Edwin Puertas | Curriculum Vitae

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I am an AI Software Architect and NLP Researcher in computer science, currently serving as an Associate Professor at the Technological University of Bolivar (UTB) and a Senior Member of the IEEE. Throughout my academic and professional career, I have remained dedicated to staying up-to-date with the latest trends and developments in my field. This passion for continuous learning and innovation has been the driving force behind my success. I have extensive expertise in fundamental and emerging computer science areas, including Artificial Intelligence, Natural Language Processing, Big Data, Data Analytics, Software Engineering, and Programming Languages. My interdisciplinary approach to these topics has allowed me to make significant contributions to both the academic community and industry. Additionally, my dedication to actively participating in professional organizations both domestically and abroad reflects my values and desire to promote technological advancement and collaboration within the scientific community. I am strongly committed to enhancing my knowledge and skills, not only for personal growth but also to positively and meaningfully impact society. I strive to utilize my experience and expertise to benefit the community, through education and the creation of innovative technological solutions.

Interested Areas

- Artificial Intelligence (Deep Learning, Transfer Learning, Reinforcement Learning, etc.) with its Applications in Engineering.
- Data Analytics, Multi-Domain Signal Processing, Non-linear Time-Series Analysis.
- Sentimental Analysis, Text Classification, Author Profiling

Education

- **Ponitificia Universidad Javeriana** — **Bogotá, Colombia.**
  Doctor of Engineering — *2016–2023*
- **Universidad Tecnológica de Bolívar** — **Cartagena de Indias**
  Master in Engineering — *2008–2011*
- **Universidad Tecnológica de Bolívar** — **Cartagena de Indias**
  Bachelor in Engineering of Systems — *1995–2001*

Experience

- **Universidad Tecnológica de Bolívar** — **Cartagena de Indias**
  Associate Professor — *2008 — Present*

I specialize in implementing artificial intelligence projects across various industrial sectors, with a particular focus on Natural Language Processing, Data Analytics, and Big Data. Additionally, I innovate in software architectures by applying service-oriented computing and cloud computing. I have experience designing and implementing solutions using various programming languages, including Python, C#, Java, C++, and Julia, across different platforms and computing environments. In academia, I teach courses in Artificial Intelligence, Machine Learning, Big Data, Data Analytics, Software Architecture, and Data Science to both undergraduate and graduate students. My career combines technical practice with teaching, which allows me to stay up-to-date with the latest technology trends and contribute to the training of future technology professionals. I am dedicated to advancing my field and inspiring my students to become innovators and leaders in the technological world.

- **Center of Excellence in Ownership in Big Data and Data Analytic: CAOBA** **Bogotá**
  Senior Data Scientist *July 2016–July 2023*

  In my current position, I oversee artificial intelligence projects across various industrial sectors, with a particular focus on Natural Language Processing, Data Analytics, and Big Data. I explore and apply innovative software architectures, focusing on service-oriented and cloud computing. I have experience designing and implementing technology solutions using a range of programming languages and adapting to different computing platforms and environments. My career involves a synergy between advanced technical practice and teaching, which enables me to stay up-to-date with technology trends and contribute to the training of the next generation of technology professionals. I am dedicated to driving the development of my field, inspiring and empowering my students to become innovators and leaders in the dynamic world of technology.

- **Universitat Politècnica de València (UPV)** **Valencia, Spain**
  Student Research *Jan 2019 - Mar 2019*

  During this critical stage, my attention was solely focused on the progress of my research project. I participated actively in relevant scientific events, which not only enriched my knowledge but also provided me with the opportunity to collaborate with leading experts in my field. This participation was fundamental to the development and publication of innovative scientific papers. Additionally, I made significant efforts to identify and explore emerging areas of interest. This facilitated the creation of strong bilateral cooperation links, expanding the frontiers of my research and laying a foundation for future inter-institutional collaborations.

