MSc. Miguel Angel Soto Hernandez

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EDUCATION

PhD in Computer Science, Instituto Politécnico Nacional (IPN), Computing Research Center (*2023-2027*).
Development of a cognitive-conceptual learning model using Spiking Neural Networks (SNN). The aim was to create an effective Artificial Intelligence (AI) model for classification and extraction of relevant data, highlighting the inherent interpretability of the model.

Master in Computer Science, Instituto Politécnico Nacional (IPN), Computing Research Center (2021-2022).
Automatic hate speech detection with traditional artificial intelligence models (machine learning), using computational linguistics and hyperparameter search and optimization.

Project Management Diploma, Universidad Tecnológica de México (UNITEC) (2020).

Computer Engineering, Universidad Tecnológica de México (UNITEC) (2015-2019).

PROFESSIONAL EXPERIENCE

Web developer Jr - edivers Capacitación y Consultoría S.A. de C.V (2018-2019).

- Development of web pages with HTML, CSS, jQuery and Javascript based on client requirements.
- Creation of storage procedures, queries, registration/registration of users in MySQL databases.
- Normalization and administration of MySQL databases.

Full stack developer - IDCO DE HIDALGO, S.A. DE C.V. (Seasonal).
Development of an integrated management platform for company in the construction sector:

- I designed and implemented in Flutter Web the authentication and CRUD for users, works (locations) and staff allocation by date and location.
- I developed the daily tool allocation module with availability control and historical record in MongoDB.
- Implemented automatic credential generation from dynamic templates, including site validations and standard format download.
- Established the agile process of bi-weekly sprints: backlog refinement, definition of user stories with acceptance criteria and coordination of demos for validation.
- Coordinated with stakeholders the definition of formal requirements, reducing rework due to ambiguity by 60%.
- I collaborated in the design of the milestone billing plan and acceptance minutes, ensuring a stable cash flow.

RELEVANT PROJECTS

Homo-MEX 2024: Hate Speech detections towards mexican spanish LGBT+ population.
Developed a new dataset for the third subtask of the HOMO-MEX task, focused on detecting hate speech towards the LGBT population in music lyrics. This dataset is intended for the IberLEF 2024 competition, organized by the Spanish Society for NLP.

MiSonGyny 2025: Detection of misogyny against women in Spanish-language songs.
Created a new task for the IberLEF 2025 competition, focused on detecting misogyny against women in music lyrics.

LANGUAGES

English: B2.
Spanish: Native.

TECHNICAL SKILLS

IA and Data Analysis: Numpy, Scipy, Transformers, Tensorflow, Pandas, Scikit-Learn, Seaborn, Matplotlib.
Back-end: Node.js.
Multiplatform development: Flutter.
Databases: NoSQL (MongoDB), SQL.

CERTIFICATES

- SCRUM Foundation Professional Certificate (CertiProf) (2020).
- Complete Flutter App Development Bootcamp with Dart (Udemy) (2020).
- Data Science Orientation (Coursera) (2020).
- AWS Fundamentals: Going Cloud-Native (Coursera) (2020).
- Introduction to Data Analytics (Coursera) (2021).
- From Data to Insights with Google Cloud (Coursera) (2021).

ORGANIZATION AND PARTICIPATIONS

General Organization: Summer School in Computational Cognitive Sciences and Natural Language Processing. (edition 2023, 2024 and 2025).
Volunteer: Congreso Mexicano de Inteligencia Artificial 2023 (COMIA), Mexican International Conference in Artificial Intelligence 2023 (MICAI), IEEE Symposium Series on Computational Intelligence 2023 and SIMBig Conference.
Academic Comite: Congreso CORE 2023.

SCIENTIFIC PAPERS

- C. Macias, M. Soto, T. Alcántara, H. Calvo (2023). Impact of Text Preprocessing and Feature Selection on Hate Speech Detection in Online Messages Towards the LGBTQ+ Community in Mexico. IberLEF @ SEPLN.
- MA. Cardoso-Moreno, C. Macias, T. Alcántara, M. Soto, H. Calvo (2023). Convolving Emotions: A Compact CNN for EEG-Based Emotion Recognition. 2023 IEEE Symposium Series on Computational Intelligence (SSCI), 1472-1476.
- Macias, C., Soto, M., Calvo, H., & Valdez-Rodrıguez, J. E (2023). Identificación automática de divulgadores de noticias falsas mediante el perfilado de autor. Research in Computing Science 152, 127–138.
- Macias, C., Soto, M., Cardoso-Moreno, M. A., & Calvo, H (2023). Modeling the Depressive Mind: A Machine Learning Approach to Deciphering Beck's Cognitive Triad. Research in Computing Science.
- Macias, C., Soto, M., Cardoso-Moreno, M. A., & Calvo, H (2024). Modeling the depressive mind: An artificial intelligence approach to deciphering Beck's cognitive triad. Journal of Intelligent & Fuzzy Systems, JIFS-219333.
- H. Gómez-Adorno, G. Bel-Enguix, H. Calvo, S. Ojeda-Trueba, ST. Andersen, T. Alcántara, et al. (2024). Overview of HOMO-MEX at IberLEF 2024: Hate Speech Detection Towards the Mexican Spanish Speaking LGBT+ Population. Procesamiento del Lenguaje Natural 73, 393-405.
- M. Soto, C. Macias, M. Cardoso-Moreno, T. Alcántara, O. García, H. Calvo (2024). CogniCIC at EmoSpeech-IberLEF 2024: Exploring Multimodal Emotion Recognition in Spanish - Deep Learning Approaches for Speech-Text Analysis.

AFFILIATIONS

- IEEE Student Branch from Computing Research Center.
- Mexican Society on Artificial Intelligence (SMIA).

TEACHING EXPERIENCE

Professional Courses Instructor, IPN, Computing Research Center 2023-Present:

- **Natural Language Processing for beginners (2023 - present)**
- **From neuroscience to computing (2024)**
- **Machine Learning**