "The brain area that processes sound is extraordinarily sensitive and powerful; it can amplify one voice over others, seemingly effortlessly, while today's hearings aids still pale in comparison," said Nima Mesgarani, PhD, a principal investigator at Columbia's Mortimer B. Zuckerman Mind Brain Behavior Institute and the paper's senior author. "By creating a device that harnesses the power of the brain itself, we hope our work will lead to technological improvements that enable the hundreds of millions of hearing-impaired people worldwide to communicate just as easily as their friends and family do."

Modern hearing aids are excellent at amplifying speech while suppressing certain types of background noise, such as traffic. But they struggle to boost the volume of an individual voice over others. Scientists calls this the cocktail party problem, named after the cacophony of voices that blend together during loud parties.

"In crowded places, like parties, hearing aids tend to amplify all speakers at once," said Dr. Mesgarani, who is also an associate professor of electrical engineering at Columbia Engineering. "This severely hinders a wearer's ability to converse effectively, essentially isolating them from the people around them."

The Columbia team's brain-controlled hearing aid is different. Instead of relying solely on external sound-amplifiers, like

microphones, it also monitors the listener's own brain waves.

"Previously, we had discovered that when two people talk to each other, the brain waves of the speaker begin to resemble the brain waves of the listener," said Dr. Mesgarani.

Using this knowledge the team combined powerful speech-separation algorithms with neural networks, complex mathematical models that imitate the brain's natural computational abilities.

They created a system that first separates out the voices of individual speakers from a group, and then compares the voices of each speaker to the brain waves of the person listening. The speaker whose voice pattern most closely matches the listener's brain waves is then amplified over the rest. The researchers published an earlier version of this system in 2017 that, while promising, had a key limitation: It had to be pretrained to recognize specific speakers.

"If you're in a restaurant with your family, that device would recognize and decode those voices for you," explained Dr. Mesgarani. "But as soon as a new person, such as the waiter, arrived, the system would fail."

Today's advance largely solves that issue. With funding from Columbia Technology Ventures to improve their original algorithm, Dr. Mesgarani and first authors Cong Han and James O'Sullivan, PhD, again harnessed the power of deep neural networks to build a more sophisticated model that could be generalized to any potential speaker that the listener encountered.

"Our end result was a speech-separation algorithm that performed similarly to previous versions but with an important improvement," said Dr. Mesgarani. "It could recognize and decode a voice -- any voice -- right off the bat."

To test the algorithm's effectiveness, the researchers teamed up with Ashesh Dinesh Mehta, MD, PhD, a neurosurgeon at the Northwell Health Institute for Neurology and Neurosurgery and coauthor of today's paper. Dr. Mehta treats epilepsy patients, some of whom must undergo regular surgeries.

"These patients volunteered to listen to different speakers while we monitored their brain waves directly via electrodes implanted in the patients' brains," said Dr. Mesgarani. "We then applied the newly developed algorithm to that data."

The team's algorithm tracked the patients' attention as they listened to different speakers that they had not previously heard. When a patient focused on one speaker, the system automatically amplified that voice. When their attention shifted to a different speaker, the volume levels changed to reflect that shift.

Encouraged by their results, the researchers are now investigating how to transform this prototype into a noninvasive device that can be placed externally on the scalp or around the ear. They also hope to further improve and refine the algorithm so that it can function in a broader range of environments.

"So far, we've only tested it in an indoor environment," said Dr. Mesgarani. "But we want to ensure that it can work just as well on a busy city street or a noisy restaurant, so that wherever wearers go, they can fully experience the world and people around them."

This research was supported by the National Institutes of Health (NIDCD-DC014279), the National Institute of Mental Health (R21MH114166), the Pew Charitable Trusts, the Pew Scholars Program in the Biomedical Sciences and Columbia Technology Ventures.

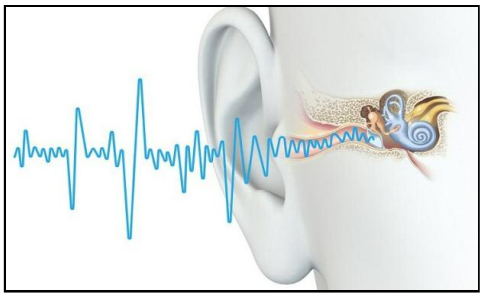
Story Source:

Materials provided by The Zuckerman Institute at Columbia University. Note: Content may be edited for style and length.

