

Milton O. Candela-Leal

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EDUCATION

Tecnológico de Monterrey

Monterrey, Mexico

BS in Biomedical Engineering (GPA = 95/100 = 3.8/4.0)

2020 - Dec 2024

- Graduated with highest honors (*Summa Cum Laude*, top 5% of class)

- Top graduate in professional development (*Borrego de Oro*, 1/1500)

WORK & RESEARCH EXPERIENCE

Scale AI

2025-Present

Operations Specialist

- 2D LiDAR scene segmentation for autonomous vehicles through CV algorithms

NSF IUCRC BRAIN Center, Tecnológico de Monterrey

2021-2023, 2024-2025

Research Assistant

Supervisor: Prof. Mauricio A. Ramírez-Moreno, PhD

- Cognitive state decoding using ML on multi-modal biometrics (EEG, PPG/EDA)

- Force and acceleration prediction through RNN from pose-estimated keypoints

- Autonomous driving and HCI systems via multi-sensor (Camera, Radar, LiDAR)

- Engineering education through project-based learning and research simulators

- Designed a project: Influence of auditive noise in chess learning environments

- 1 grant with six universities on three continents via U21 Health Sciences Group

- 5 journal papers, 2 book chapters, 7 conference proceedings, +10 presentations

Boston Children's Hospital, Harvard Medical School

2023-2024

Research Intern

Supervisor: Prof. Kiho Im, PhD

- Fetal brain (sub)cortical MRI segmentation through attention-gated CNN U-Net

- Congenital disorder prediction via fetal brain features (volumetric, morphological)

- 2 first-author presentations, 4 co-author presentations

NSF IUCRC BRAIN Center, University of Houston

2022

Research Intern

Supervisor: Prof. Jose L. Contreras-Vidal, PhD

- Gaze influence on actors' synchronicity through EEG bispectrum and FC analysis

- 2 co-author presentations

JOURNAL ARTICLES & BOOK CHAPTERS

(* indicates equal contribution)

Candela-Leal M.O., Alanis-Espinosa, M., Murrieta-González, J. *et al.* (2025). Neural Signatures of STEM Learning and Interest in Youth. *Acta Psychologica*, 255, 104949.

doi:[10.1016/j.actpsy.2025.104949](https://doi.org/10.1016/j.actpsy.2025.104949). PubMed PMID:[40168892](https://pubmed.ncbi.nlm.nih.gov/40168892/)

Mandujano-Granillo, J.A., **Candela-Leal, M.O.**, Ortiz-Vazquez, J.J. *et al.* (2024). Human-Vehicle Interfaces: A Review for Autonomous Electric Vehicles. *IEEE Access*, 12, 121635–121658.

doi:[10.1109/ACCESS.2024.3450439](https://doi.org/10.1109/ACCESS.2024.3450439)

Blanco-Ríos, M.A.*, **Candela-Leal, M.O.***, Orozco-Romo, C. *et al.* (2024). Real-time EEG-based Emotion Recognition for Neurohumanities: Perspectives from Principal Component Analysis and Tree-based Algorithms. *Frontiers in Human Neuroscience*, 18, 1319574. doi:[10.3389/fnhum.2024.1319574](https://doi.org/10.3389/fnhum.2024.1319574).

PubMed PMID:[38545515](https://pubmed.ncbi.nlm.nih.gov/38545515/) (editor's choice, 2024)

Candela-Leal, M.O., Gutiérrez-Flores, E.A., Presbítero-Espinosa, G. *et al.* (2022). Multi-Output Sequential Deep Learning Model for Athlete Force Prediction on a Treadmill Using 3D Markers.

Applied Sciences, 12(11), 5424. doi:[10.3390/app12115424](https://doi.org/10.3390/app12115424)

Lozoya-Santos, J.J., Ramírez-Moreno, M.A., **Candela-Leal, M.O.** *et al.* (2022). Current and Future Biometrics: Technology and Applications. In R.A. Ramirez-Mendoza, J.J. Lozoya-Santos, R. Zavala-Yoé *et al.* (Eds.), *Biometry: Technology, Trends and Applications* (1st ed., pp. 1–30). Boca Raton, FL: CRC Press. doi:[10.1201/9781003145240-1](https://doi.org/10.1201/9781003145240-1) ISBN: 9781003145240

Ramírez-Moreno, M.A., Carrillo-Tijerina, P., **Candela-Leal, M.O.** *et al.* (2021). Evaluation of a Fast Test Based on Biometric Signals to Assess Mental Fatigue at the Workplace—A Pilot Study.

