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Workplaces

January 31, 2021

CERCo
CENTRE DE RECHERCHE CERVEAU ET COGNITION, CNRS UMR5549
HÔPITAL PURPAN, PAVILLON BAUDOT, OFFICE 222
31300 TOULOUSE, FRANCE

and

ENAC
ECOLE NATIONALE DE L'AVIATION CIVILE
7 AVENUE EDOUARD BELIN, BÂT Z, OFFICE Z36
31400 TOULOUSE, FRANCE

Short presentation

My PhD project is held between the CerCo, CNRS unit at Purpan Hospital (supervisor: E. Barbeau), and the National School of Civil Aviation (supervisor: C. Hurter). The interaction between these two major French research institutes, one in Neurosciences and the other in Engineering and Aeronautics, allows the pooling of ideas and techniques at the forefront of each domain. My work is also very much integrated within the clinical team of Epilepsy Department of CHU Purpan and is based on exchanges with neurologists and other members of the medical team. I am developing front-end and back-end aspects of new technological tools for EEG visualization and automatic detection of (intra)cerebral specific oscillatory activities, using deep learning. Teaching at University and other types of scientific communication are also integral part of my activities.

Education

2018 to 2021 - **PhD., Neurosciences**

University Paul Sabatier
Toulouse, France

- Automatic detection of intracerebral pathological activities in epilepsy, multi-scaled big-data using artificial neural networks
- Supervisors: Barbeau E.J., Hurter C.

2015 to 2017 - **MSc., Clinical Neurosciences**

University Paul Sabatier
Toulouse, France

- Specialization (M1): Neurobiology
- Specialization (M2): Neuropsychology

2012 to 2015 - **BSc., Motor sciences - kinesiology**

University of Pau
Toulouse, France

- Sporting, motor functions and human movement sciences (STAPS in French)

Research Experience

2018 to 2021 - **PhD. Student, Neurosciences**

University Paul Sabatier

Toulouse, France

- Visualization and exploration of big data in the study of single neurons in epilepsy

2017 to 2018 - **Research Engineer**

CerCo and ENAC

Toulouse, France

- Neurosciences, Alzheimer's disease, epilepsy, data analysis, machine learning

2016 to 2017 - **MSc. student & Research assistant**

CerCo and ENAC

Toulouse, France

- Master 2 internship followed by a temporary research assistant contract

Publications

A meta-analysis of semantic memory in prodromal Alzheimer's Disease.

- Joubert S., **Gardy L.**, Didic M., Barbeau E.J.
- Full paper accepted in Neuropsychology Review (2020).
- Abstract published in Brain and Cognition, 2019. doi: 10.1016/j.bandc.2019.10.011

Automatic Detection of Epileptic Spikes in Intracerebral EEG with Convolutional Kernel Density Estimation.

- **Gardy L.**, Barbeau E.J., Hurter C.
- Proceedings of the 15th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications - Volume 2: HUCAPP, 2020. doi: 10.5220/0008877601010109.

A fast visual recognition memory system.

- Despouy E., Curot J., Deudon M., **Gardy L.**, Denuelle M., Sol J.C., Lotterie J.A., Valton L., Barbeau E.J.
- Cerebral cortex, 2019. doi: 10.1093/cercor/bhz287.

Spatial navigation disorders in preclinical AD explained by modifications of their cognitive maps.

- **Gardy L.**, Lhuillier A., Hurter C., Jouffrais C., Amieva H., Barbeau E.J.
- In prep.

Framework: how to study spatiotemporal data from a cities fluency task. An example for Alzheimer's Disease.

- **Gardy L.**, Lhuillier A., Hurter C., Jouffrais C., Amieva H., Barbeau E.J.
- In prep.

Posters

Epileptic spikes detection and visualization in intracerebral EEG with Convolutional Kernel Density Estimation.

- **Gardy L.**, Barbeau E.J., Hurter C.
- Workshop on Intracranial Recordings in humans: Epilepsy, DBS. WIRED, Paris, France. November 19-20, 2019.

Teaching

Physiology of the visual system, neurosensory physiology

Medical School of Toulouse Rangueil
Toulouse, France

- 2020 - 2021 Scholar year [10 hours].
- 2018 - 2019 Scholar year [10 hours].
- 2018 - 2019 Scholar year [10 hours].

Research Methodology

STAPS, University Paul Sabatier
Toulouse, France

- 2020 - 2021 Scholar year [36 hours].
- 2019 - 2020 Scholar year [36 hours].
- 2018 - 2019 Scholar year [24 hours].