Discovery of inner ear function may improve diagnosis of hearing impairment

Results from a research study published in Nature Communications show how the inner ear processes speech, something that has until now been unknown. The authors of the report include researchers from Linköping University, Sweden, and Oregon Health & Science University, United States.

A collaboration between researchers in the U.S., Sweden, Denmark, the U.K. and India has now revealed how the inner ear processes speech. The discovery is an important addition to our understanding of how the inner ear and our sense of hearing function. The results have been presented in an article published in the scientific journal Nature Communications.



"The sound of speech has two components in the inner ear. One component consists of high frequency variations in the speech sound. The other component, known as the 'envelope', describes the outermost pattern of the speech sound," says Anders Fridberger, professor of neuroscience at Linköping University, and one of two principal authors of the article.

The envelope, which varies relatively slowly, can be considered as the overall structure of the speech signal. Researchers have previously shown that the envelope is most important for understanding what someone is saying. Until now, the way the inner ear decodes the envelope of the speech signals has remained elusive.

The inner ear produces tiny electrical currents whenever sound enters -- it converts sound to electrical impulses. These are led through the auditory nerve to the brain. By placing small electrodes into the ear canal of experimental subjects, and placing electrodes close to the cochlea of patients who have undergone surgery, the researchers have been able to record the way in which the inner ear codes speech-like sound.

"Our study shows how the inner ear separates out the slow, speech-important component for subsequent transfer to the brain," says Alfred Nuttall, professor of otolaryngology at Oregon Health & Science University and director of the Oregon Hearing Research Center.

The results have led the researchers to the understanding that speech gives rise to a particular form of electrical signals sent to the brain. These signals differ from those that arise in response to other forms of sound.

"It is remarkable that the coding of speech information relies on certain unique biophysical properties of the specialised inner ear cells that detect sound.," says Alfred Nuttall.

The discovery is an important addition to our understanding of how the inner ear functions. The inner ear is embedded in the thick bone of the skull, which makes it difficult to access and study it. Thus, diagnosing the exact location of damage to the inner ear is currently difficult.

"We believe that our results will improve diagnostic procedures for various hearing impairments, something that is sorely needed. Much remains to be done, however," says Anders Fridberger.

Story Source:

Materials provided by Linköping University. Note: Content may be edited for style and length.

AI - what's it all about?

by Margaret Rouse, Ed Burns and Nicole Laskowski

Artificial intelligence (AI) is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction.

At first glance at this page you would be forgiven for thinking you've mistakenly opened a computer buff's magazine, however we have included this item because we have highlighted in this issue developments where AI is being used in many items including hearing equipment and AI is going to be a part of our lives increaingly as time goes on.

Particular applications of AI include expert systems, speech recognition and machine vision.

AI can be categorized as either weak or strong. Weak AI, also known as narrow AI, is an AI system that is designed and trained for a particular task. Virtual personal assistants, such as Apple's Siri, are a form of weak AI.

Strong AI, also known as artificial general intelligence, is an AI system with generalized human cognitive abilities. When presented with an unfamiliar task, a strong AI system is able to find a solution without human intervention.

Because hardware, software and staffing costs for AI can be expensive, many vendors are including AI components in their standard offerings, as well as access to Artificial Intelligence as a Service (AIaaS) platforms.

AI as a Service allows individuals and companies to experiment with AI for various business purposes and sample multiple platforms before making a commitment. Popular AI cloud offerings include Amazon AI services, IBM Watson Assistant, Microsoft Cognitive Services and Google AI services.

While AI tools present a range of new functionality for businesses, the use of artificial intelligence raises ethical questions. This is because deep learning algorithms, which underpin many of the most advanced AI tools, are only as smart as the data they are given in training. Because a human selects what data should be used for training an AI program, the potential for human bias is inherent and must be monitored closely.

