

Milton O. Candela-Leal

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miltoncandela.github.io

EDUCATION

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| Tecnológico de Monterrey - Monterrey, Mexico | 2020 - Dec 2024 |
| BSc in Biomedical Engineering (94.5/100 = 3.8/4.0 GPA) | |
| International Baccalaureate - Monterrey, Mexico | 2018 - 2020 |
| Math HL, Psychology SL, Physics SL, ... | |
| Thesis: [Film & Psychology] <i>Harry Potter and the Prisoner of Azkaban</i> (2004), a Cultural and Ideological Instructor of the Millennial Viewer | |

RESEARCH EXPERIENCE

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| Harvard Medical School - Boston, MA, USA | 2023 - 2024 |
| <i>Boston Children's Hospital</i> | |
| Advisor: Prof. Kiho Im, PhD | |
| Projects: Fetal MRI subplate segmentation (attention U-Net), non-linear qMRI for congenital heart disease classification, VAE-GAN for anomaly detection. | |
| Tecnológico de Monterrey - Monterrey, Mexico | 2021 - 2023 |
| <i>NSF IUCRC BRAIN Center</i> | |
| 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. | |
| University of Houston - Houston, TX, USA | Spring 2022 |
| <i>NSF IUCRC BRAIN Center</i> | |
| Advisor: Prof. Jose L. Contreras-Vidal, PhD | |
| Project: EEG functional connectivity and bispectrum 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. doi:[10.3389/fnhum.2024.1319574](https://doi.org/10.3389/fnhum.2024.1319574). PubMed PMID:[38545515](https://pubmed.ncbi.nlm.nih.gov/38545515)
- 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](https://doi.org/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. doi:[10.3390/ijerph182211891](https://doi.org/10.3390/ijerph182211891). PubMed PMID:[34831645](https://pubmed.ncbi.nlm.nih.gov/34831645)

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](https://doi.org/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) [one of Mexico's top eight universities], 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. In *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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1109/IEEECONF53024.2021.9733770)

CONFERENCE PRESENTATIONS

Oral Presentations

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

Poster Presentations

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

HONORS AND AWARDS

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|---|------|
| Student Speaker Travel Award (\$1600 USD) - <i>U21 Health Sciences</i> | 2024 |
| 1 st Place - Undergraduate Student Paper Competition - <i>6th NA IEOM</i> | 2021 |

Tecnológico de Monterrey

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| Outstanding Student Award (top 1% best engineering trajectories) | 2023 |
| 1 st Place - R&D Improvement Proposals (\$250 USD) - <i>18th Conexión Tec</i> | Fall 2021 |
| Academic Talent Scholarship | 2020 |

TEACHING

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| German A2 Teacher - <i>Mentoor</i> | 2022-2024 |
| Middle School Math and Spanish Teacher - <i>Aprendamos Juntos</i> | 2021-2022 |
| Independent High School Physics Teacher | Fall 2019 |
| FIRST® LEGO® League Mentor - <i>Little Minds</i> | Spring 2019 |

SKILLS SUMMARY

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| 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, G*Power, Overleaf, \LaTeX |
| Platforms | Linux, Ubuntu, ROS, Windows, Arduino, Raspberry |