International Journal of Environmental Research and Public Health, 18(22), 11891.

doi:[10.3390/ijerph182211891](https://doi.org/10.3390/ijerph182211891). PubMed PMID:[34831645](https://pubmed.ncbi.nlm.nih.gov/34831645/)

CONFERENCE PROCEEDINGS

- Candela-Leal, M.O.**, Ramírez-Moreno, M.A., & Lozoya-Santos, J.J. (*accepted*). Task Resolution Time Estimation through Cognitive Load: An EEG Study of Chess Players. In *Proceedings of the 47th Annual Meeting of the Cognitive Science Society (CogSci)*. San Francisco, CA: Taylor & Francis
- Ramírez-Arceo, G.A., **Candela-Leal, M.O.**, Tudon-Martínez, J.C. *et al.* (*accepted*). Innovative Spaces with Advanced Technologies such as Research Activity Simulators for Engineering Education. In *Proceedings of the 16th Global Engineering Education Conference (EDUCON)*. London, United Kingdom: IEEE
- Candela-Leal, M.O.**, Aguilar-Herrera, A.J., Ramírez-Moreno, M.A. *et al.* (2024). Conscious Technologies Projects as a Hub for Real Life Challenges in Engineering Education. In *Proceedings of the 15th EDUCON*. Kos, Greece: IEEE. doi:[10.1109/EDUCON60312.2024.10578738](https://doi.org/10.1109/EDUCON60312.2024.10578738)
- Candela-Leal, M.O.**, Martínez-Díaz, D., Orozco-Romo, C. *et al.* (2023). Biomechanics Digital Twin: Markerless Joint Acceleration Prediction Using Machine Learning and Computer Vision. In *Proceedings of the Future of Educational Innovation-Workshop Series: Data in Action*. Monterrey, Mexico: IEEE. doi:[10.1109/IEEECONF56852.2023.10104757](https://doi.org/10.1109/IEEECONF56852.2023.10104757)
- Candela-Leal, M.O.**, García-Briones, J.M., Olivas-Martínez, G. *et al.* (2021). Real-time Biofeedback System for Interactive Learning using Wearables and IoT. In *Proceedings of the 6th International Conference on Industrial Engineering and Operations Management*. Monterrey, Mexico: IEOM. doi:[10.46254/NA06.20210487](https://doi.org/10.46254/NA06.20210487) (**best undergraduate paper award**)
- Olivas-Martínez, G., **Candela-Leal, M.O.**, Ocampo-Alvarado, J.C. *et al.* (2021). Detecting Change in Engineering Interest in Children through Machine Learning using Biometric Signals. In *Proceedings of the Machine Learning-Driven Digital Technologies for Educational Innovation Workshop*. Monterrey, Mexico: IEEE. doi:[10.1109/IEEECONF53024.2021.9733772](https://doi.org/10.1109/IEEECONF53024.2021.9733772)

INVITED TALKS

Invited Lecturer , Educational Research Seminar, Universidad José Martí	Jun 2025
Panelist , Biomedical Engineering Week, Tecnológico de Monterrey	May 2025
Panelist , NeuroTalks@Tec: Meet the Experts, Tecnológico de Monterrey	Mar 2025
Guest Lecturer , Cognitive Neuroscience Seminar, Tecnológico de Monterrey	Sep 2024
Invited Lecturer , Computing Seminar, UANL	Apr 2023

SELECTED PRESENTATIONS

Oral Presentations

Digital Twins in Education: Enhancing Student Well-being and Academic Performance with Biometric Insights and Machine Learning. <i>U21 Health Sciences Group 2024 Annual Meeting</i> , Amsterdam University Medical Centers (Amsterdam, Netherlands) (student speaker award)	2024
High-resolution Fetal Subplate Automatic Segmentation. <i>FNNDSC Research Symposium</i> , Boston Children's Hospital (Boston, MA)	2024
CHD Fetal Brain Analysis using Combined Quantitative MRI Features and Custom-build Loss Functions. <i>FNNDSC Research Symposium</i> , Boston Children's Hospital (Boston, MA)	2024
Biomechanics for the Digital Twin of Performance: Study Cases. <i>Conscious Technologies for Smart Communities Workshop</i> (Virtual)	2021

Poster Presentations

FALCONS: Fetal Automatic Landmark Computation and Optimization for Neuroimaging Segmentation. <i>27th International Conference on MICCAI</i> (Marrakesh, Morocco)	2024
Real-time Dual-feature Mental Fatigue State SVM Classification using EEG Delta Bandpower. <i>19th IEEE-EMBS International Conference on BSN</i> , MIT Media Lab (Boston, MA)	2023
Biometric Cabin for Neurohumanities Lab. <i>NSF IUCRC BRAIN 2023 Annual Meeting</i> , Arizona State University (Phoenix, AZ)	2023
Brain on Acting: Neural Dynamics of Actor-Actor Dyads During an Acted Scene. <i>NSF IUCRC BRAIN 2022 Annual Meeting</i> , University of Houston (Houston, TX)	2022
Identifying Engineering Interest in Children through Machine Learning using Biometric Signals. <i>43rd Annual Conference of the IEEE-EMBS</i> (Virtual)	2021
Digital Twin of Biomechanics: Joint Force Prediction using Video and AI. At the <i>NSF IUCRC BRAIN 2021 Annual Meeting</i> (Virtual)	2021