Some industry experts believe that the term artificial intelligence is too closely linked to popular culture, causing the general public to have unrealistic fears about artificial intelligence and improbable expectations about how it will change the workplace and life in general. Researchers and marketers hope the label augmented intelligence, which has a more neutral connotation, will help people understand

that AI will simply improve products and services, not replace the humans that use them.

Types of artificial intelligence

Arend Hintze, an assistant professor of integrative biology and computer science and engineering at Michigan State University, categorizes AI into four types, from the kind of AI systems that exist today to sentient systems, which do not yet exist. His categories are as follows:

• *Type 1: Reactive machines.*

An example is Deep Blue, the IBM chess program that beat Garry Kasparov in the 1990s. Deep Blue can identify pieces on the chess board and make predictions, but it has no memory and cannot use past experiences to inform future ones. It analyzes possible moves -- its own and its opponent -- and chooses the most strategic move. Deep Blue and Google's AlphaGO were designed for narrow purposes and cannot easily be applied to another situation.

• *Type 2: Limited memory.*

These AI systems can use past experiences to inform future decisions. Some of the decision-making functions in self-driving cars are designed this way. Observations inform actions happening in the not-so-distant future, such as a car changing lanes. These observations are not stored permanently.

• *Type 3: Theory of mind.*

This psychology term refers to the understanding that others have their own beliefs, desires and intentions that impact the decisions they make. This kind of AI does not yet exist.

• *Type 4: Self-awareness.*

In this category, AI systems have a sense of self, have consciousness. Machines with self-awareness understand their current state and can use the information to infer what others are feeling. This type of AI does not yet exist.

Examples of AI technology

AI is incorporated into a variety of different types of technology. Here are seven examples.

• Automation: What makes a system or process function automatically. For example, robotic process automation (RPA) can be programmed to perform high-volume, repeatable tasks that humans normally performed. RPA is different from IT automation in that it can adapt to changing circumstances.

• Machine learning: The science of getting a computer to act without programming . Deeplearning is a subset of machine learning that, in very simple terms, can be thought of as the automation of predictive analytics.

There are three types of machine learning algorithms:

• *Supervised learning:*

Data sets are labeled so that patterns can be detected and used to label new data sets

• *Unsupervised learning:*

Data sets aren't labeled and are sorted according to similarities or differences

• *Reinforcement learning:*

Data sets aren't labeled but, after performing an action or several actions, the AI system is given feedback

• *Machine vision:*

The science of allowing computers to see. This technology captures and analyzes visual information using a camera, analog-to-digital conversion and digital signal processing. It is often compared to human eyesight, but machine vision isn't bound by biology and can be programmed to see through walls, for example. It is used in a range of applications from signature identification to medical image analysis. Computer vision, which is focused on

machine-based image processing, is often conflated with machine vision.

• *Natural language processing (NLP):*

The processing of human -- and not computer -- language by a computer program. One of the older and best known examples of NLP is spam detection, which looks at the subject line and the text of an email and decides if it's junk. Current approaches to NLP are based on machine learning. NLP tasks include text translation, sentiment analysis and speech recognition.

• *Robotics:*

A field of engineering focused on the design and manufacturing of robots. Robots are often used to perform tasks that are difficult for humans to perform or perform consistently. They are used in assembly lines for car production or by NASA to move large objects in space. Researchers are also using machine learning to build robots that can interact in social settings.

• *Self-driving cars:*

These use a combination of computer vision, image recognition and deep learning to build automated skill at piloting a vehicle while staying in a given lane and avoiding unexpected obstructions, such as pedestrians.*(Thank goodness! Ed)*

AI applications

Artificial intelligence has made its way into a number of areas. Here are six examples.

• *AI in healthcare.*

The biggest bets are on improving patient outcomes and reducing costs. Companies are applying machine learning to make better and faster diagnoses than humans. One of the best known healthcare technologies is IBM Watson. It understands natural language and is capable of responding to questions asked of it. The system mines patient data and other available data sources to form a hypothesis, which it then presents with a confidence scoring schema. Other AI applications include chatbots, a computer program used online to answer questions and assist customers, to help schedule follow-up appointments or aid patients through the billing process, and virtual health assistants that provide basic medical feedback.

