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. *(under review)*. 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., & Valdivia-Padilla, A. (2024, August). Digital Twins in Education: Enhancing Student Well-being and Academic Performance with Biometric Insights and Machine Learning. *U21 Health Sciences Group 2024 Annual Meeting*, Amsterdam University Medical Centers, Amsterdam, Netherlands. (Theme: Data Driven Health Care and Teaching) **(student speaker travel award)**

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

SELECTED 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 undergraduate paper award)**. 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

CONFERENCE PRESENTATIONS

Oral Presentations

FNNDSC Research Symposium	(Boston, MA)	Mar 2024
Conscious Technologies for Smart Communities Workshop	(Virtual)	July 2021
51th Research and Development Congress	(Virtual)	Feb 2021

Poster Presentations

19th IEEE-EMBS International Conference on BSN	(Boston, MA)	Oct 2023
NSF BRAIN Summer Annual IAB Meeting	(Phoenix, AZ)	Jul 2023
21st 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	(Virtual)	Jun, Nov 2021
43rd Annual International Conference of the IEEE-EMBS	(Virtual)	Oct 2021

HONORS AND AWARDS

Student Speaker Travel Award ($1600 USD) - *U21 Health Sciences*	2024
1st Place - Undergraduate Student Paper Competition - *6th NA IEOM*	2021

Tecnológico de Monterrey

Outstanding Student Award (top 1% best engineering trajectories)	2023
1st Place - R&D Improvement Proposals ($250 USD) - *18th Conexión Tec*	Fall 2021
Academic Talent Scholarship	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