

Charlotte Garcia

Email: Charlotte.Garcia@mrc-cbu.cam.ac.uk

Website: www.charlottegarcia.co.uk

Citizenship: British | American



Education

- 2022 **PhD in Cognitive Neuroscience**
MRC Cognition & Brain Sciences Unit, University of Cambridge
Thesis: The Panoramic ECAP Method: estimating patient-specific patterns of current spread and neural health in cochlear-implant users
Supervisors: Robert P Carlyon, Manohar Bance, Richard Turner
- 2015 **Bachelor of Science in Biomedical Engineering**
McCormick School of Engineering, Northwestern University
- 2015 **Bachelor of Arts in Music Theory and Cognition**
Bienen School of Music, Northwestern University

Positions

- Mar 2026 – **Assistant Research Professor** | Cambridge, UK
present MRC Cognition & Brain Sciences Unit, University of Cambridge
- Sep 2022 – **Research Associate** in Bob Carlyon’s Lab | Cambridge, UK
Feb 2026 MRC Cognition & Brain Sciences Unit, University of Cambridge
- May 2024 – **College Research Associate** | Cambridge, UK
present Wolfson College, University of Cambridge
- Oct 2023 – **Visiting Research Fellow** in Julie Arenberg’s Lab | Boston, USA
Dec 2023 Massachusetts Eye & Ear, Harvard University
- Oct 2015 – **Senior Engineer / Engineer II** | Round Lake, IL, USA
Aug 2018 Containers Manufacturing Engineering | Baxter Healthcare International
- Mar 2015 – **Auditory Cognition Engineer** | Chicago, IL, USA
Oct 2015 Resonance Medical LLC

Grants / Awards

- Dec 2025 NA **Research Culture and Equality, Diversity and Inclusion Award**
“Outstanding Contributions to EDI in the Workplace” ([Cambridge](#))
- Mar 2026 – £224,992 **RNID – Dunhill Medical Trust Fellowship**
Mar 2029 Patient-specific electrophysiological and psychophysical characterisation of cochlear-implant hearing for enhancement of pitch perception
- Jul 2025 – £10,000 **Royal National Institute for Deaf People (RNID) Innovation Seed Fund**
Jun 2026 *Co-Lead: Dorothee Arzounian* | Toward Accelerated and More Accurate Objective Fitting: Integrating Multi-Latency Measures of Auditory Processing in Cochlear Implant Patients
- Jan 2024 – £49,909 **Medical Research Council (MRC) Impact Acceleration Award**
Dec 2026 Precision Medicine for Cochlear Implant Healthcare: Translating the Panoramic ECAP Method from Laboratory to Clinic
- Jun 2024 €200 **Virtual Conference on Computational Audiology Video Pitch Award**
Translating the Panoramic ECAP Method to Clinic ([YouTube Link](#))

- Oct 2023 – £24,095 **Centre for Neuroscience Discovery (CIND) Early Career Award**
 Aug 2024 Personalizing Cochlear Implant Healthcare: translating the Panoramic ECAP Method from laboratory to clinic
- 2023 £1,000 **Graham Fraser Travel Grant (British Cochlear Implant Group)**
 Supported visiting fellowship to Mass Eye & Ear, Boston, USA
- 2018 – 2022 £42,650 **WD Armstrong Fund** | PhD Studentship, engineering applied to medicine
- 2018 – 2021 £70,000 **The Cambridge Trust** | part-cost PhD Studentship
- 2019 £5,000 **AIM-Day Hearing & Acoustics Grant**
 Alan Archer-Boyd, Matt Davis, **Charlotte Garcia**, Bradford Backus
 The Silent Stream: Using Internet of Things technology to reduce background music levels in public spaces for hearing device users