• *AI in business.*

Robotic process automation is being applied to highly repetitive tasks normally performed by humans. Machine learning algorithms are being integrated into analytics and CRM platforms to uncover information on how to better serve customers. Chatbots have been incorporated into websites to provide immediate service to customers. Automation of job positions has also become a talking point among academics and IT analysts.

• *AI in education.*

AI can automate grading, giving educators more time. AI can assess students and adapt to their needs, helping them work at their own pace. AI tutors can provide additional support to students, ensuring they stay on track. AI could change where and how students learn, perhaps even replacing some teachers.

• *AI in finance.*

AI in personal finance applications, such as Mint or Turbo Tax, is disrupting financial institutions. Applications such as these collect personal data and provide financial advice. Other programs, such as IBM Watson, have been applied to the process of buying a home. Today, software performs much of the trading on Wall Street and the Stock Exchange.

• AI in law.

The discovery process, sifting through of documents, in law is often overwhelming for humans. Automating this process is a more efficient use of time. Startups are also building question-and-answer computer assistants that can sift

programmed-to-answer questions by examining the taxonomy and ontology associated with a database.

• *AI in manufacturing.*

This is an area that has been at the forefront of incorporating robots into the workflow. Industrial robots used to perform single tasks and were separated from human workers, but as the technology advanced that changed.

Cochlear gets exclusive licence to AI assistant to improve cochlear implant fitting

Cochlear Limited (ASX: COH), the world leader in implantable hearing solutions, has entered into an exclusive licensing and development agreement with Otoconsult NV for its artificial intelligence fitting assistant FOX (Fitting to Outcomes eXpert).

This technology is expected to enable a faster and more consistent fitting of cochlear implants to deliver the best possible patient outcomes.

Unlike other fitting methods, FOX uses speech perception and other patient outcome tests as an input to its fitting optimization algorithm, in order to maximise outcomes for patients. Outcomes testing is conducted using the Auditory Speech Sounds Evaluation (ASSE) test suite, also developed by Otoconsult, which can be directly linked from the clinician's computer to the Cochlear speech processors using a proprietary link.

FOX then provides the additional opportunity to analyse the patient's test results and previous MAPs against other anonymised MAPs to provide its recommendation of the best possible MAP for that patient. Working in this way expedites the cochlear implant fitting process to take the measured results even closer to an ideal hearing target.

FOX is the only artificial intelligence fitting assistant using anonymised outcomes data and the results of other MAPs stored in its proprietary database. FOX will continually improve its predictive ability as each new MAP is created and performance data is added to its database.

"FOX's artificial intelligence assistant will provide clinicians – no matter where they are in the world – a platform to speed up the cochlear implant fitting process while also helping them achieve the best possible patient outcome," said Cochlear CEO and President, Chris Smith. "Partnering with Otoconsult, we hope to strengthen our technology offering to clinical care professionals, giving them greater consistency of outcomes with this cutting-edge solution."

"The FOX technology will change how we program cochlear implants," said William H. Shapiro, AuD, CCC-A, Clinical Associate Professor in Otolaryngology and Supervising Audiologist, NYU Cochlear Implant Center, NYU School of Medicine, New York, NY. "The audiologist can perform a set of simple, yet critical tasks, where the patient is an active participant, to provide the evidence for target-based fitting much like hearing aid verifications today. Additionally, it allows the clinician to take the patient out of the audiometric booth providing a better patient experience."

Under the terms of the agreement, Cochlear will licence FOX and a proprietary

link to the ASSE performance testing suite exclusively over a five-year period. During that time the services of Otoconsult and its founder, Dr. Paul Govaerts, will be retained to further develop and enhance the application with Cochlear technologies.

ABOUT OTOCONSULT NV

Otoconsult NV is a software and consultancy company focused on developing ground-breaking solutions for professionals in the field of audiology, otorhinolaryngology and acoustics. Otoconsult is based in Antwerp, Belgium, and is a subsidiary of the Eargroup, which is majority-owned by its founder, Professor and Dr. Paul Govaerts, an Ear, Nose and Throat Specialist and Audiologist. Dr. Govaerts has been a continuous innovator of clinical solutions and automation in the cochlear implant industry for more than 20 years.

