Cecilia T. Herbert   April 2021

Personal information

Names and surname:	Cecilia Thomsett Herbert
Date of birth:	17th April 1991
Nationality:	Argentine
National Identity Document (DNI) No.:	36813124
Address:	Mendoza 3235, C1428DLE, C.A.B.A., Argentina
Mobile phone:	+5491159884083
Email:	herbertceci@gmail.com

Education

April 2016 to date – PhD Student in Biology in the Doctoral Program of the Physiology and Molecular Biology Department (DFMBC) at Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires (FCEyN, UBA). I work at the Dynamical Systems Lab, Physics Department, FCEyN, UBA & IFIBA, CONICET, Argentina.

Doctoral Thesis: Study on the neural coding of song production in oscine birds

PhD Advisor: Ana Amador, PhD. (anita@df.uba.ar)

Scholarship for doctoral studies granted by CONICET (Argentine National Scientific and Technical Research Council).

Expected graduation date: end of 2021 -start of 2022 (grant ends March 2022).

To put the lab's population neural model of birdsong production to the test, I recorded extracellularly from a cortical nucleus in freely behaving canaries while they sang, using tetrodes. I developed and taught the techniques for small animal surgery and microdrive and tetrode fabrication, which were not used in the lab prior. I performed spectrographic analysis on the audio signals, neural signal processing and spike sorting of the data using custom Matlab code. I am currently performing other time series analysis to correlate LFP signals with behaviour.

March 2009 to March 2016 – Undergraduate student of Biology at Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires (FCEyN, UBA), Argentina.

Master's degree in Biology with specialization in Animal Physiology and graduation thesis (Licenciatura).

Master Thesis (2015): An automatic method for the identification of significant motor instances in birdsong

Master Thesis advisor: Gabriel Mindlin, PhD.

Grade point average: 9.26 out of 10. Master Thesis passed successfully in March 2016.

Publications

Peer reviewed journals

1. Lassa Ortiz, J. N., Herbert, C. T., Mindlin, G. B., & Amador, A. **"Significant instances in motor gestures of different songbird species"**. Frontiers in Physics, 7, 142. (2019). https://doi.org/10.3389/fphy.2019.00142

2. Herbert, C. T., Boari, S., Mindlin, G. B., & Amador, A. **"Dynamical model for the neural activity of singing *Serinus canaria*"**. Chaos 30, 053134. (2020). https://doi.org/10.1063/1.5145093

Poster sessions

October 2020 – Interactive talk in English "Grouped single-unit activity in a cortical avian nucleus supports a population model of birdsong production in *Serinus canaria***"** (Cecilia T. Herbert, Santiago Boari, Gabriel B. Mindlin, Ana Amador) presented at the **Neuromatch Conference 3.0** held virtually.

October 2020 – Poster presenter "Grouped single-unit activity in a cortical avian nucleus supports a population model of birdsong production in *Serinus canaria***"** (Cecilia T. Herbert, Santiago Boari, Gabriel B. Mindlin, Ana Amador) presented at the XXXV annual congress of the Argentine Neuroscience Research Society (SAN) held virtually. Abstract to be published in the open access journal ASN Neuro.

October 2020 – Poster co-author "Testing neural models with the appropriate species" (Javier N. Lassa Ortiz, Cecilia T. Herbert, Santiago Boari, Gabriel B. Mindlin, Ana Amador) presented at the XXXV annual congress of the Argentine Neuroscience Research Society (SAN) held virtually. Abstract to be published in the open access journal ASN Neuro.

October 2019 – Poster presenter "Local field potential in cortical avian nucleus supports a circular model for birdsong production" (Cecilia T. Herbert, Santiago Boari, Gabriel B. Mindlin, Ana Amador) presented at the XXXIV annual congress of the Argentine Neuroscience Research Society (SAN) in Villa Carlos Paz, Córdoba, Argentina. Abstract to be published in the open access journal ASN Neuro.

October 2019 – Poster co-author "Significant instances in motor gestures of different songbird species" (Javier N. Lassa Ortiz, Cecilia T. Herbert, Gabriel B. Mindlin, Ana Amador presented at the XXXIV annual congress of the Argentine Research Neuroscience Society (SAN) in Villa Carlos Paz, Córdoba, Argentina. Abstract to be published in the open access journal ASN Neuro.