- **University of Turin** **Turin, Italy**
  Student Research *Oct 2018 –J an 2019*

  During this important phase of my career, I focused on enhancing my research work. By actively participating in scientific conferences and events, I not only gained a deeper understanding of advanced topics but also established valuable connections with other professionals in the field. This engagement was crucial for the development and publication of my research, which was well-received by the scientific community. In parallel, I identified and explored emerging areas of interest. This was instrumental in forging bilateral cooperative ties with researchers at the University of Turin. These collaborations enriched my academic perspective and opened avenues for future joint research and interdisciplinary projects. As a result, my professional network was strengthened, and knowledge in my area of expertise was advanced.

Awards

- Founding members to establish in the IEEE Colombian Caribbean Section.
- IEEE Senior Member
- IEEE Standards Association Member
- (Best Paper Award) Detection of Online Sexism Using Lexical Features and Transformer, In the 1st IEEE Colombian Caribbean Conference — C3, 2023.

Outreach Professional Associations

- IEEE Computer Society
- IEEE Computational Intelligence

- IEEE Standard Associations
- Association for Computational Linguistics - ACL

AI skills

AI Techniques (Advanced): Machine Learning, Deep Learning, Reinforcement learning
AI Techniques (Intermediate): Simple reasoning, logical symbol manipulation, ontology
NLP (Advanced): Author Profiling, Sentiment Analysis, Information retrieval
Computer Vision (Advanced): Object detection
APIs & Libarary (Advanced): NLTK, spaCy, TensorFlow, scikitlearn, Pandas, NumPy
Libarary (Intermediate): PyTorch, Keras, SciPy

Technical skills

Back-End Languages (Advanced): Python, C++, C#, Java
Back-End Languages (Intermediate): Julia, Scala, Prolog
Front-End Languages (Advanced): ASP.NET, JavaScript, HTML, XML , WSDL,
Database (Advanced): SQL Server, MySql, MongoDB
General (Advanced): DevOps, MLOps, GIT,

Complementary Training

- Course Artificial Intelligence for Information Retrieval and Extraction (Instructor Erik Cambria)
- XIII IBEROA-AMERICAN CONFERENCE ON ARTIFICIAL INTELLIGENCE
- Microsoft Technology Associate – Web Development Fundamentals
- Microsoft Technology Associate – Software Development Fundamentals
- Microsoft Technology Associate – Database Administration Fundamentals
- IC3 GS3 (Windows Vista/Office 2007): Living Online
- IC3 GS3 (Windows Vista/Office 2007): Computing Fundamentals
- IC3 GS3 (Windows Vista/Office 2007): Key Applications
- CompTIA StrataTM IT Fundamentals
- Working With ArcGIS Network Analyst
- Working With ArcGIS Network Spatial
- ArcGIS Desktop II: Tools and Functionality
- Introduction to Programming ArcObjects Using Microsoft .NET
- High-Performance Computing based on a National Grid through RENATA
- Teaching Skills Development Diploma
- SEMINAR SL-285 JAVA PROGRAMMING LANGUAGE WORKSHOP
- SL-285 JAVA PROGRAMMING LANGUAGE
- SEMINARY SL-275 JAVA PROGRAMMING LANGUAGE
- SL-110 FUNDAMENTALS OF THE JAVA PROGRAMMING LANGUAGE
- OO-226 OBJECT ORIENTED APPLICATION ANALYSIS AND DESIGN USING UML
- SL-275 JAVA PROGRAMMING LANGUAGE
- OBJECT-ORIENTED SOFTWARE DEVELOPMENT AT THE DEVELOPER LEVEL

Project

- **TrueShield** is a platform designed to combat the spread of fake news by analyzing and verifying the reliability of user-submitted information. Using a structured process, it identifies key entities, cross-references data from sources like RSS, Twitter, and Reddit, and generates a veracity score based on

advanced algorithms. Built on a scalable microservices architecture, it features a client interface in Angular, a Django backend, and FastAPI-powered APIs integrated with AI models from Hugging Face for tasks such as entity recognition and inference analysis. Deployed using modern tools like Docker, Terraform, and Ansible on AWS, TrueShield empowers users to evaluate the authenticity of information, fostering a transparent and trustworthy digital ecosystem.