HONORS AND AWARDS

Editor's Choice Selection , Frontiers in Human Neuroscience [eBook] Top 3% of 2024 papers (16/510) based on quality.	2025
Summa Cum Laude , Tecnológico de Monterrey Top 5% of the graduating class (highest academic honors).	2024
Borrego de Oro , Tecnológico de Monterrey [newsletter] Top graduate in professional development, among ~1,500 Fall 2024 graduates.	2024
Excellence Diploma , Tecnológico de Monterrey	2024
International Diploma , Tecnológico de Monterrey	2024
Student Speaker Award , U21 Health Sciences Group [newsletter] One of the two teams that won funding (\$1600 USD) to present at U21 HSG '24, selected from MSc/BSc research projects across 21 universities on all continents.	2024
Outstanding Student Award , Tecnológico de Monterrey Top 1% of engineering students (80/8000) with the most outstanding trajectories.	2023, 2024
1 st Place - Undergraduate Student Paper Competition, 6 th North American IEOM	2021
1 st Place - R&D Improvement Proposals (\$250 USD), 18 th Conexión Tec	2021
Academic Talent Scholarship , Tecnológico de Monterrey	2020

WORKING PAPERS

Qiu, B., Gondova, A., Candela-Leal, M.O. <i>et al.</i> (<i>under review</i>). Regional Analysis of Error Patterns from Automatic Cortical Plate Segmentation in Fetal Brain MRI.	
Gondova, A., Candela-Leal, M.O. , Yun, H.J. <i>et al.</i> (<i>under review</i>). Attention-gated Convolutional Neural Network for Automated Segmentation of Fetal Subplate from MRI.	
Candela-Leal, M.O. , Wong-Cantú, C.G., Ramírez-Moreno, M.A. <i>et al.</i> (<i>submitted</i>). Enhancing Engagement with Immersive Spaces: A Biomechanical Analysis of Dance	
Candela-Leal, M.O. , Marrufo-Franco, L.A., Cruz-Gómez, C.F. <i>et al.</i> (<i>submitted</i>). Closed-Loop BCI with Haptic Feedback and Machine Learning for Attention Support in ADHD Students	
Candela-Leal, M.O. , Martínez-Hernández, A., Moreno-Salazar, I.E. <i>et al.</i> (<i>in prep</i>). Enhanced Real-Time EEG-based Emotion Recognition using an Spherical VAD Model	
Candela-Leal, M.O. , Tudon-Martinez, J.C., & Lozoya-Santos, J.J. (<i>in prep</i>). Multi-Sensor Fusion for Vehicle Perception and Intent Recognition in Adverse Weather: A Review	

TEACHING EXPERIENCE

German A2 Teacher, Mentoor MX	2022-2024
Middle School Math and Spanish Teacher, Aprendamos Juntos	2021-2022
Independent High School Physics Teacher	Fall 2019
FIRST® LEGO® League Mentor, Little Minds	Spring 2019

GRANTS

SimEmotions: An Emotion-Centered Collaborative Learning Platform, <i>Project Groups Funding: Clinical Simulation (\$5000 USD)</i> , U21 Health Sciences Group, with Prof. Karien Henrico (University of Johannesburg), Prof. Sandra Monteiro (McMaster University), Prof. Ignacio Andrés Villagrán Gutiérrez (PUC Chile), Prof. Allison Mandrusiak (The University of Queensland), and Prof. John Fung (The University of Hong Kong)	2025-2026
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SKILLS SUMMARY

Languages	Python (3 years), R (2 years), MATLAB (1 year), SQL (1 year), Shell (3 months) English (C1), German (B1), Spanish
Frameworks	Numpy, Scipy, Pandas, Matplotlib, Scikit-learn, OpenCV, TensorFlow, Keras, BrainFlow FreeSurfer, FSL, MRtrix3, NiBabel, ANTs, PyDicom, IRTK, NUC, TochIO, MNE, OSC
Tools	Git, Anaconda, CUDA, CMake, Tableau, Microsoft Excel, G*Power, Overleaf, \LaTeX
Platforms	Linux, Ubuntu, ROS, Windows, Arduino, Raspberry

PRESS

TecScience, Neurohumanities Lab: Detecting Emotions in Real Time to Transform Education	2025
TecScience, Future Classrooms of the Future: Real-Time Monitoring of Students' Brain Activity	2025
NSF IUCRC BRAIN, BRAIN Center Spring Newsletter (pp. 4, 9-10)	2023

Last Update: June 2025