September 2017 – Poster presenter "HVC neural activity supports a circular model for birdsong production" (Cecilia T. Herbert, Santiago Boari, Mariano Belluscio, Gabriel B. Mindlin, Ana Amador) presented at the XXXII annual congress of the Argentine Neuroscience Research Society (SAN) in Mar del Plata, Buenos Aires, Argentina.

Teaching background

Master thesis supervision

June 2020 to April 2021 – Assistant supervisor to Fiamma Liz Leites for her licenciatura thesis (master thesis equivalent). Fiamma is a Biology student at FCEyN, UBA. Thesis topic: Study of auditory neural activity in a sensorimotor cortical nucleus in canaries. Main supervisor: Ana Amador.

Teaching assistant

March to December 2016 – Undergraduate Teaching Assistant position in the Physiology and Molecular Biology Department, FCEyN, UBA. *I assisted in laboratory practicals and seminars of the courses Neural System Physiology and Introduction to Molecular Physiology.*

Conference participation

October 2013 – Presented the work "Respuesta a la necesidad de desarrollar una nueva herramienta para enseñar cinética enzimática" (Response to the need to develop a new tool to teach enzyme kinetics) (Authors: Herbert, Cecilia T. y Pozner, Roberto G. Collaborators: Gassmann, Marisa y Meinardi, Elsa), at the Congress on University Teaching organized by Secretaría Académica of the UBA.

November 2012 – Presented the work "Desarrollo de entornos virtuales para mejorar la enseñanza de contenidos de Química Biológica. Los alumnos nos ayudan a decidir su implementación" (Development of virtual environments to enhance teaching Biological Chemistry content. Students help us decide its implementation) (Authors: Herbert, Cecilia T. y Pozner, Roberto G.), at the I Virtual Encounter about ICTs and Teaching at University Level UBATIC+ organized by Centro de Innovación en Tecnología y Pedagogía, CITEP dependent of the Subsecretaría de Innovación y Calidad Académica de la Secretaría de Asuntos Académicos de la UBA.

Training

2012 – seminar "Dificultades en el aprendizaje de Ciencias Naturales: un enfoque cognitivo desde la comunicación entre expertos y novatos" (Difficulties in learning Natural Sciences: a cognitive approach from the communication between experts and novices) organized by the CEFIEC Institute in Buenos Aires, Argentina.

Internships, collaborations, scholarships and awards

Postgraduate

September 2019 – Received a travel grant from the Physics Department, FCEyN, UBA to attend the XXXIV annual congress of the Argentine Neuroscience Research Society (SAN) in Villa Carlos Paz, Córdoba, Argentina.

June to July 2018 – Received a travel grant from Boehringer Ingelheim Fonds to travel to
and **Financial aid scholarship sponsored by IBRO International Brain Research Organization, NIH Grant for NS&B and Lola Ellis Robertson Endowed Scholarship to attend the course "Neural Systems and Behavior"** in Woods Hole, MA, USA.

April to July 2016 – Collaborated with Mariano Belluscio on tetrode and microdrive construction at the Systems Biology Group in the Bernardo Houssay Institute of Physiology and Biophysics, Buenos Aires, Argentina.

April 2016 to April 2021 – Received a doctoral grant from CONICET at the Dynamical Systems Laboratory, Physics Department, FCEN, UBA & IFIBA, CONICET.

Undergraduate

July to August 2014 – Received financial aid scholarship to participate in the Undergraduate Summer Research Program 2014 of the School of Life Sciences of École Polytechnique Fédérale de Lausanne (EPFL) in the Biorobotics Laboratory led by Prof. Auke Ijspeert in Lausanne, Switzerland. *I performed a biophysical analysis of the movement of domestic animals using tracking software on videos to aid design of biologically inspired quadruped robots. The program included seminars/workshops and a student symposium.*

December 2013 – Received the 2013 Academic Merit Award, Santander Río Universidades for having one of the three hundred highest GPAs amongst participating students in a group of argentine universities.