Teaching

- 2026 **Academic Article Journal Club**
 Seminar Series, MPhil in Translating Medical Device & Advanced Therapy Research
 Department of Clinical Neurosciences, University of Cambridge
- 2024 - **Basic Mechanisms of Auditory Perception, Acoustically and with Cochlear Implants**
present Lecture, *Cognition and the Brain* | MPhil in Cognitive Neuroscience
 MRC Cognition & Brain Sciences Unit, University of Cambridge
- 2024 **Objective Measures in Cochlear Implants**
 Lecture, *Advances in Auditory Implants Masterclass* | MPhil in Audiology
 The Ear Institute, University College London
- Jul – Sep **Undergraduate Internship, Extended Analysis for the Panoramic ECAP Method**
 2023 Supervision, *Cambridge Math Placements Programme* | University of Cambridge
- 2017 – 2018 **Multivariate Data Analysis for Real-Time Manufacturing Process Control**
 Developed and Delivered four-day training course for Quality Engineers
 Cuernavaca Mexico, Guangzhou China, Sabiñánigo Spain, Grosotto Italy, Round
 Lake IL USA, Mountain Home AR USA, North Cove NC USA | Baxter Healthcare
- 2017 – 2018 **Multivariate Data Analysis for Real-Time Manufacturing Process Control**
 Developed two online training courses for Quality Engineers & Machine Operators
 Virtual | Baxter Healthcare

Book Chapters

- 2026 **Garcia, C.** (2026). Electrically Evoked Compound Action Potentials (ECAPs). In: Molae-Ardekani, B., Segovia-Martinez, M. (eds), *Advancing Cochlear Implants*. Springer, Cham. doi: 10.1007/978-3-032-15719-5_7

Journal Publications

- 2026 *Borsetto, D., ***Garcia, C.**, ..., and Bance, M. (accepted, *Ear and Hearing*).
 Intraoperative Application of Stimulation Current Induced Non-Stimulating
 Electrode Voltages for Identifying Extra-cochlear Electrodes in Cochlear implants.
- Garcia, C.** (accepted, *Auditio*) An Online Implementation of the Panoramic ECAP
 Method for Estimating Patterns of Current Spread and Neural Responsiveness in
 Cochlear Implant Users.
- Lien, J. T. H., Strahl, S., **Garcia, C.**, Vickers, D. (2026). Repolarisation Speed May
 Vary with Characteristic Frequency in Human Spiral Ganglion Cells: Preliminary

Observation from Electrically Evoked Compound Action Potentials. medRxiv. doi: 10.64898/2026.04.23.26351590

- 2025 Salorio-Corbetto, M., Eitutis, S. T., Tam, Y. C., ... , **Garcia, C.**, Smith, M. E., & Bance, M. L. (2025). Effect of Taking a Break From Cochlear-Implant Use for Resolving Facial-Nerve Stimulation: A Case Series. *Otology & Neurotology*. **47**(2), e193-e200. doi: 10.1097/MAO.0000000000004698
- Garcia, C.**, Sismono, F., Goehring, T., Guérit, F., Arzounian, D., & Carlyon, R. P. (2025). A comparison of electrophysiological measures for characterizing the cochlear-implant electrode-neuron interface. *JASA Express Letters*. **5**, 082001. doi: 10.1121/10.0038746
- Arzounian, D., Guérit, F., Deeks, J.M., **Garcia, C.**, de Groote, E., Bance, M. and Carlyon, R.P. (2025). Measurement of phase-locked neural responses to cochlear-implant stimulation from multiple stages of the auditory system. *Hearing Research*. **464**, 109338. doi: 10.1016/j.heares.2025.109338
- Garcia, C.** and Carlyon, R.P. (2025). Assessing Array-Type Differences in Cochlear Implant Users Using the Panoramic ECAP Method. *Ear and Hearing*, **46**(5), 1355-1368. doi: 10.1097/AUD.0000000000001673
- Peng, T., **Garcia, C.**, Haneman, M., Shader, M., Carlyon, R.P. and McKay, C. (2025). Comparing patient-specific variations in intra-cochlea neural health estimated using psychophysical thresholds and panoramic electrically evoked compound action potentials (PECAPs). *Journal of the Association for Research in Otolaryngology*, **26**, 77-91. doi: 10.1007/s10162-024-00972-z
- 2024 **Garcia, C.**, Morse-Fortier, C., Guérit, F., Hislop, S., Goehring, T., Carlyon, R.P. and Arenberg, J.G. (2024). Investigating the effect of blurring and focusing current in cochlear implant users with the Panoramic ECAP Method. *Journal of the Association for Research in Otolaryngology*, **25**, 591–609. doi: 10.1007/s10162-024-00966-x
- 2023 de Rijk, S.R., Boys, A.J, Roberts, I.V., Jiang, C., **Garcia, C.**, Owens, R.M. and Bance, M. (2023). Tissue-Engineered Cochlear Fibrosis Model Links Complex Impedance to Fibrosis Formation for Cochlear Implant Patients. *Advanced Healthcare Materials*, **12**, 2300732. doi: 10.1002/adhm.202300732
- Garcia, C.**, Deeks, J.M., Goehring, T., Borsetto, D., Bance, M. and Carlyon, R.P. (2023). SpeedCAP: An Efficient Method for Estimating Neural Activation Patterns Using Electrically-Evoked Compound Action Potentials in Cochlear Implant Users. *Ear and Hearing*, **44**(3), 627-640. doi: 10.1097/AUD.0000000000001305
- 2022 **Garcia, C.** (2022). The Panoramic ECAP Method: estimating patient-specific patterns of current spread and neural health in cochlear implant users. *Dissertation*. University of Cambridge. doi: 10.17863/CAM.89113
- de Rijk, S.R., Hammond-Kenny, A., Tam, Y.C., Eitutis, S.T., **Garcia, C.**, Carlyon, R.P. and Bance, M. (2022). Detection of Extracochlear Electrodes Using Stimulation-Current-Induced Non-Stimulating Electrode Voltage Recordings with Different Electrode Designs. *Otology & Neurotology*, **43**(5), 548-557. doi: 10.1097/MAO.0000000000003512
- 2021 **Garcia, C.**, Goehring, T., Cosentino, S., Turner, R.E., Deeks, J.M., Brochier, T., Rughooputh, T., Bance, M. and Carlyon, R.P. (2021). The Panoramic ECAP Method: estimating patient-specific patterns of current spread and neural health in cochlear implant users. *Journal of the Association for Research in Otolaryngology*, **22**(5), 567-589. doi: 10.1007/s10162-021-00795-2

