

Jesus G. Cruz-Garza

Postdoctoral Associate

Ithaca, NY | jgc243@cornell.edu | <http://jgcruzgarza.com/> | [Google Scholar](#)

My expertise is in mobile brain-body imaging (MoBI), through mobile EEG. My research is at the intersection of neuroscience, machine learning, engineering, the study of the human creative process. I apply machine learning techniques in mobile brain-body imaging data to identify neural features associated to how humans experience the creative process in real-world and immersive virtual reality settings.

Research Focus

Mobile Brain-Body Imaging | Mobile EEG | Brain-Computer Interfaces | Neuroaesthetics | Creativity | Machine Learning

Skills

Mobile Brain-Body Imaging | EEG | Matlab | EEGLAB | Neural Signal Processing | Machine Learning | Deep Learning | Functional Connectivity | Interdisciplinary | Research Supervision and Evaluation | Effective Communication | Scientific Outreach | Editor | English (full proficiency), Spanish (native) | Organizational Leadership

Research Experience

- 2020-Present Postdoctoral Associate
Design and Augmented Intelligence Laboratory, Cornell University, Ithaca, NY
 PI: Saleh Kalantari
- Neural dynamics associated to retail store design in VR (*in progress, but relevant to this application*)
 - a. Memory recollection of product location in different layout; Sustainable vs Non-sustainable product labels; Review vs no Review in proximity to products; Outdoor store façade
 - Neural markers of landmark recognition in VR.
 When people navigate in an urban VR environment, salient features of building landmarks were shown to be associated to theta-band modulation in parietal scalp regions.
 - Classroom design effect on cognitive performance and neural features.
 Neural features are affected by window placement and room dimensions in a VR classroom setting. This effect in frontal, parietal and occipital regions was observed consistently across participants.
 - Navigation-related brain dynamics in a VR pre-occupancy healthcare setting.
 The addition of color to highlight architectural features, and enhanced signage, yielded more efficient navigation strategies, and beta-band desynchronization in occipital regions.
- 2017-2019 Graduate Research Fellow: Doctoral Fellowship in High Performance Computing
Center for Advanced Computing and Data Science, University of Houston, Houston, TX
 PI: Jose L. Contreras-Vidal
- Multidisciplinary research in neuroaesthetics with mobile brain-body imaging. Co-editor in the book “Mobile Brain-Body Imaging and the Neuroscience of Art, Innovation and Creativity”. *Springer Series on Bio- and Neurosystems*. Springer, 2019.
 - Developed classical and deep learning techniques for neural feature extraction and visualization in real-world settings with freely moving participants.
 - Conducted longitudinal assay of individual neural patterns in the creative art over the span of approximately 18 months, developing the first longitudinal EEG dataset in a real-world setting.
- 2014-2017 Graduate Research Fellow: Doctoral Fellowship in Translational Research
Houston Methodist Research Institute-University of Houston, Houston, TX
 PI: Jose L. Contreras-Vidal
- Assaying neural individuality and variation in freely behaving people based on qEEG.
 First mobile EEG data collection in hundreds of participants in museum settings.
 - Functions and Development of Mirror Neuron System.
 Neural patterns associated to imitation behaviors in human infants (6-24 mo). Eunice Kennedy Shriver National Institutes of Child Health & Human Development, Program Grant P01 HD064653-01; 2014-2015.

Teaching Experience

- 2020-Present Postdoctoral research mentor, Design and Augmented Intelligence Laboratory, Cornell University.
- 2018-2020 Graduate research mentor, NSF Research Experience for Undergraduates, University of Houston BRAIN Center.
- 2014-2018 Graduate research mentor, Laboratory for Noninvasive Brain-Machine Interface Systems, University of Houston.
- 2015-2016 Teaching Fellow for first year Exploratory Studies students at University of Houston, Houston TX.

2010-2014 Physics laboratory instructor, Department of Physics, Tecnológico de Monterrey.

Education

2014-2019 Doctor of Philosophy, Electrical and Computer Engineering
University of Houston, Houston, TX
 Dissertation: Neural Characterization of the Improvisational Creative Process

2009-2014 Bachelor of Science, Engineering Physics
Tecnológico de Monterrey, Monterrey, México
 Honors

Awards (Selected)

2018 NSF ACACEME Fellowship. Future Faculty training and mentoring program.
 2017 Fellow Center for Advanced Computing and Data Systems (CACDS) in High Performance Computing (HPC).
 2015 University of Houston– Methodist Hospital Research Institute Graduate Fellowship in Translational Research.
 2015 Future Faculty Fellowship at University of Houston.

Memberships & Associations

Founder

2018-2019 BRAIN Center Student Group, at the University of Houston.

Executive Board

2018-2019 Co-President. Graduate and Professional Student Association (GPSA), at University of Houston.
 2017-2018 Treasurer. Graduate and Professional Student Association (GPSA), at University of Houston.
 2016-2017 Graduate representative. IEEE Student Branch at the University of Houston.

Member:

2015-*Present* IEEE, IEEE-EMBS, SFN, SHPE, BCI Society.

Professional Service

2020-*Present* Review Board Member, Sensors, MDPI.
 Reviewer, Sensors, MDPI.
 Reviewer, Electronics, MDPI.
 Reviewer, Mobile Brain-Body Imaging. Conference.
 Reviewer, Groundworks. Arts-inclusive research platform.
 Reviewer, Alliance for the Arts and Research Universities.

2019-*Present* Reviewer, Frontiers in Human Neuroscience.
 Reviewer, Frontiers in Neuroscience.

2020 Workshop organizational committee and reviewer. International Conference on Pattern Recognition (ICPR)-
 International Workshop on Artificial Intelligence for Healthcare Applications (AIHA).

2017-2019 Conference organizational committee and reviewer. Mobile Brain-body imaging and the neuroscience of art,
 innovation and creativity.

2017-2019 Logistics Coordinator, IEEE Engineering in Medicine and Biology Society, Houston Chapter.

2016-2017 IEEE Graduate Representative Chair, University of Houston.
 IEEEExtreme Logistics Coordinator.

Publications

1 Book (editor): Mobile Brain-Body Imaging and the Neuroscience of Art, Innovation, and Creativity. Springer, 2019.
 10 Peer-reviewed journal articles.
 6 Peer-reviewed book chapters.
 4 Peer-reviewed conference articles.
 2 datasets.
 30+ Conference abstracts and presentations.
 5 Peer-reviewed journal articles currently in review.