August 2012 to October 2013 – Intern under the supervision of Dr. Roberto G. Pozner in the Biological Chemistry Department, FCEyN, UBA. Project "The Use of ICT in University Education in the Natural and Exact Sciences" of the UBATIC program. *I adapted code in netlogo to develop a virtual laboratory practical about enzyme kinetics for the Biological Chemistry course at the FCEyN. I continue to update the code as it remains a valuable tool, especially during distance learning in the 2020 academic year.*
http://modelingcommons.org/browse/one_model/3842#model_tabs_browse_info

Postgraduate courses

March 2021 - "The Cajal Neurokit Course: extracellular electrophysiology acquisition" organised by The CAJAL Advanced Neuroscience Training Programme In partnership with Open Ephys & Open Ephys Production Site and directed by Dr. Alex Leighton, held virtually.

September to November 2020 - "Frugal Science BioE 271" given by Prof. Manu Prakash from Stanford University, virtually. I participated in three project teams to work on global challenges:

Global Epilepsy: Seize Your Care. We looked into frugalizing at-home EEG monitoring devices to shorten the time taken to run tests for epilepsy diagnosis, in an effort to close the epilepsy treatment gap. I put together an analysis of cost vs channel count of existing commercial devices.
https://www.notion.so/Global-Epilepsy-Care-d6f424578f3e4d0d8caf534d24a850f8

Frugal Learning Tools for Visually Impaired. We worked on reimagining different tools to aid education. I prototyped a microscopy peer community for tactile learners, using laser etching to develop tactile slides at different magnifications.
https://www.notion.so/Frugal-learning-technologies-for-the-Visually-Impaired-620f1eeae8d04729bbdc2d22c119b981

Bioacoustics: Hathi March. We worked on developing a frugal seismometer to reduce the negative impact of elephant-human interactions. I helped out by planning a spectrographic analysis pipeline.
https://www.notion.so/Hathi-March-Bioacoustic-Sensors-d828cb51cf8f4c5ca51b715001b7cf8c

August to November 2019 - "Laboratorio de Electrónica" (Electronics Laboratory) given by Prof. Miguel Larotonda (96 hours) in the Physics Dept., FCEyN, UBA, Argentina. Marks: 9 out of 10.

August to November 2018 – "Aprendizaje Automático" (Machine Learning) given by Prof. Agustín Gravano (64 hours) in the Computing Dept., FCEN, UBA. Marks: 8 out of 10.

June to July 2018 – "Neural Systems and Behavior" directed by Hans Hofmann, André Fenton and Jade Zee (585 hours) of the Marine Biological Laboratory affiliated to the University of Chicago, in Woods Hole, MA, USA. Passed successfully. *I was exposed to eight different animal systems and worked closely with four of them taught by leaders in each field. Guest lecturers gave us special talks on other topics and it was a great pleasure to talk with them and learn from their insights.*

August to October 2017 – "Seminario de Herramientas Avanzadas de Análisis Estadístico" (Seminar on Advanced tools in Statistical Analysis) given by Profs. Andrés Farall and Marina Valdora (54 hours) in the Mathematics Dept., FCEyN, UBA, Argentina. Marks: 8 out of 10.

May to July 2017 – "Ciencia de Datos con R: Fundamentos Estadísticos" (Data Science in R: Fundamentals) given by Profs. Mariela Sued and Ana Bianco (54 hours) in the Institute of Calculus, FCEyN, UBA. Marks: 10 out of 10.

August 2016 – "Neurociencia de Sistemas" (Systems Neuroscience) given by Prof. Rodrigo Quian Quiroga (30 hours) in the Physics Dept., FCEyN, UBA, Argentina. Marks: 10 out of 10.

February 2016 – "Modelización y simulación matemática de sistemas. Metodología para su implementación computacional. Aplicaciones a la física, a la biología y a las finanzas" (Systems modelling and mathematical simulation) given at the Latin American Complutense School (60 hours) in UBA, Argentina. Marks: 8 out of 10.