Brochier, T., Guérit, F., Deeks, J.M., **Garcia, C.**, Bance, M. and Carlyon, R.P. (2021). Evaluating and Comparing Behavioural and Electrophysiological Estimates of Neural Health in Cochlear Implant Users. *Journal of the Association for Research in Otolaryngology*, **22**(1), 67-80. doi: 10.1007/s10162-020-00773-0

Manuscripts in preparation

Garcia, C., Guérit, F., Arzounian, D. and Carlyon, R.P. (in prep).

Optimising ALFIES: the contribution of multiple distortion products, effect of starting phase and of alternating polarity on cortical responses to sustained high-rate amplitude-modulated stimulation in cochlear implants.

Garcia, C., Arzounian, D., Guérit, F. and Carlyon, R.P. (in prep).

ALFIES Roaming Free: recording cortical distortion products in cochlear implant users using the reverse telemetry and hardware of the device itself.

Clinical Research Translation



Oct 2024 **Panoramic ECAP Website** | Developed with CIND Award
Allows users (e.g. clinicians) to analyse PECAP data from cochlear implant patients
<https://panoramic-ecap.mrc-cbu.cam.ac.uk>

2021 – **Medical Research Scientist, HIDO Clinic**
2026 Emmeline Centre | Addenbrookes Hospital | Cambridge

International PECAP Collaborators

2021 - *present* Massachusetts Eye & Ear (Julie Arenberg) | Rinri Therapeutics / Nottingham University (Doug Hartley) | Cochlear Australia (Pam Dawson) | Bionics Institute (Colette McKay) | Zurich University Hospital (Flurin Pfiffner, Tobias Goehring) | BoysTown National Research Hospital (Adam Bosen) | Ear Science Institute Australia (Christo Bester) | Ohio State College of Medicine (Shuman He)

Invited Talks

- Jan 2026 Speed Science Forum, SHaPS | University College London (UCL)
Electrophysiological measures of auditory perception in cochlear-implant users from the auditory nerve to the cortex
- July 2025 Conference on Implantable Auditory Prostheses | Lake Tahoe CA USA
Characterising the Electrode-Neuron Interface using the Panoramic ECAP Method
- Feb 2025 Young Investigator Symposium: Cochlear Health after Cochlear Implants: Biomarkers, Therapeutics, and Outcomes | MidWinter Meeting, Association for Research of Otolaryngology | Orlando FL USA
Using the Panoramic ECAP Method to characterize current spread and neural responsiveness in cochlear implant users
- Oct 2024 Seminars in Hearing Research, Purdue University | West Lafayette Indiana USA
Electrophysiological measures of auditory perception in cochlear implant users from the electrode-neuron interface to the cortex
- Jul 2024 Ear Science Institute Australia | Perth Australia
The Panoramic ECAP Method: Characterizing patient-specific patterns of current spread and neural responsiveness in cochlear implants
- Dec 2023 Arenberg Lab, Eaton Peabody Laboratories, Massachusetts Eye & Ear | Boston USA
The Panoramic ECAP Method: Characterizing patient-specific patterns of current spread and neural responsiveness in cochlear implants

