Julio Cesar Enciso-Alva, PhD

Arlington, TX, ZIP 76013
enciso.alva.jc@gmail.com
+1 817 405 8335
/julio-enciso-alva/
encisoalva.github.io

Applied Mathematician & Data Scientist

Motivated by intellectual challenges. Adapts easily. First-generation.

EXECUTIVE SUMMARY

- Certified in data handling: maintenance, visualization, analysis, modeling, prediction, and decision-making.
- Qualified to analyze, implement, and develop algorithms tailored for specific purposes.
- My definition of success is the practical capacity to help others.

KEY SKILLS

- Data engineering/analytics, math/statistical modeling, machine learning.
- Object-oriented programming, data management.
- Problem-solving, interdisciplinary research, written and oral communication.
- Leadership, mentoring, project development and deployment.
- Teaching, classroom, diversity in higher education.
- Graphic design, publication-quality and educational purposes.
- **Programming:** Matlab, Python, R, C++, MySQL, MS Office macros.
- **Software:** GNU Linux, MS Office, Tableau, Git, Jupyter, LaTeX, ggplot2, GeoGebra.
- **Libraries:** Sci-kit, PyTorch, Tensorflow, CUDA, Shiny (R).

EDUCATION

- [2024] **PhD. in General Mathematics**
  - University of Texas at Arlington @ Arlington, Texas, USA.
  - Dissertation: New Methods in EEG Source Localization based on EEG and Post-Mortem Pathology Data.
  - [2019-2024] Graduate Teaching Assistant.
  - [2024] Graduate Dissertation Fellowship.
  - [2023] Outstanding Graduate Student Researcher.
- [2023] **M.Sc. in General Mathematics**
  - University of Texas at Arlington @ Arlington, Texas, USA.
  - Degree awarded for credit completion.
- [2017] **B.S. in Applied Mathematics with a minor in Biology**
  - Universidad Autónoma del Estado de Hidalgo @ Pachuca, Hidalgo, Mexico.
  - Thesis: Weak Stationarity in Polysomnography Recordings of Older Adults as a Marker for Mild Cognitive Impairment.

CERTIFICATIONS

- Meta Database Engineer Specialization.
- IBM Data Engineering Professional Certificate.
- Google Data Analytics Professional Certificate.
- IBM Data Analytics with Excel and R Professional Certificate.

WORKSHOPS

- Grant Development and Management Workshop for Hispanic Serving Institutions.
- Strategies for Planning, Developing, and Writing Large Center Proposals.

LEADERSHIP AND MENTORING

- Student Organization Officer.
  - Society for Industrial and Applied Mathematics (SIAM) Graduate Student Chapter at UT Arlington.
  - [2021-2022] President.
  - [2020-2021] Vice-President.
  - Managed a bi-weekly research seminar. The average attendance was 12 graduate students.
  - Established *Mathposium Fair*, a department-wide research symposium. Estimated attendance was 70, 120, and 200 people in 2022, 2023, and 2024, respectively.
- Graduate Peer Mentor.
  - Supervised integration of mentees into the PhD program.
  - Successfully trained mentees for Preliminary Exams in Analysis and Linear Algebra.
  - List of mentees:
    - Olusola Dehinsilu.
    - Enoch Jesse Dangbe.
    - Emran Hossen.
- Co-mentor at Research Experience for Undergrads (REU) at two different iterations.
  - NSF-funded REU hosted UT Arlington.
  - Trained mentees in algorithm development and Matlab programming.
  - Research topic:
    - Measuring the degree of synchrony of EEG recordings during a cognitive task.
    - Optimization of parameters for simulations of EEG using genetic algorithms.

PROFESSIONAL AFFILIATIONS

- SIAM, Society for Industrial and Applied Mathematics.
- AMS, American Mathematical Society.
- MAA, Mathematical Association of America.
- SACNAS, Society for the Advancement of Chicanos and Native Americans in Sciences.

TEACHING

- Served as a Teaching Assistant (2 courses) and Instructor of Record (8 courses) at UT Arlington.
- Classes were introductory, including College Algebra (MATH 1301) and Preparation for Calculus (1421).
- Enrollment was approx. 50 students per section.