Professional networks

2020 to date – Co-founder of Talleres Open Source, speaker and organizer. *Our goal is to bring together our experiences, guided by the needs of the neuroscience research community in a series of workshops about open source tools to establish a collective construction of knowledge. I gave a workshop on Digital Fabrication (CAD Design for FDM Printing) using FreeCAD*.
YouTube: https://www.youtube.com/channel/UCz3w8tadwU5hGbH4RX1Gkzg
GitHub: https://github.com/talleresopensource

2020 to date – Contributor to Open Neuroscience, the user-driven database of Open Science projects related to Neuroscience (https://open-neuroscience.com/)

2020 to date – Participant in the red latinoamericana de tecnologías libres (reGOSH) and the Buenos Aires node of GOSH (Global Open Science Hardware)

2019 to date – Member of the Red de Estudiantes de Neurociencias (Neuroscience student network)

2016 to date – Member of the Sociedad Argentina de Investigación en Neurociencias (SAN, Argentine Society for Neuroscience Research)

Outreach

November 2020 – Live virtual talk for middle school Music students, "How sounds look" for St. Hilda's College,

Hurlingham, Bs.As, Argentina. Geared towards young musicians: they submitted clips playing piano, oboe, trombone and clarinet which we explored together.

October 2020 – Live talk at virtual Science Plaza, "How sounds look" in representation of DFBMC, FCEyN, UBA for the 9th Municipal Science and Technology Show of La Matanza. Adapted for the general public, who were able to participate live via Zoom.

August 2020 – Live virtual talk for high school Biology students, "How sounds look" for St. Hilda's College, Hurlingham, Bs.As, Argentina. Geared towards bioacoustics: bird, bat, primate and mouse sounds, with an emphasis in behavioral and experimental neuroscience.

August 2020 – Content creator for Virtual Biology Week, video talk "How sounds look" of the DFBMC, FCEyN, UBA (https://www.youtube.com/watch?v=DBgzqF93tIw&t=7s) and spectrogram challenge as an Instagram activity. I adapted the material from the previous year to focus only on spectrographic analysis, presenting the spectrogram challenge and a tool people can use at home to explore sound.

August 2019 – Exhibit creator and co-ordinator at Biology Week "Tuning into the melodies of the nervous system" exhibit of the DFBMC, FCEyN, UBA. A two-day event for high-school students. I developed activities and infographics to bring the work we do in the lab to the students. We performed spectrographic analyses of attendees' voices in real time so they could understand how sound based behaviour can be studied, and we measured EMG activity while they moved their fingers so they could grasp how electric activity from the nervous system controls motor output. We described how we apply similar tools in the lab to study birdsong motor control, showed them raw data recordings and discussed results and implications.

August 2015 & August 2016 – Exhibitor at Biology Week, "A world of sensations" exhibit of the DFBMC, FCEyN, UBA. A three-day event for high-school students. They get a chance to see what is taught in the faculty and to discover fun, interesting topics. We showed perception modalities in different species, including a live electric fish.

November 2013, October 2015 & October 2016 – Exhibitor at Museum Night, "Learning like animals" exhibit of the DFBMC, FCEyN, UBA. A one-night event for the general public to get acquainted with the faculty, learn some science and talk with scientists about their research. We talked about how one can study learning and memory using animal models - featuring a live bee to explain the proboscis extension reflex!

June 2016 – Talk for high school students, "A path in science" at St. Hilda's College, Hurlingham, Bs.As, Argentina. As an alumna of the same school, I spoke about what studying for a graduate degree in Biology is like at the University of Buenos Aires and explained what I was researching during my PhD as an example of a prospective career path.

Skills

Languages

Spanish – Mother tongue. Further education in courses held at Linguistic Services S.A.

English – Bilingual. I attended a bilingual high school and part of my family is English. Advanced International Certificate of Education with Distinction, International Certificate of Education with Distinction.

French – Conversational. Diplôme d'Études en Langue Français A2, Diplôme d'Études en Langue Français A1.

Programming

Matlab, Python, C, R, NetLogo – Learnt by working on specific projects during courses and internships.

Non-scientific background

December 2018 to date – Principal oboe with the San Isidro Municipal Symphonic Orchestra.

March 2009 to March 2021 – Principal oboe with the Hurlingham Municipal Symphonic Orchestra and soloist performances. Outreach during 2020 about the instrument.

January 2009 to March 2016 – Head of Quality Department and Internal Auditor at Linguistic Services SA, a company specialized in English to Spanish translation. *Our department led the company to successfully update and renew its ISO 9001:2008 and EN 15038:2006 certified Quality Management System every year. I trained as an auditor in TÜV Rheinland Argentina.*