Kareena L. Villalobos

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Education

Massachusetts Institute of Technology (MIT), Cambridge, MA — September 2018-May 2022

- B.S. in *Brain and Cognitive Sciences* / Minor in *Writing* : 4.6/5.0 GPA
- **Relevant Coursework:** Introduction to Data Science in Python, Introduction to Statistics and Probability, Neurocomputation, Artificial Intelligence, Machine Motivated Human Vision, Introduction to Programming, Multivariable Calculus

University of Texas Rio Grande Valley, Edinburg, TX — August 2016-July 2020

- Major in *Biology*, 3.96 GPA, 80 credit hours

Experience

Bella Vista Eye Care, *Optometric Assistant,* Pharr, TX — Jun 2016-July 2018 / January 2023-Present

- Facilitated communication between clinical staff and patients, accurately recording patient history and current complaints.
- Operated specialized equipment, such as the autorefractor, non-contact tonometer, and retinal imaging tools.
- Input information into the clinic's online healthcare records, contributing to efficient clinic operations.

Bioelectronics Lab - Brain and Gut Research, *Undergraduate Researcher,* Cambridge, MA — October 2021-May 2022

- Investigated molecular alterations in gut-brain axis of mouse models using advanced biochemistry laboratory techniques.
- Captured high-quality images via confocal microscopy for publication in conference materials and MIT Press news.

NASA TRISH Independent Research, *Undergraduate Researcher,* Remote — June 2020-Aug 2020

- Conducted a self-directed review of virtual health practices for healthcare applications in space and remote environments, highlighting ability to work independently and solve problems.
- Translated complex medical and technical information into easy-to-understand data points and summaries.

Radovitzky Lab - Helmet Design Research, *Undergraduate Researcher,* Cambridge, MA — September 2018-May 2019

- Designed and tested innovative helmets, reducing concussion impact force by 35% compared to conventional models.
- Collaborated on helmet manufacturing and trained fellow undergraduates on the detailed construction process.

Broad Institute of MIT and Harvard – Skin Microbiome Research, Cambridge, MA — June 2017-July 2017

- Investigated bacterial genomes in personal skin microbiomes and analyzed phylogenetic pathways using BLAST software.
- Delivered a professionally evaluated oral presentation at an MIT institute-wide symposium, demonstrating ability to effectively communicate data-related findings.

Course Projects

Art Classification Investigation in Transfer Learning

- Contributed to a research team focusing on the intersection of human and machine vision in art classification, using methods like transfer and few-shot learning of a pre-trained ResNet50 model on the Pandora7k database.
- Conducted human experiments via MTurk and analyzed data to compare the adaptive capabilities of machine vision and human subjects in painting classification tasks.
- Uncovered correlations between machine classification errors and low-level visual features, suggesting avenues for improving machine learning model performance in visual tasks.

EEG Data Analysis for Absence Epilepsy with Python

- Applied Python and NumPy to analyze EEG data, applying time series techniques, FFT, and spectral analysis for rhythmic brain activity detection.
- Computed periodograms, implemented frequency domain filtering, and produced spectrograms to assess dynamic spectrum changes.

Neural Network and Dimensionality Reduction with Python

- Developed a perceptron neural network for binary classification, deriving weight vectors analytically and through numerical simulations implementing perceptron learning rules.
- Applied Principal Component Analysis (PCA) for dimensionality reduction on a large neuronal dataset, enabling meaningful data visualizations and constructing a rudimentary neuronal activity decoder.

Certifications and Skills

Programming Languages: Python, SQL, Java, MATLAB, Excel — **Libraries:** NumPy, Matplotlib, SciPy, Pandas