

Jesus G. Cruz-Garza

Mobile Brain-Body Imaging Scientist | Postdoctoral Fellow

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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 experiences in mobile settings, including virtual reality. I am also experienced with neurosurgery interventions and in vivo convection-enhanced drug delivery mechanisms for the brain.

Research Focus

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

Skills

Mobile Brain-Body Imaging (MoBI) | EEG | Matlab | EEGLAB | Lab Streaming Layer | Neural Signal Processing | Machine Learning | Deep Learning | Functional Connectivity | Scientific Outreach | Editor | English (full proficiency), Spanish (native)

Publications

15 Peer-reviewed journal articles (5 first author, 2 senior author).	1 Book (editor).
7 Peer-reviewed book chapters (2 first author).	3 datasets (1 first author).
4 Peer-reviewed conference articles.	30+ Conference abstracts and presentations.

Research Experience

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| Oct 2021 - <i>Present</i> | <p>Postdoctoral Fellow
Neural Electrokinetics Laboratory, Dept of Neurosurgery, Houston Methodist Research Institute, Houston TX.
PI: Amir Faraji</p> <ul style="list-style-type: none"> Brain/nerve-computer interfaces, in augmented reality (AR). Invasive and non-invasive. Electro-kinetic drug delivery into and from brain tissue. |
| Jan 2020 - Sept 2021 | <p>Postdoctoral Associate
Design and Augmented Intelligence Laboratory, Cornell University, Ithaca, NY
PI: Saleh Kalantari</p> <ul style="list-style-type: none"> Classroom design effect on cognitive performance, EEG neural features, and other psychological features. Neural features in frontal, parietal and occipital regions in frontal, parietal and occipital regions are affected by window placement and room dimensions in a VR classroom. Navigation-related EEG (MoBI) 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 IC dipoles in occipital regions. EEG Neural markers (MoBI) 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. |
| 2017-2019 | <p>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</p> <ul style="list-style-type: none"> Multidisciplinary research in neuroaesthetics with MoBI. Co-editor in the book "Mobile Brain-Body Imaging and the Neuroscience of Art, Innovation and Creativity". <i>Springer Series on Bio- and Neurosystems</i>. Springer, 2019. Developed classical and deep learning techniques for neural feature extraction and visualization in real-world settings with freely moving participants. |
| 2014-2017 | <p>Graduate Research Fellow: Doctoral Fellowship in Translational Research
Houston Methodist Research Institute-University of Houston, Houston, TX
PI: Jose L. Contreras-Vidal</p> <ul style="list-style-type: none"> 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). |

Teaching and Mentoring Experience

2022	Postdoctoral research mentor, Summer Undergraduate Research Internship, Neural Electrokinetics laboratory.
2020-2021	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

Awards (Selected)

2018-2022	NSF ACADEME Fellowship. Future Faculty training and mentoring program.
2017-2019	Fellow Center for Advanced Computing and Data Systems (CACDS) in High Performance Computing (HPC).
2015-2017	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.
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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.

Member:

2015-Present	IEEE, IEEE-EMBS, SFN, SHPE, BCI Society.
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Professional Service

Publons profile: <https://publons.com/researcher/1345990/jesus-gabriel-cruz-garza/peer-review/>

2021-Present	Reviewer, Scientific Reports, Springer Nature.
2020-Present	Review Board Member, Sensors, MDPI. Reviewer, MDPI: Sensors, Applied Sciences, Brain Sciences, Electronics. 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 Neuroscience, Frontiers in Human 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.
2016-2019	IEEE Graduate Representative Chair, University of Houston. IEEE at University of Houston, Logistics Coordinator