ABOUT COCHLEAR LIMITED (ASX: COH)

Cochlear is the global leader in implantable hearing solutions. The company has a global workforce of 3,000 people and invests more than AUS$100 million a year in research and development. Products include hearing systems for cochlear, bone conduction and acoustic implants. Over 450,000 people of all ages, across more than 100 countries, now hear because of Cochlear.

People 'hear' flashes due to disinhibited flow of signals around the brain, suggests study

Study sheds light on why some people hear the 'skipping pylon' and other 'noisy GIFs'

A synaesthesia-like effect in which people 'hear' silent flashes or movement, such as in popular 'noisy GIFs' and memes, could be due to a reduction of inhibition of signals that travel between visual and auditory areas of the brain, according to a new study. It was also found that musicians taking part in the study were significantly more likely to report experiencing visual ear than non-musician participants.

A synaesthesia-like effect in which people 'hear' silent flashes or movement, such as in popular 'noisy GIFs' and memes, could be due to a reduction of inhibition of signals that travel between visual and auditory areas of the brain, according to a new study led by researchers at City, University of London.

The study is the first to provide insight into the brain mechanisms underpinning such auditory sensations also known as a 'visually-evoked auditory response' (aka vEAR or 'visual ear').

Whilst one theory is that areas of the brain responsible for visual and auditory processing normally compete, this research suggests that they may actually cooperate in people who report visual ear.

It was also found that musicians taking part in the study were significantly more likely to report experiencing visual ear than non-musician participants. This could be because musical training may promote joint attention to both the sound of music and the sight of the coordinated movements of the conductor or other musicians.

Dr Elliot Freeman, Principal Investigator on the study and a Senior Lecturer in

Psychology at the University said: "We already knew that some people hear what they see. Car indicator lights, flashing neon shop signs, and people's movements as they walk may all trigger an auditory sensation.

"Our latest study reveals normally-occurring individual differences in how our senses of vision and hearing interact.

"We found that people with 'visual ears' can use both senses together to see and also 'hear' silent motion, while for others hearing is inhibited when watching such visual sequences."

Some neuroscientists believe visual-ear may be a type of synaesthesia, with other examples including music, letters or numbers that can evoke perceptions of colour. However, visual ear appears to be the most prevalent, with as many as 20% of people reporting some experiences of it compared to 4.4 per cent for other types.

The condition has received more attention due to the recent, viral popularity of the 'skipping pylon GIF', and other 'noisy GIFs' depicting silent motion, which in some people evoke very vivid visual ear sensations.

To shed light on what may be going on in the brain when people view such content, the researchers applied a weak alternating current to participants' scalps, using a technique called transcranial Alternating Current Stimulation (tACS), to explore how the visual and auditory parts of the brain interact in those who experience visual ear and those who don't.

The first experiment of the study included 36 healthy participants, including 16 classical musicians from the London Royal College of Music. All were shown auditory and visual 'Morse code' sequences, while electrical simulation (tACS) was applied to either the back of the head (visual areas of the brain) or the sides (auditory areas) using 'alpha-frequency' tACS stimulation. Participants were then classified as visual or non-visual ear depending on whether they reported 'hearing' the silent flashes.

The researchers found that in non-visual ear participants, alpha-frequency stimulation to auditory areas significantly reduced auditory performance but improved visual performance, while the opposite pattern was found for the same frequency of stimulation to visual areas (poorer vision, better audition).

This reciprocal pattern suggests a competitive interaction between visual and auditory brain areas with each normally inhibiting the performance of the other.

However these interactions were strikingly absent in visual ear participants, suggesting that their auditory and visual areas were not competing but cooperating with each other.

A second experiment was conducted to see whether even people without conscious awareness of 'visual ear' sometimes use their auditory brain areas to make purely visual judgements. It found that this might indeed be the case for some, where stimulation to auditory areas of the brain affected accuracy of visual judgements almost as much as stimulating visual areas.

Taken together, the results of these experiments support a popular theory that some kinds of synaesthesia may depend on a disinhibition of pre-existing neural cross-connections between sensory brain areas that are normally inactive. When these connections are disinhibited this may result in conscious awareness of visual ear and other synaesthetic phenomena.