RESEARCH PROJECTS (SELECTED)

To decrease the effects of global warming, the USDA has implemented a series of research projects to optimize agriculture-related activities, including smart agriculture. By 2050, the goal is to increase US agricultural production by 40% while reducing its environmental footprint by half.

- Forecasting of mycotoxin outbreaks in corn farms in Texas.
  - Audit of forecast model: sensibility analysis with respect to inputs, robustness towards scale and sources of input data, extensibility to different weather conditions –to states other than Texas.
  - The forecast model is integrated into a publicly available dashboard to be launched in late 2025.

Electrical Source Imaging (ESI) is a neuroscience technique for locating neural sources of electrical activity that may be related to normal or pathological states, such as epilepsy.

- Non-invasive monitoring of ictal activity in infants with Glut deficiency.
  - By using ESI, the use of intracranial electrodes was avoided, resulting in a less invasive procedure.
- Evaluation of Virtual Electrodes (VEs) from ESI data.
  - VEs are simulations of hypothetical electrodes inside the brain constructed from ESI data.
  - Analysis of data from VEs and real intracranial electrodes lead to equivalent conclusions ($p<0.01$).
- Enhancement of ESI using pathology data (stroke approximate location).
  - Localization errors were reduced by 60% compared to ESI methods with similar runtime.

PRESENTATIONS (SELECTED)

- [Jan 2024] Joint Mathematics Meetings (JMM).
  - San Franciso, CA.
  - [Talk] New Methods in EEG Source Localization based on EEG and Post-Mortem Pathology Data.
- [Nov 2023] Mathposium Fair, UT Arlington.
  - Arlington, TX.
  - [Poster] New Methods in EEG Source Localization based on EEG and Post-Mortem Pathology Data.
- [Jun 2023] AIMS Conference on Dynamical Systems, Diff. Equations and Applications.
  - Wilmington, NC.
  - [Poster] Evaluation of Methods for fMRI-Informed Electrical Source Reconstruction from EEG.
- [Jan 2023] Joint Mathematics Meetings (JMM).
  - Boston, MA.
  - [Talk] Evaluation of Methods for fMRI-Informed Electrical Source Reconstruction from EEG.

* These presentations were possible thanks to awarded travel funding.

PUBLICATIONS

- Enciso-Alva JC.
  (2024). Expected Natural Density of Countable Sets after Infinitely Iterated de Finetti Lotteries, Computed via Matrix Decomposition.
  ArXiv, submit/5836682.
- Enciso-Alva JC, Dobariya A, Johnson TE, Mickey B, Pascual JM, Su J.
  (submitted). A Robust ECoG Source Localization Method Using Brain Data Analytics Validated by Pig Intracerebral Recordings.
  NeuroImage.
- Rajasekaran K, Ma Q, Good LB, Kathote G, Jakkamsetti V, Liu P, Avila A, Enciso-Alva JC, Markussen KH, Marin-Valencia I, Sirsi D, Hacker PMS, Gentry MS, Su J, Lu H, Pascual, JM.
  (2022). Metabolic modulation of synaptic failure and thalamocortical hypersynchronization with preserved consciousness in Glut1 deficiency.
  Science Translational Medicine, 14(665), eabn2956. DOI: 10.1126/scitranslmed.abn2956
- Rosales-Lagarde A, Rodriguez-Torres EE, Itzá-Ortiz BA, Miramontes P, Vázquez-Tagle G, Enciso-Alva JC, García-Muñoz V, Cubero-Rego L, Pineda-Sánchez JE, Martínez-Alcalá CI, Lopez-Noguerola JS.
  (2018). The Color of Noise and Weak Stationarity at the NREM to REM Sleep Transition in Mild Cognitive Impaired Subjects.
  Frontiers in Psychology, 9, 1205. DOI: 10.3389/fpsyg.2018.01205

I

LINK DUMP

- Personal site encisoalva.github.io/
- LinkedIn www.linkedin.com/in/julio-enciso-alva/
- GitHub github.com/EncisoAlva
- ORCiD orcid.org/0000-0002-8315-6849
- Google Scholar scholar.google.com/citations?hl=en&user=qqw6kegAAAAJ