Milton O. Candela-Leal

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EDUCATION

Tecnológico de Monterrey - Monterrey, Mexico   2020 - Dec 2024
    BSc in Biomedical Engineering (95/100 = 3.8/4.0 GPA)
International Baccalaureate - Monterrey, Mexico   2018 - 2020

RESEARCH EXPERIENCE

Tecnológico de Monterrey - Monterrey, Mexico   Mar 2021 - Jul 2023, Fall 2024
NSF IUCRC BRAIN Center
    Advisor: Prof. 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 employing Computer Vision's keypoints and RNN.

MIT Media Lab - Boston, MA, USA   Summer 2024
Massachusetts Institute of Technology
    Advisor: Samantha Chan, PhD
    Project: EEG slow wave brain analysis for sleep quality improvement.

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

University of Houston - Houston, TX, USA   Spring 2022
NSF IUCRC BRAIN Center
    Advisor: Prof. Jose L. Contreras-Vidal, PhD
    Project: EEG functional connectivity and bisprectrum analysis between actors.

JOURNAL ARTICLES

(† indicates equal contribution)

Mandujano-Granillo, J.A., **Candela-Leal, M.O.**, Ortiz-Vazquez, J.J., ... Lozoya-Santos, J.J. (2024). Human-Vehicle Interfaces: A Review for Autonomous Electric Vehicles. <u>IEEE Access</u>, 12, 121635–121658. doi:10.1109/ACCESS.2024.3450439

Blanco-Ríos, M.A.†, **Candela-Leal, M.O.**†, Orozco-Romo, C., ... Ramírez-Moreno, M.A. (2024). Real-time EEG-based Emotion Recognition for Neurohumanities: Perspectives from Principal Component Analysis and Tree-based Algorithms. <u>Frontiers in Human Neuroscience</u>, 18, 1319574. doi:10.3389/fnhum.2024.1319574. PubMed PMID:[38545515](38545515)

Candela-Leal, M.O., Gutiérrez-Flores, E.A., Presbítero-Espinosa, G., ... Ramírez-Moreno, M.A. (2022). Multi-Output Sequential Deep Learning Model for Athlete Force Prediction on a Treadmill Using 3D Markers. <u>Applied Sciences</u>, 12(11), 5424. doi:[10.3390/app12115424](10.3390/app12115424)

Ramírez-Moreno, M.A., Carrillo-Tijerina, P., **Candela-Leal, M.O.**, ... Lozoya-Santos, J.J. (2021). Evaluation of a Fast Test Based on Biometric Signals to Assess Mental Fatigue at the Workplace—A Pilot Study. <u>International Journal of Environmental Research and Public Health</u>, 18(22), 11891. doi:10.3390/ijerph182211891. PubMed PMID:[34831645](34831645)

BOOK CHAPTERS

Lozoya-Santos, J.J., Ramírez-Moreno, M.A., **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, ... H.G. Gonzalez-Hernandez (Eds.), <u>Biometry: Technology, Trends and Applications</u> (1st ed., pp. 1–30). Boca Raton, FL: CRC Press. doi:[10.1201/9781003145240-1](10.1201/9781003145240-1) ISBN: 9781003145240

CONFERENCE PROCEEDINGS

Candela-Leal, M.O., Lozoya-Santos, J.J., Ramírez-Moreno, M.A. (*accepted*). Task Completion Time Estimation via EEG Theta Bandpower during Chess-Based Problem-Solving. In <u>IEEE-EMBS BHI</u>. Houston, TX: IEEE

Candela-Leal, M.O., Aguilar-Herrera, A.J., Ramírez-Moreno, M.A., ... Lozoya-Santos, J.J. (2024). Conscious Technologies Projects as a Hub for Real Life Challenges in Engineering Education. In 15<u>th</u> EDUCON (pp. 665-675). Kos, Greece: IEEE. doi:10.1109/EDUCON60312.2024.10578738

Candela-Leal, M.O., Martínez-Díaz, D., Orozco-Romo, C., ... Ramírez-Moreno, M.A. (2023). Biomechanics Digital Twin: Markerless Joint Acceleration Prediction Using Machine Learning and Computer Vision. In 3<u>rd</u> FEI-WS (pp. 142-150). Monterrey, Mexico: IEEE. doi:10.1109/IEEECONF56852.2023.10104757

Candela-Leal, M.O., García-Briones, J.M., Olivas-Martínez, G., ... Lozoya-Santos, J.J. (2021). Real-time Biofeedback System for Interactive Learning using Wearables and IoT. In 6<u>th</u> North American 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., ... Ramírez-Moreno, M.A. (2021). Detecting Change in Engineering Interest in Children through Machine Learning using Biometric Signals. In 1<u>st</u> FEI-WS (pp. 33-40). Monterrey, Mexico: IEEE. doi:10.1109/IEEECONF53024.2021.9733772

Aguilar-Herrera, A.J., Delgado-Jimenez, E.A., **Candela-Leal, M.O.**, ... Ramirez-Mendoza, R.A. (2021). Advanced Learner Assistance System's (ALAS) recent results. In 1<u>st</u> FEI-WS (pp. 26-33). Monterrey, Mexico: IEEE. doi:10.1109/IEEECONF53024.2021.9733770

INVITED TALKS

Digital Twins in Education,	2024
U21 HSG, Amsterdam UMC - Faculty of Medicine **(speaker travel award)**	
Computer Vision and Facial Recognition,	2023
Computing Seminar, UANL - School of Physics and Mathematics	

CONFERENCE PRESENTATIONS

Oral Presentations

27<u>th</u> International Conference on MICCAI	(Marrakesh, Morocco)	2024
FNNDSC Research Symposium	(Boston, MA)	2024
Conscious Technologies for Smart Communities Workshop	(Virtual)	2021
51<u>th</u> Research and Development Congress	(Virtual)	2021

Poster Presentations

SACNAS NDiSTEM International Conference	(Phoenix, AZ)	2024
17<u>th</u> - 21<u>st</u> Expo Ingenierías at Conexión Tec	(Monterrey, Mexico)	2021-2023
19<u>th</u> IEEE-EMBS International Conference on BSN	(Boston, MA)	2023
NSF BRAIN Summer Annual IAB Meeting	(Phoenix, AZ)	2023
NSF BRAIN Summer Annual IAB Meeting	(Houston, TX)	2022
43<u>rd</u> Annual International Conference of the IEEE-EMBS	(Virtual)	2021

HONORS AND AWARDS

Outstanding Student Award (1% engineering trajectories), Tecnológico de Monterrey	2023, 2024
Student Speaker Award ($1600 USD), U21 Health Sciences Group	2024
1<u>st</u> Place - Undergraduate Student Paper Competition, 6<u>th</u> North American IEOM	2021
1<u>st</u> Place - R&D Improvement Proposals ($250 USD), 18<u>th</u> Conexión Tec	2021
Academic Talent Scholarship, 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
	FreeSurfer, FSL, MRtrix3, NiBabel, ANTs, PyDicom, IRTK, NUC, TochIO
Tools	Git, Anaconda, CUDA, CMake, Tableau, Microsoft Excel, G*Power, Overleaf, LaTeX
Platforms	Linux, Ubuntu, ROS, Windows, Arduino, Raspberry