Dr Freeman said: "We were also interested to find that, on average, participants with visual ear performed better on both visual and auditory tasks than those without. Perhaps their audio-visual cooperation benefits performance because more of the brain is engaged in processing visual stimuli.

"Such cooperation might also benefit musical performance, explaining why so many of the musicians we tested reported experiencing visual ear."

Story Source:

Materials provided by City University London. Note: Content may be edited for style and length.

Italian Orchard meet up

The first event of the year after the AGM saw us meet up for a meal at one of our favourite restaurants

Set in the countryside with a really nice exterior

and a good time was had by all.

Caroline came all the way from Carlisle and knew whose turn it was to get the wine!

MED-EL NEWS

MED-EL Hearing Implant Information Day – 9th March 2019

MED-EL recently held their first hearing implant information day for candidate and users of both cochlear implants and bone conduction systems.

The day included something for everyone with interactive workshops, including Music and the Deaf, and connectivity, rehabilitation and support from MED-EL.

HearPeers Mentors were on hand to support delegates with all their questions about life with an implant and gave presentations on their own hearing journeys and helpful tips. The day was a huge success with everyone commenting on how informative the day had been and how useful it was to speak to people who have had the experience of receiving a hearing implant. The following feedback was also received from one of the attendees -

"The hearing implant information day run by MED-EL was really informative. Being an implant user myself and working with deaf children who are implant users, it is really important for me to keep up to date with the latest technology and gadgets."

"Hearing the stories shared by HearPeer Mentors has made me realise I want to share my story and help others. I have applied to be a mentor."

"Listening to Danny from Music and the Deaf share his musical experiences was really inspiring and made me go away to research more".

"Overall, just getting together and meeting other implant users was really refreshing. The day helped me to understand the clever technology that we are so lucky to have. I'm looking forward to the next day already."

An annual programme of information days will be rolled out soon. To find out more including future dates and locations email conferences@medel.co.uk

True Gold Standard in MRI

What is an MRI and why is it important?

Magnetic Resonance Imaging (MRI) is used to help consultants diagnose and plan treatment for a wide range of illnesses and injuries. Scanning uses a strong magnetic field, which can interact with implanted medical devices, especially those containing a magnet such as a cochlear implant. For some cochlear implant types even at 1.5 Tesla, this can cause unwanted side effects such as pain and discomfort, or even the magnet detaching from the implant requiring further surgery.

However, MED-EL users already benefit from all generations of MED-EL cochlear implants having been shown to be safe and effective, with few side effects, during MRI procedures, and

we further enhance this with our SNYCHRONY System.

MRI and MED-EL

The revolutionary magnet design available in MED-EL's SYNCHRONY implant means that cochlear implant users can undergo high resolution MR scans of up to 3.0 Tesla* without the need for the magnet to be surgically removed beforehand and later replaced. You simply remove your audio processor for the scan and replace it after leaving the scanning room. It does not matter whether you're having a 3 Tesla MRI or one at a lower field strength, there's no need for local anaesthesia, head bandaging, or head splints before a scan. This means:

- No need for invasive surgery
- No hearing downtime
- No lengthy waits for the MR scan
- No discomfort during the MR scan

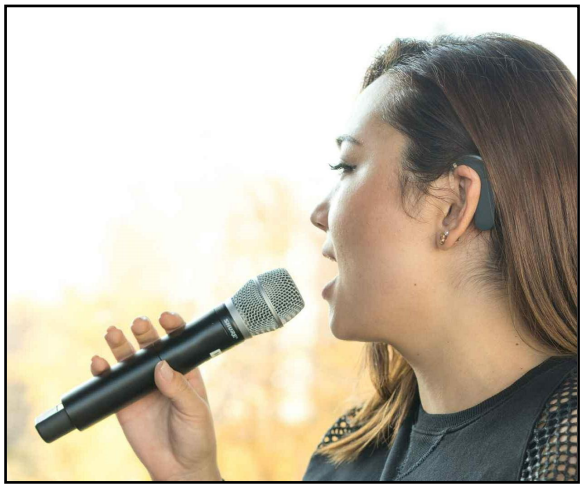
*Only certain field-strengths are allowed. See www.medel.com/important-safety-information for more information.

