Milton O. Candela-Leal

milton_candela@hotmail.com
miltoncandela.github.io

Education

Tecnológico de Monterrey - Monterrey, Mexico — Aug 2020 - Dec 2024
BS in Biomedical Engineering (94.5/100 = 3.8/4.0 GPA)

International Baccalaureate - Monterrey, Mexico — Aug 2018 - May 2020
Math HL, Psychology SL, Physics SL, ...
Thesis: *Harry Potter and the Prisoner of Azkaban* (2004), a Cultural and Ideological Instructor of the Millennial Viewer

Research Experience

Boston Children's Hospital - Cambridge, MA, USA — Aug 2023 - Aug 2024
Harvard Medical School
Advisor: Kiho Im, Ph.D.
Project: *High-res Fetal Subplate Segmentation*
Unsupervised VAE-GAN for Anomaly
Non-linear qMRI for CHD Classification

NSF IUCRC BRAIN Center - Monterrey, Mexico — Mar 2021 - Jul 2023
TMX BRAIN Site - *Tecnológico de Monterrey*
Advisor: Mauricio A. Ramírez-Moreno, Ph.D.
Project: *Advanced Learner Assistance System (ALAS)*
Talent and Passion Detection Through Biometrics
Biomechanics for the Digital Twin
Neurohumanities Lab
Digital Twin of the Workspace

NSF IUCRC BRAIN Center - Houston, TX, USA — Spring 2022
UH BRAIN Site - *University of Houston*
Advisor: Jose L. Contreras-Vidal, Ph.D.
Project: *Brain on Acting*

Journal Articles

(† indicates equal contribution)

Blanco-Ríos, M.A.†, **Candela-Leal, M.O.**†, Orozco-Romo, C., Remis-Serna, P., ... Ramírez-Moreno, M.A. (2024). Real-time EEG-based Emotion Recognition for Neurohumanities: Perspectives from Principal Component Analysis and Tree-based Algorithms. *Frontiers in Human Neuroscience*, 18() [paper] [preprint]

Candela-Leal, M.O., Gutiérrez-Flores, E.A., Presbítero-Espinosa, G., Sujatha-Ravindran, A., ... Ramírez-Moreno, M.A. (2022). Multi-Output Sequential Deep Learning Model for Athlete Force Prediction on a Treadmill Using 3D Markers. *Applied Sciences*, 12(11), 5424 [paper]

Ramírez-Moreno, M.A., Carrillo-Tijerina, P., **Candela-Leal, M.O.**, Alanis-Espinosa, M., ... Lozoya-Santos, J.J. (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 [paper]

Candela-Leal, M.O., Alanis-Espinosa, M., Murrieta-González, J., Lozoya-Santos, J.J, & Ramírez-Moreno, M.A. *(in press).* Neurocognitive Insights into STEM Learning: An Integrated Analysis of Bandpower and Functional Connectivity among Youth. *Thinking Skills and Creativity*

Book Chapters

Lozoya-Santos, J.J., Ramírez-Moreno, M.A., Diaz-Armas, G.G., **Candela-Leal, M.O.**, ... Ramirez-Mendoza, R.A. (2022). "Current and Future Biometrics: Technology and Applications." In R.A. Ramirez-Mendoza, J.J. Lozoya-Santos, R. Zavala-Yoé, L.M. Alonso-Valerdi, ... H.G. Gonzalez-Hernandez (Eds.), *Biometry: Technology, Trends and Applications* (1st ed., pp. 1–30). Boca Raton, FL: CRC Press. ISBN: 9781003145240 [paper]

Conference Proceedings

(† indicates equal contribution)

Candela-Leal, M.O., Aguilar-Herrera, A.J., Ramírez-Moreno, M.A., Félix-Herrán L.C., ... Lozoya-Santos, J.J. (2024). Conscious Technologies Projects as a Hub for Real Life Challenges in Engineering Education. *15th Global Engineering Education Conference (EDUCON)*. Kos, Greece: IEEE

Candela-Leal, M.O., Martínez-Díaz, D., Orozco-Romo, C., Aguilar-Herrera, A.J., ... Ramírez-Moreno, M.A. (2023). Biomechanics Digital Twin: Markerless Joint Acceleration Prediction Using Machine Learning and Computer Vision. In *2023 Future of Educational Innovation-Workshop Series Data in Action* (pp. 142-150). Monterrey, Mexico: IEEE [paper]

Candela-Leal, M.O., García-Briones, J.M., Olivas-Martínez, G., Abrego-Ramos, R., ... Lozoya-Santos, J.J. (2021). Real-time Biofeedback System for Interactive Learning using Wearables and IoT. In *6th North American Industrial Engineering and Operations Management (IEOM)* (pp. 2959-2970). Monterrey, Mexico: IEOM **(best undergraduate paper)** [paper]

Aguilar-Herrera, A.J.†, Delgado-Jimenez, E.A.†, **Candela-Leal, M.O.**, Olivas-Martinez, G., ... Ramirez-Mendoza, R.A. (2021). Advanced Learner Assistance System's (ALAS) recent results. In *2021 Machine Learning-Driven Digital Technologies for Educational Innovation Workshop* (pp. 26-33). Monterrey, Mexico: IEEE [paper]

Olivas-Martínez, G., **Candela-Leal, M.O.**, Ocampo-Alvarado, J.C., Acosta-Soto, L.F., ... Ramírez-Moreno, M.A. (2021). Detecting Change in Engineering Interest in Children through Machine Learning using Biometric Signals. In *2021 Machine Learning-Driven Digital Technologies for Educational Innovation Workshop* (pp. 33-40). Monterrey, Mexico: IEEE [paper]

Invited Talks

Candela-Leal, M.O. (2023, April). Computer Vision and Facial Recognition. Presented to Senior Undergraduate Computer Science Students in *Computing Seminar* at the Universidad Autónoma de Nuevo León, Monterrey, Mexico [certificate] [slides]

Abstracts

Candela-Leal, M.O., Lozoya-Santos, J.J., & Ramírez-Moreno, M.A. (2023, October). Real-time Dual-feature Mental Fatigue State SVM Classification using EEG Delta Bandpower [Poster #35]. In *19th IEEE-EMBS International Conference on Body Sensor Networks*, Boston, MA [poster]

Honors and Awards

Outstanding Student Award (top 1% best engineering trajectories)	2023
1st Place - Research and Improvement Proposals at 18th Conexión Tec	Fall 2021
1st Place - Undergraduate Student Paper Competition at 6th NA IEOM	2021
Outstanding IB Extended Essay - 51th Research and Development Congress	2021
Scholarship for Academic Talent - *Tecnológico de Monterrey*	2020

Teaching

German A2 Teacher - *Mentoor*	2022-2023
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

Skills Summary

Languages	Python (3 years), MATLAB (2 years), R (1 year), SQL (3 months) English (C1), German (B1), Spanish
Frameworks	Numpy, Scipy, Pandas, Matplotlib, Scikit-learn, OpenCV, TensorFlow, Keras, BrainFlow Lattice, Dplyr, Tidyr, Caret, GA, Ggplot, Shiny FSL, FreeSurfer, MRtrix3, ANTs, NiBabel, PyDicom, IRTK
Tools	Git, Anaconda, CUDA, cuDNN, Tableau, Microsoft Excel, Overleaf, LaTeX
Platforms	Linux, ROS, Windows, Arduino, Raspberry
Soft Skills	Leadership, Problem Solving, Teamwork, Self-Learning, Time Management