

# Milton O. Candela-Leal

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[miltoncandela.github.io](https://miltoncandela.github.io)

## EDUCATION

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

## RESEARCH EXPERIENCE

<b>Boston Children's Hospital</b> - Boston, MA, USA	Aug 2023 - Jul 2024
<i>Harvard Medical School</i>	
Advisor: Kiho Im, Ph.D.	
Project: <i>High-res Fetal Subplate Segmentation</i>	
<i>Unsupervised VAE-GAN for Anomaly</i>	
<i>Non-linear qMRI for CHD Classification</i>	
<b>NSF IUCRC BRAIN Center</b> - Monterrey, Mexico	Mar 2021 - Jul 2023
TMX BRAIN Site - <i>Tecnológico de Monterrey</i>	
Advisor: Mauricio A. Ramírez-Moreno, Ph.D.	
Project: <i>Advanced Learner Assistance System (ALAS)</i>	
<i>Talent and Passion Detection Through Biometrics</i>	
<i>Biomechanics for the Digital Twin</i>	
<i>Neurohumanities Lab</i>	
<i>Digital Twin of the Workspace</i>	
<b>NSF IUCRC BRAIN Center</b> - Houston, TX, USA	Spring 2022
UH BRAIN Site - <i>University of Houston</i>	
Advisor: Jose L. Contreras-Vidal, Ph.D.	
Project: <i>Brain on Acting</i>	

## 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 [\[paper\]](#)
- Candela-Leal, M.O.**, Gutiérrez-Flores, E.A., Presbítero-Espinoza, 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-Espinoza, 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 [\[paper\]](#)
- Candela-Leal, M.O.**, Alanis-Espinoza, 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

- 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. *15<sup>th</sup> 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 *6<sup>th</sup> North American Industrial Engineering and Operations Management (IEOM)* (pp. 2959-2970). Monterrey, Mexico: IEOM (**best undergraduate paper award**) [\[paper\]](#) [\[award\]](#)
- 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 [\[paper\]](#)
- Aguilar-Herrera, A.J., Delgado-Jimenez, E.A., **Candela-Leal, M.O.**, Olivas-Martínez, G., ... Ramírez-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 [\[paper\]](#)

## 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 [\[certificate\]](#) [\[slides\]](#)

## SELECTED 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 *19<sup>th</sup> IEEE-EMBS International Conference on Body Sensor Networks*, Boston, MA [\[poster\]](#)

## HONORS AND AWARDS

Outstanding Student Award (top 1% best engineering trajectories)	2023
1 <sup>st</sup> Place - Research and Improvement Proposals at 18 <sup>th</sup> Conexión Tec	Fall 2021
1 <sup>st</sup> Place - Undergraduate Student Paper Competition at 6 <sup>th</sup> NA IEOM	2021
Outstanding IB Extended Essay - 51 <sup>th</sup> Research and Development Congress	2021
Scholarship for Academic Talent - <i>Tecnológico de Monterrey</i>	2020
2 <sup>nd</sup> Place - Nuevo León State Chess Tournament (Youth Category)	2020

## TEACHING

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

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