Conference Podium Presentations

- Dec 2026 *Oh what fun it is to change (ALFIE'S) polarity and phase*
Cambridge Hearing Group Christmas Symposium | Cambridge UK
- Nov 2024 *You're a Cubic one, Mr Alfie (Cubic and Quadratic Neural Distortion Responses with the ALFIES method with both EEG and reverse telemetry in cochlear implant users)*
Cambridge Hearing Group Christmas Symposium | Cambridge UK
- Jun 2024 *Translating the Panoramic ECAP Method to Clinic | Won 'Best Video Pitch' Award*
Virtual Conference on Computational Audiology (VCCA) | Virtual | [YouTube Link](#)
- Sep 2022 *Investigating Changes in Current Spread with Focused and Blurred Stimulation in Cochlear Implant Users using the Panoramic ECAP Method*
Ear and Hear (UK Acoustics Network) Meeting | Southampton UK
- Feb 2022 *BlurCAP: Investigating Changes in Current Spread with Focused and Blurred Stimulation in Cochlear Implant Users using the Panoramic ECAP Method*
MidWinter Meeting, Association for Research of Otolaryngology | Virtual
- Dec 2022 *How to identify some ingredients for a good Christmas: Hugging, good elf, and lots of currants (Estimating Current Spread using the Panoramic ECAP Method)*
Cambridge Hearing Group Christmas Symposium | Cambridge UK
- Dec 2021 *SpeedCAP: like PECAP but much faster, and sometimes in the operating theatre*
Cambridge Hearing Group Christmas Symposium | Cambridge UK
- Jun 2020 *The PECAP Method: electrode-neuron interface modelling in cochlear implant users*
Virtual Conference on Computational Audiology (VCCA) | Virtual | [Online Abstract](#)
- Dec 2019 *Estimating Neural Survival Using a New Version of the Panoramic ECAP Method*
Cambridge Hearing Group Christmas Symposium | Cambridge UK

Conference Posters

- Jan 2026 *Objective Measures of Loudness in Cochlear-Implant Hearing*
MidWinter Meeting, Association for Research of Otolaryngology | San Jose PR USA
- Feb 2025 *ALFIES unwrapped: recording cortical responses to sustained high-rate stimulation in cochlear implant users*
MidWinter Meeting, Association for Research of Otolaryngology | Orlando FL USA
- Sep 2024 *Probing discrepancies between perceived loudness and ECAPs along the electrode array in Cochlear Implant users*
Auditory Science Meeting (ASM) | Cambridge UK
- Jun 2024 *Assessing Array-Type differences in current spread in Cochlear Implant users using the Panoramic ECAP Method*
Hearing Across the Lifespan (HEAL) | Cernobbio Lago di Como Italy
- Apr 2024 *The Panoramic ECAP Method: from Lab to Clinic*
British Cochlear Implant Group (BCIG) Meeting | Gateshead / Newcastle UK
- Sep 2023 *Assessing Array-Type differences in current spread in Cochlear Implant users using the Panoramic ECAP Method*
Basic Auditory Science (UK Acoustics Network) Meeting | London UK

