Milton Candela

milton_candela@hotmail.com
miltoncandela.github.io

Education

Tecnológico de Monterrey, Monterrey, Mexico — Dec 2024
Bachelor of Science in Biomedical Engineering — GPA: 3.8/4.0

- Graduated with highest honors (*Summa Cum Laude*, top 5% of class)
- Top graduate in professional development (*Borrego de Oro*, 1/1500)

Summary

BME graduate with 5 years of research in real-time, non-invasive decoding of human cognitive states and closed-loop neurofeedback integrating haptic, TMS, and electrical stimulation. Experienced in high-density EEG/EMG, and fetal MRI statistical/machine learning analysis, and deep learning modeling (RNN/CNN) with Python, MATLAB, and R. Author of 15+ publications and 20+ international presentations on (1) BCIs for neuroeducation, (2) biomechanical modeling, (3) fetal brain imaging, and (4) spinal cord injury rehabilitation. Interested in modeling spatiotemporal neural dynamics underlying cognitive decline (e.g., memory and decision-making), to develop adaptive neural interfaces for cognitive enhancement and rehabilitation.

Research Experience

Houston Methodist — 08/2025 - *Present*
Research Assistant I
Supervisor: Prof. Dimitry G. Sayenko, PhD

- Closed-loop motor execution BCI for SCI upper-limb rehabilitation using ESS

Tecnologico de Monterrey — 03/2021 - 07/2023, 08/2024 - 07/2025
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
- 2 grants with six universities on five continents via U21 Health Sciences Group
- 5 journal articles, 3 book chapters, 8 conf. proceedings, +15 intl. presentations

Boston Children's Hospital — 08/2023 - 07/2024
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

Selected Peer-Reviewed Publications *(* indicates equal contribution)*

10. **Candela MO***, Calderón-Gurubel JE*, et al. (*in prep*). Are you Afraid? Neurophysiological and Autonomic Responses to Fear in a Semi-Immersive Interactive Environment
9. Gondova A, ..., **Candela MO**, et al. (*under review*). Typical Development of the Human Fetal Subplate: Regional Heterogeneity, Growth, and Asymmetry Assessed by *in vivo* T2-weighted MRI.
8. **Candela MO**, et al. (*under review*). Toward Emotionally Adaptive Learning Spaces: Brain–Body Engagement in Immersive Dance Improvisation.
7. **Candela-Leal MO**, et al. (2026). Closed-Loop Haptic Neurofeedback BCI for Real-Time Student Attention Regulation. In *48th CNIB*. Monterrey, Mexico: Springer.
6. **Candela-Leal MO**, et al. (2025). Task Resolution Time Estimation through Cognitive Load: An EEG Study of Chess Players. In *47th CogSci Annual Meeting*. San Francisco, CA: eScholarship. id:6qh4q558

5. **Candela-Leal MO**, et al. (2025). Neural Signatures of STEM Learning and Interest in Youth. *Acta Psychol.*, 255(104949), 104949. doi:10.1016/j.actpsy.2025.104949. PMID:40168892
4. Blanco-Ríos MA*, **Candela-Leal MO***, et al. (2024). Real-time EEG-based Emotion Recognition for Neurohumanities: Perspectives from Principal Component Analysis and Tree-based Algorithms. *Front. Hum. Neurosci.*, 18, 1319574. doi:10.3389/fnhum.2024.1319574. PMID:38545515
3. **Candela-Leal MO**, et al. (2023). Biomechanics Digital Twin: Markerless Joint Acceleration Prediction Using Machine Learning and Computer Vision. In *Future of Educational Innovation-Workshop Series: Data in Action*. Monterrey, Mexico: IEEE. doi:10.1109/IEEECONF56852.2023.10104757
2. **Candela-Leal MO**, et al. (2022). Multi-Output Sequential Deep Learning Model for Athlete Force Prediction on a Treadmill Using 3D Markers. *Appl. Sci.*, 12(11), 5424. doi:10.3390/app12115424
1. Ramírez-Moreno MA, ..., **Candela-Leal MO**, et al. (2021). Evaluation of a Fast Test Based on Biometric Signals to Assess Mental Fatigue at the Workplace—A Pilot Study. *Int. J. Environ. Res. Public Health*, 18(22), 11891. doi:10.3390/ijerph182211891. PMID:34831645

Honors and Awards

2025 **Editor's Choice Selection**, Frontiers in Human Neuroscience (top 3% of 2024 papers)
2024 **Summa Cum Laude**, Tecnologico de Monterrey (top 5% of the graduating class)
2024 **Excellence Diploma for Comprehensive Training**, Tecnologico de Monterrey
2024 **Best in Professional Development**, Tecnologico de Monterrey (among ∼1,500 graduates)
2024 **International Diploma**, Tecnologico de Monterrey
2024 **Student Speaker Award ($1600 USD)**, U21 Health Sciences Group (among 21 universities)
2023 **Outstanding Student Award**, Tecnologico de Monterrey (1% of all engineering students)
2021 **Best Undergraduate Paper**, 6th North American IEOM, IEOM Society International
2020 **Academic Talent Scholarship**, Tecnologico de Monterrey

Grants

2026-2027 Emotions in Action: Cross-Cultural Exploration of Student Experiences in Clinical Simulation, *Research Development Fund ($15k USD)*, U21 HSG
2025-2026 SimEmotions: An Emotion-Centered Collaborative Learning Platform, *Project Groups Funding: Clinical Simulation ($5k USD)*, U21 HSG, 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)

US & International Presentations *(* denotes co-autor presenting)*

Oral 1st *GCC-RR* (Houston, TX, 2025), *IINAA* ×2 (Houston, TX, 2025), *U21 HSG Annual Meeting* (Amsterdam, Netherlands, 2024), and *FNNDSC Research Symposium* ×3 (Boston, MA, 2024)
Poster 47th *CogSci* (San Francisco, CA, 2025), 31st *OHBM Annual Meeting** ×2 (Brisbane, Australia, 2025), 27th *MICCAI** (Marrakesh, Morocco, 2024), 19th *IEEE-EMBS BSN* (Boston, MA, 2023), *BRAIN Annual Meeting* ×3 (Phoenix, AZ, 2023), *BRAIN Annual Meeting* ×2 (Houston, TX, 2022), 43rd *IEEE-EMBC** ×2 (Virtual, 2021), and *BRAIN Annual Meeting* ×3 (Virtual, 2021)

Invited Talks

2025 **Universidad Jose Marti**, Educational Research Seminar
2025 **Tecnologico de Monterrey**, Biomedical Engineering Week
2025 **Tecnologico de Monterrey**, NeuroTalks@Tec: Meet the Experts
2024 **Tecnologico de Monterrey**, Cognitive Neuroscience Seminar
2023 **Universidad Autonoma de Nuevo Leon (UANL)**, Computing Seminar

Last Update: November 2025