Achievements

Prizes

- Best PhD project oral presentation award at the 10th scientific day of PhD Students. University Toulouse 2 Jean-Jaurès, Doctoral School CLESCO. **Gardy, L.**, Hurter, C., Barbeau, E.J. 2019. Study of the neuronal signal in epileptic patients implanted with deep intracerebral electrodes.

Fundings

PhD Scholarship funding

- Participation in the development and writing of the project with my two co-directors.
- EpiVis : Visualization and exploration of big data in the study of unitary neurons in epilepsy.
- Région Occitanie (55 320€) and Université Fédérale de Toulouse (36 880€).
- **Gardy L.**, Hurter C., Barbeau E.J.

Scientific animations

Coordinator of the Brain Awareness Week

(La Semaine Du Cerveau)

- Coordinator of the 2017 and 2018 editions in Toulouse, i.e. organization of the conferences, social events, looking for sponsors, supervision of volunteer teams...
- This major international one-week-long event is organized once a year in March, under the patronage of the Ministry of Higher Education, Research and Innovation, and coordinated by the Society of Neuroscience. I had the pleasure to represent the great French research institutes (CNRS and INSERM) and laboratories by coordinating this event during 2 editions in Toulouse.

Scientific workshop supervisor

- Participation in the 2019, 2020 and 2021 editions.
- The goal is to supervise students over the whole scholar year around a scientific project related to my work. The purpose of this workshop is to introduce them to the world of research and to stimulate their curiosity, their critical thinking and give them some extra work that they will present orally at the end of the year.

International conferences

Automatic Detection of Epileptic Spikes in Intracerebral EEG with Convolutional Kernel Density Estimation.

- 4th International Conference on Human Computer Interaction Theory and Applications. Valletta, Malta. February 27-29, 2020.

A Meta-Analysis of Semantic Memory in Mild Cognitive Impairment.

- Cognitive neuroscience of memory, recollection, familiarity and novelty detection. Liège, Belgium. October 3-4, 2019.

Mental imagery: neuropsychological bases, interest and applications in sports and for everyday life.

- 11th Exposciences Européenne at Hôtel Dieu, Toulouse, France. July 11, 2016.

National conferences

”AI, who Am I?”: Artificial intelligence (AI) to better understand the deep networks of our brain.

- Université Populaire de Philosophie de Toulouse, France, May 27, 2020.
- Online live because of the COVID-19 pandemic situation.

Meta-analysis of semantic memory in early Alzheimer’s disease.

- Congress Learning and Memory by the Toulouse Mind and Brain Institute (TMBI), at University Paul Sabatier, Toulouse, France. December 6, 2019.

Study of the neuronal signal in epileptic patients implanted with deep intracerebral electrodes.

- Best oral presentation award.
- 10th scientific day of PhD Students. University Toulouse 2 Jean-Jaurès, Doctoral School CLESCO, Toulouse, March 25, 2019.

How to better understand the epilepsy thanks to new technologies: my thesis in 18 minutes.

- Radio Campus, Toulouse, France. February 8, 2019.

How does the brain work?

- Amicale Laïque, Tournefeuille, France. January 29, 2019.

Study of spatial maps in the preclinical stages of Alzheimer’s disease.

- Congress Learning and Memory by the Toulouse Mind and Brain Institute (TMBI), at University Jean-Jaurès, Toulouse, France. November 27, 2017.

Spatial navigation abilities in Alzheimer’s Disease.

- Rotary Club, Cinema of Gaillac, France. March 24, 2017.

Introduction to neurosciences.

- Collège (middle school) Michelet, Toulouse, France. June 30, 2016.

Mathematics in biology: why and how?

- Institut des Mathématiques de Toulouse (University of mathematics), Toulouse, France. May 11, 2016.

What about neurosciences and how to access these professions?

- Forum des métiers, Lycée (High School) Pierre de Fermat, Toulouse, France. April 02, 2016.

Supervision of internship students (2018-2021)

- 1 Master 2 student supervision.
- 1 Master 2 student co-supervision.
- 2 Master 1 student supervision.
- 4 Prep School students supervision.
- 5 High School students supervision.
- 10 Middle School students supervision.

Other

Mental and Physical Trainer

- Sports coach graduated from university.
- State certified Fitness trainer and specialist in Weightlifting.
- Promoting physical activity in the lab by offering regular postural correction and rehabilitation exercises.