Milton O. Candela-Leal

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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: [Film & Psychology] *Harry Potter and the Prisoner of Azkaban* (2004), a
   Cultural and Ideological Instructor of the Millennial Viewer

RESEARCH EXPERIENCE

Boston Children's Hospital - Boston, MA, USA   Aug 2023 - Jul 2024
Harvard Medical School
 Advisor: Kiho Im, PhD
 Projects: Fetal MRI subplate segmentation (attention U-Net), non-linear qMRI for
   congenital heart disease classification, VAE-GAN for anomaly detection.

NSF IUCRC BRAIN Center - Monterrey, Mexico   Mar 2021 - Jul 2023
TMX BRAIN Site - *Tecnológico de Monterrey*
 Advisor: Mauricio A. Ramírez-Moreno, PhD
 Projects: Cognitive state prediction via biometrics (EEG, ECG, Computer Vision)
   and machine learning: Mental fatigue, interest in STEM, emotion.
   Force prediction via OpenPose human predicted keypoints and RNN.

NSF IUCRC BRAIN Center - Houston, TX, USA   Spring 2022
UH BRAIN Site - *University of Houston*
 Advisor: Jose L. Contreras-Vidal, PhD
 Projects: EEG Functional Connectivity and bisprectrum analysis between actors.

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, 1319574. PMID: 38545515. doi:10.3389/fnhum.2024.1319574

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. doi:[10.3390/app12115424](10.3390/app12115424)

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. PMID: 34831645. doi:10.3390/ijerph182211891

Candela-Leal, M.O., Alanis-Espinosa, M., Murrieta-González, J., Lozoya-Santos, J.J, & Ramírez-Moreno, M.A. *(submitted)*. 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. doi:[10.1201/9781003145240-1](10.1201/9781003145240-1). ISBN: 9781003145240.

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 (UANL), Monterrey, Mexico

Conference Proceedings

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. doi:10.1109/IEEECONF56852.2023.10104757

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 undergrad paper)**. doi:10.46254/NA06.20210487

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. doi:10.1109/IEEECONF53024.2021.9733772

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. doi:10.1109/IEEECONF53024.2021.9733770

Conference Presentations

Oral Presentation

FNNDSC Research Symposium	(Boston, MA)	Mar 2024
51th Research and Development Congress	(Monterrey, Mexico)	Feb 2021

Poster Presentation

19th IEEE-EMBS International Conference on BSN	(Boston, MA)	Oct 2023
NSF BRAIN Summer Annual IAB Meeting	(Phoenix, AZ)	Jul 2023
21th Expo Ingenierías at Conexión Tec	(Monterrey, Mexico)	Jun 2023
BMEX: Engineering and Health Sciences Symposium	(Monterrey, Mexico)	May 2023
19th & 20th Expo Ingenierías at Conexión Tec	(Monterrey, Mexico)	Jun, Nov 2022
NSF BRAIN Summer Annual IAB Meeting	(Houston, TX)	Aug 2022
17th & 18th Expo Ingenierías at Conexión Tec	(Monterrey, Mexico)	Jun, Nov 2021
43rd Annual International Conference of the IEEE-EMBS	(Virtual)	Oct 2021

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
Scholarship for Academic Talent - *Tecnológico de Monterrey*	2020

Teaching

German A2 Teacher - *Mentoor*	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

Skills Summary

Languages	Python (3 years), MATLAB (2 years), R (1 year), Shell (3 months), 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, Ubuntu, ROS, Windows, Arduino, Raspberry