- Jul 2023 *Investigating current spread in cochlear implant users with the Panoramic ECAP Method | Assessing Array-Type differences in current spread in Cochlear Implant users using the Panoramic ECAP Method | Towards using cochlear implant electrodes to record cortical responses to sustained high-rate stimulation*
Conference for Implantable Auditory Prostheses (CIAP) | Lake Tahoe California USA
- Apr 2023 *Assessing Array-Type differences in current spread in Cochlear Implant users using the Panoramic ECAP Method | **Won ‘Best Poster Presentation’ Award***
British Cochlear Implant Group (BCIG) Meeting | Cambridge UK
- Feb 2023 *Investigating current spread in cochlear implants with the Panoramic ECAP Method*
MidWinter Meeting, Association for Research of Otolaryngology | Orlando FL USA
- Jun 2022 *BlurCAP: Investigating Changes in Current Spread with Focused and Blurred Stimulation in Cochlear Implant Users using the Panoramic ECAP Method*
Royal Society Meeting Realising the potential of cochlear implants | Nottingham UK
- Jul 2021 *SpeedCAP: A Method for Efficiently Measuring Multiple Electrically Evoked Compound Action Potentials for Clinical Applications | The Silent Stream: Removal of Background Music in Communication Settings Using Audio Streaming and an Adaptive Filter*
Conference for Implantable Auditory Prostheses (CIAP) | Virtual
- Jan 2020 *Estimating Neural Survival using a New Version of the Panoramic ECAP Method*
MidWinter Meeting, Association for Research of Otolaryngology | San Jose CA USA
- Sep 2019 *Estimating Neural Survival using a New Version of the Panoramic ECAP Method*
Basic Auditory Science (UK Acoustics Network) Meeting | London UK
- Jun 2019 *Estimating Neural Survival using a New Version of the Panoramic ECAP Method*
Improving Cochlear Implant Performance | Cambridge UK

Peer-Reviewing

The International Journal of Audiology (IJA), Ear and Hearing (Ear Hear), Hearing Research (Hear Res), Journal of the Acoustical Society of America (JASA), Nature Scientific Reports (Sci Rep), Institute for Electrical and Electronics Engineers (IEEE), Journal of Neuroscience (JNeurosci), Trends in Hearing (Trends)

Service

- Jan 2024 – present **Chair, Equality & Diversity Committee**
MRC Cognition & Brain Sciences Unit | University of Cambridge
Organised yearly Equality & Diversity events | Installed Automatic Captioning in the Lecture Theatre | Hosted seminar on ‘Colonised Minds: Narratives that Shape Psychology,’ Akira O’Connor, Book Author/ Senior Lecturer, University of St Andrews
- 2019 – present **Member, Equality & Diversity Committee**
MRC Cognition & Brain Sciences Unit | University of Cambridge
- 2019 - 2025 **Member, Equality Diversity and Inclusion Governance Group**
Clinical School | University of Cambridge
- 2024 – present **Equality Champion, Equality Champions’ Network**
Clinical School | University of Cambridge
- 2023 – 2024 **Admissions Support – Application Ranking | MPhil Cognitive Neuroscience**
MRC Cognition & Brain Sciences Unit | University of Cambridge
- Sep 2024 **Co-organised Auditory Science (ASM, UK Acoustics Network) Meeting**
St Catharine’s College | University of Cambridge

Public Engagement

- Mar 2024 **Presenter, 'Bionic Ears' | Science Night, MRC Cognition & Brain Sciences Unit**
Cambridge Science Festival | University of Cambridge
- Dec 2023 **Presenter, 'How Cochlear Implants Work'**
Cochlear Implant Volunteer Appreciation Day
MRC Cognition & Brain Sciences Unit | University of Cambridge
- 2019 – 2025 **Facilitator, Cochlear Implant User Socials**
MRC Cognition & Brain Sciences Unit | University of Cambridge
- 2019 – 2020 **BrainBus | Neuroscience Engagement Programme with local schools**
MRC Cognition & Brain Sciences Unit | University of Cambridge

Technical Expertise

Programming

MATLAB, Python, elementary C++, LaTeX, git

General Software

Office Suite, Adobe, Minitab, ProTools, SPSS, SIMCA, Docker, Logic, GPower

Cochlear-Implant Software

Cochlear: Custom Sound Pro, Custom Sound EP, NIC2, NIC4.1 NIC4.3

Advanced Bionics: Soundwave, BEDCS, Volta

MEDEL: Maestro, RIB2

EEG: Biosemi ActiView, specifically with custom hyper-rate (262kHz) system

General: specific expertise with reverse telemetry, clinical and research systems

Analysis (highlights)

nonlinear optimisation models (i.e. sequential quadratic programming), ANOVA, ANCOVA, linear mixed effects models, basic machine learning algorithms (python), Fourier analysis, group delay, extracting neural signals from electrical artefacts in electrophysiological data, principal components analysis, projection to latent structures of partial least squares, factorial designed experiments, gage R&R

General Research Skills

research with human research participants, programming cochlear implant direct stimulation experiments, reverse telemetry, electroencephalography, oscilloscopes, programming graphical user interfaces (GUIs) in MATLAB and python, auditory psychophysics

Languages

English (native), Spanish (intermediate), Italian (elementary), French (elementary)