

# Juan Muneton Gallego

☎ (401)588-0102 | @ muneton.juand@gmail.com |  LinkedIn |  GitHub |  Portfolio |

## EDUCATION

---

### Stanford University

*M.S Computational Mathematics and Engineering*

Palo Alto, CA

Sep 2023 – May 2025

### Brown University

*B.S Mathematical Statistics*

Providence, RI

Sep 2017 – May 2021

## WORK EXPERIENCE

---

### Adobe Research

*Research Scientist Intern*

San Jose, CA

Jun 2024 – Sep 2024

- Developed a linear-time self-attention mechanism using vector quantization for long-sequence data, achieving run-time performance comparable to HyperAttention.

### Adobe Inc.

*Machine Learning Engineer Intern*

Austin, TX

June 2023 – Sep 2023

- Established a data ingestion pipeline, utilizing SQL and the New Relic API, to curate a dataset tailored for machine learning training and inference purposes, specifically for Adobe Commerce health site monitoring.
- Developed deep Bayesian neural networks and regression-based models to predict website performance for Adobe Commerce site.
- Implemented an API microservice for serving Apdex score predictions.
- Developed modules for multi-collinearity analysis, outlier detection, and neural network regularization and training optimization.

### R-Dex Systems Inc.

*Machine Learning Engineer II*

Atlanta, GA

June 2022 – June 2023

- Built a background registration-based adaptive noise filtering system with robust principal component analysis via augmented Lagrange multipliers and Lucas-Kanade optical flow algorithm for image analysis.
- Engineered a module for designing generalized deep neural network architectures for complex numbers.
- Implemented neural network architectures with multi-frequency decomposition based on the Fast Fourier transform for temporal series classification of signal-based data.
- Investigated and implemented an intra-layer and class separability analysis of neural networks with the Henze Penrose statistic.

### R-Dex Systems Inc.

*Machine Learning Engineer I*

Atlanta, GA

June 2021 – June 2022

- Built a probabilistic Jacobian-based saliency map adversarial attack able to perform stochastic approximations for optimal pixel perturbation in large-dimensional datasets.
- Collaborated in the implementation of a transfer learning framework ‘learning without forgetting’ to increase model generalizability and training flexibility.
- Implemented a Jacobian-based data set augmentation to simulate black box attack modeling in Tensorflow.
- Designed a data pipeline to identify data distribution shifts in datasets with autoencoders, PCA, and ICA.
- Engineered variational autoencoders in Tensorflow and Pytorch to compute distributional distances with the Kolomogorov- Smirnov test, maximum mean discrepancy test, and Bures Wasserstein distance.
- Designed Bayesian convolutional neural networks to improve classification accuracy in hybrid and SOTA models.

### Nasdaq Machine Intelligence Lab

*Data Science Intern*

Boston, MA

May 2020 – Aug 2020

- Created and validated unsupervised clustering methods for optimizing financial time series portfolios, utilizing Scikit-Learn and incorporating in-house customizations for enhanced performance.
- Participated in the collaborative development and testing of automated Tensorboard visualizations, enabling real-time monitoring of agent training and evaluation on AWS EC2 instances.
- Integrated cluster embeddings into a temporal convolution neural network time series predictive framework
- Developed modules for error analysis and metrics, leveraging techniques such as multiple regression, statistical hypothesis testing, and clustering metrics.

## RESEARCH EXPERIENCE

---

### School of Public Health at Brown University

Providence, RI

*Undergraduate Researcher*

*Aug 2020 – May 2021*

- Honors Thesis: An Evaluation of Machine Learning Tools to Predict Survival Analysis in Patients Diagnosed with Breast Cancer: A Complete Case Analysis.
- Implemented Cox Regression Models, Support Vector Machines, Gradient Boosting Algorithms, and a Cox Neural Network model to compare accuracy in survival prediction.
- Thesis Advisor: Jon Steingrimsson.

### New York University Center for Neural Science

New York, NY

*Undergraduate Researcher*

*May 2019 – Aug 2019*

- Implemented data-driven and scientific methods to identify biomarkers of neural activity from EEG recordings. Analytical tools used: Independent Component Analysis (ICA), Power and Fourier Analysis, and Wavelet-Length Analysis.

### CLPS Department at Brown University

Providence, RI

*Undergraduate Researcher*

*Aug 2018 – Oct 2019*

- Curated EEG-signal data from Parkinson's Disease research study on cognitive control and reward prediction.

## AWARDS & ACHIEVEMENTS

---

**GEM Fellowship**, National GEM Consortium

*Fall 2023*

**HSF Scholar**, Hispanic Scholarship Fund

*Fall 2023*

**SMART Scholar**, US Department of Defense (DoD) (Declined)

*Fall 2023*

**Amazon MS Fellow**, Columbia University Engineering Fellowship and Amazon Inc. (Declined)

*Fall 2023*

**Departmental Honors**: Brown University

*Spring 2021*

**Sprint LINK Award**: Brown University Internship Award

*Spring 2020*

**LEDA Career Fellow**: Leadership Enterprise for Diverse America

*Summer 2019*

**Sydney Frank Scholar**: Brown University

*Fall 2017*

## PUBLICATIONS

---

*E. Eckels-Davidson, T. Davidson, A. Hübert, **J. Muneton Gallego**, R. Bock*, Distributional Distances: Using Statistical Tools to Assess and Inform Synthetic Data Generation, SPIE (2023) (In review).

***J. Muneton Gallego**, J. Steingrimsson* An Evaluation of Machine Learning Methods to Predict Survival of Patients Diagnosed with Breast Cancer, Undergraduate Honors Thesis at the School of Public Health at Brown University (2021).

***J. Muneton Gallego**, J. Windham, J. Zeldin*, Time Series Classification with HA-TCN for stress levels, Computer Science Department at Brown University (2020).

***J. Muneton Gallego**, D. Dvorak, A. Fenton*, Behind an Artist's Brain: an EEG-based Approach to Assessing Distinct Styles of Painting. Undergraduate Research Experience at NYU (NSF) (2019).

## PROJECTS

---

### Machine Learning System for Claim Validity | [GitHub](#)

- This project is a python-based module/package that provides a machine learning pipeline for training and querying claims from the pub-health dataset, which contains valid, false, mixed, and unknown claims. In this pipeline, we implemented 4 customized neural networks for natural language processing, all of which use an embedding layer.

### HA-TCN for Stress Levels | [GitHub](#)

- This project contains a Hierarchical Attentional-based Temporal Convolutional Neural Network (HA-TCN) capable of classifying levels of stress based on heart rate monitoring at different time-steps.

## SKILLS

---

**Programming**: Python, C++, JavaScript, MATLAB, R, SQL.

**Technologies**: Git, Docker, OpenCV, Pytorch, Tensorflow, Numba, scikit-learn, Linux ISE, Spark, CUDA, LaTeX.

**Mathematical Skills**: Real Analysis, Complex Analysis, Numerical Linear Algebra, Probability, Mathematical Statistics, Manifolds.

**Languages**: English and Spanish.

## RELEVANT COURSEWORK

---

**Graduate Relevant coursework:** Numerical Linear Algebra, Deep Generative Models, Real Analysis, Reinforcement Learning, Convex Optimization, Stochastic Process, Design and Analysis of Algorithms.

**Undergraduate Relevant coursework:** Data Structures and Algorithms, Statistical Learning, Deep Learning, Machine Learning, Probability Theory, Stochastic Optimization, Linear Optimization, Linear Algebra, Scientific Computing, Inference, Multivariate Calculus, Regression Analysis and Linear Models.