For information about MRI and cochlear implants, visit www.medel.com

MED-EL Music Grant – Now includes singing lessons

Have you ever wanted to learn how to play an instrument or take up singing lessons?

The MED-EL Music Grant provides implant users with an amazing opportunity to follow their musical dreams, irrelevant of previous experience.



Whether they're beginning their musical journey or already an accomplished musician, MED-EL wants to encourage implant users to reach for the stars, whether it's becoming a rock star or simply improve their auditory listening skills. MED-EL are behind them with support every step of the way.

Music plays an important role in many people's lives, it enables us to relax from everyday life, empathise with lyrics, and it can be an excellent form of socialising.

If you have a MED-EL implant or you have a child with an implant and would like to apply for the Music Grant 2019 please apply on the link below which can also be found on our website along with all the terms and conditions.

www.medel.com/uk/musicgrant/

Need more information?

One applicant will be chosen from each of the following age groups: under 19's and over 19's – no age limits whatsoever!

Winners will receive:

- A musical instrument of their choice up to the value of £500 (not applicable for singing lessons)
- One 30-minute lesson (instrument or singing) per week for one year which will commence in September
- A £30 allowance for sheet music

What are you waiting for?

The deadline for applications is 29th July each year and winners will be announced by 16th August.

Applicants under the age of 18 years must have the consent of their parent or legal guardian.

Google Accessibility project

A day after Microsoft used its Build 2019 developer conference to talk about AI and accessibility, Google is doing the same at its I/O 2019 developer conference. The Mountain View company unveiled three separate efforts: Project Euphonia (to help people with speech impairments), Live Relay (to help people who are deaf or hard of hearing), and Project Diva (to give people some independence and autonomy via Google Assistant)

In the last issue of Resound we reported on two new Apps from Google, Live Transcribe and Sound Amplifier which were in late development or about to be released.

Following on from that Google have released details of new projects to help people communicate with others.

Google cited a few numbers from the World Health Organization to back its efforts. Over 1 billion people, or 15% of the population, live with some sort of disability. That number is expected to rise as people get older and live longer.

Google has an accessibility sandbox at I/O 2019 where attendees will be able to try out these research products. Whether you're at I/O or not, however, you'll still want to read on and watch the videos. But first, grab a tissue.

Project Euphonia

Project Euphonia, which is in the early research stages, aims to help people with speech impairments communicate more easily. Speech impairments can be caused by developmental disorders such as cerebral palsy and autism, or neurologic conditions such as stroke, ALS (amyotrophic lateral sclerosis), MS (multiple sclerosis), TBI (traumatic brain injuries), and Parkinson's.

With Project Euphonia, Google is hoping AI can improve computers' ability to understand impaired speech, and in turn, computers can help ensure everyone is understood.

The Project Euphonia team is part of Google's AI for Social Good program.

The team partnered with the nonprofit organizations ALS Therapy Development Institute (ALS TDI) and ALS Residence Initiative (ALSRI) to record the voices of people who have ALS. By learning about the communication needs of people with ALS, the team was able to work on optimizing AI-based algorithms to more reliably recognize and transcribe the words they say.

On an ongoing basis, Google is collecting slurred (dysarthric) speech from individuals who have ALS, and turning their recorded voice samples into a spectrogram. The team is then using correctly transcribed spectrograms to train its AI system to better recognize this type of speech.

The models are currently limited — they only work for individuals who speak English and have impairments typically associated with ALS. Google does, however, believe the research can be subsequently applied to larger groups of people and to different speech impairments.

The AI tools that provide these improvements to speech recognition are only possible with speech samples. The more speech samples to train the models on, the greater the potential to understand more people. Google is also training personalized AI algorithms to detect sounds

or gestures, and take actions such as generating spoken commands to Google Home or sending text messages.

Google is talking about this project at the conference because it needs more samples

Live Relay

by Sapir Caduri

Software Engineer and Live Relay Developer

Published May 7, 2019

Last year, I read a social media post from a young woman in Israel. She shared a story about a guy she was in a relationship with, who was deaf, struggling to fix the internet connection at their home. The internet service provider's tech support had no way to communicate with him via text, email or chat, even though they knew he was deaf. She wrote about how important it was for him to feel independent and be empowered.

This got me thinking: How can we help people make and receive phone calls without having to speak or hear? This led to the creation of our research project, Live Relay.

Live Relay uses on-device speech recognition and text-to-speech conversion to allow the phone to listen and speak on the users' behalf while they type. By offering instant responses and predictive writing suggestions, Smart Reply and Smart Compose help make typing fast enough to hold a synchronous phone call.

Live Relay is running entirely on the device, keeping calls private. Because Live Relay is interacting with the other side via a regular phone call (no data required), the other side can even be a landline.

Of course, Live Relay would be helpful to anyone who can't speak or hear during a call, and it may be particularly helpful to deaf and hard-of-hearing users, complementing existing solutions. In the U.S., for example, there are relay and real-time text (RTT) services available for the deaf and hard-of-hearing. These offer advantages in some situations, and our goal isn't to replace these systems. Rather, we mean to complement them with Live Relay as an additional option for the contexts where it can help most, like handling an incoming call or when the user prefers a fully automated system for privacy consideration.

We're even more excited for Live Relay in the long term because we believe it can help all of our users. How many times have you gotten an important call but been unable to step out and chat? With Live Relay, you would be able to take that call anywhere, anytime with the option to type instead of talk. We are also exploring the integration of real-time translation capability, so that you could potentially call anyone in the world and communicate regardless of language barriers. This is the power of designing for accessibility first.

Live Relay is still in the research phase, but we look forward to the day it can give our users more and better ways to communicate—especially those who may be underserved by the options available today.

Follow @googleaccess on twitter for continued updates, and contact the Disability Support team (g.co/disabilitysupport) with any feedback.

Visit to the Walker Art Gallery in Liverpool

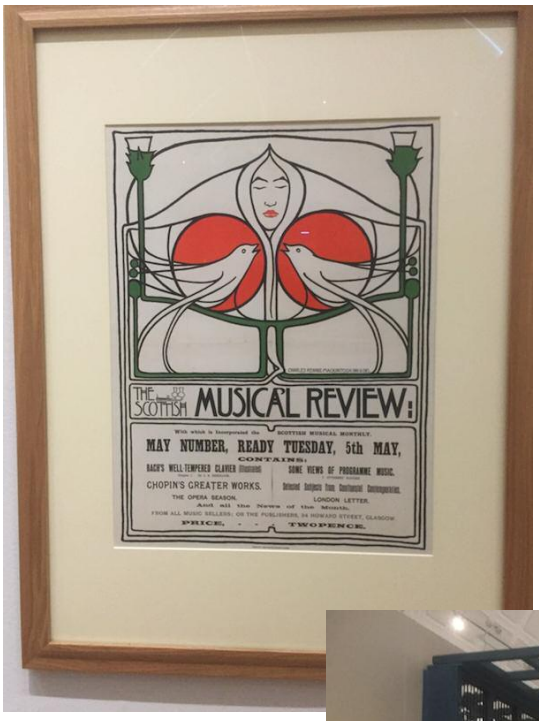
The impressive Walker Art Gallery in Liverpool was the venue for our next event of the year and we met in late May to visit the Charles Rennie Mackintosh Exhibition being held there.
The main gallery houses many pictures from different ages and has a permanent display, however our exhibition was held in a special area of the gallery for travelling 'shows'

As usual when we go to events in this part of Liverpool we met first at the cafe at St Georges hall where a private room had been booked for our party. It was a good opportunity for a chat as well as something to eat.

Pausing just long enough next to one of many Victorian statues outside St Georges hall we made our way a short distance to the Walker Gallery

There were many items to look at all connected to the Glasgow School of Art ranging from design work for many famous buildings to stylish furniture and artwork both paintings and textiles. There was such a wide range of work that it took some time to view it all.

More snaps from the Mackintosh Exhibition courtesy of John Crooks



Notes for the diary

Upcoming events:

Jodrell Bank Tour	June 21st
Quarry Bank Mill	July 27th
Visit to Buxton	August 23rd

Full details will be sent out shortly to everyone and any updates can be found on the website at:
www.manchestercicada.org.uk/events-2019

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