- **FrameLens** is a methodology using natural language processing (NLP) to analyze how news is framed in Spanish media. The study addresses the lack of research in Spanish-language media dynamics by identifying cultural and political factors that shape news narratives. The study processes and categorizes news content through advanced NLP techniques to highlight specific framing strategies. The findings reveal significant variability in framing categories, demonstrating the complexity of media narratives across different linguistic environments. This research enhances linguistic inclusivity in framing studies and contributes to a more comprehensive understanding of global media. The results have practical implications for improving media literacy and public opinion analysis. In conclusion, the study provides innovative tools for cross-linguistic media analysis, emphasizing the importance of considering linguistic diversity in media studies.
- **MentalGuard**: is a project that proposes a multimodal approach using artificial intelligence for the early detection of mental health risks in university students. The study focuses on overcoming the limitations of traditional assessment tools, which rely on personal interactions with mental health professionals and can be influenced by perceived stigma and subjectivity. The proposal integrates advanced natural language processing techniques to analyze linguistic patterns in text and audio, offering a more objective, rapid, and scalable evaluation of risk indicators. The expected outcomes include improved diagnosis and early intervention, with practical applications in designing personalized rehabilitation programs and assistive technologies. Additionally, the importance of early detection is emphasized to prevent the exacerbation of mental health issues that can affect academic performance and overall student well-being. In conclusion, the study presents an innovative perspective for addressing mental health in academic settings through the use of emerging technologies and cognitive approaches.
- **Mapping Motion**: is a project that explores a cognitive approach to analyzing the movements of individuals with dyspraxia, a developmental coordination disorder. Movement data is captured and processed using a motion mapping system through advanced signal processing techniques. The study identifies and quantifies characteristic movement patterns in individuals with dyspraxia, which differ from typical movements. These findings can improve diagnosis and therapeutic interventions. Additionally, the results have practical applications in designing personalized rehabilitation programs and assistive technologies. The cognitive approach and motion mapping system provides researchers and healthcare professionals with valuable new tools. In conclusion, the study offers an innovative perspective for analyzing and treating dyspraxia.
- **Automated Traffic Monitoring System in Urban Areas**: An energy production company expanded its technological horizons by developing an innovative solution to improve traffic enforcement in urban pedestrian areas. The project focused on addressing the challenge of unauthorized vehicle entries, including motorcycles and other vehicles, which compromise pedestrian safety. [Start: January 2023 End: Actually]
- **Apollo: Illuminating the Path of Multimodal Understanding with Vision, Text, and Audio**: Apollo is a Python package that provides three different channels: Audio (Lyre), Text (Pythia) and Vision (Argus), making it faster to develop complex apps with other services and utility functions for all three channels at once. In addition to this, we provide our models into the scene for text processing and Syllabification which is one of the strengths of the package, the vision part is composed of various tools such as Head Analysis, Part Indices, and more for a complete diagnostic in motor patterns, facial movements and statistical analysis. [Start: October 2023 End: Actually]
- **Enhancing ROI Predictions for Photovoltaic Systems through Advanced Degradation Modeling**: A team of researchers from the Universidad Tecnológica de Bolívar developed an innovative approach to accurately calculate the Return on Investment (ROI) for photovoltaic (PV) systems. This method uniquely incorporates system degradation and maintenance factors, providing a more realistic ROI estimation.[Start: January 2023 End: December 2023]
- **PhD Thesis** Analysis of phonetic and emotional elements to predict polarity in microblogging sources.[Start: July 2016 End: Dic 2022]
- **Development of Dissemination Pattern Models**: Development and improvement of mathematical and

epidemiological models of the SARSCoV-2 epidemic in Colombia.[Start: July 2020 End: April 2021]

- **Listen to the Customer**: To determine the level of satisfaction and the main trends in the customer service process using sentiment analysis of information collected through Nutresa's customer management processes.[Start: July 2019 End: May 2020]
- **ABC2**: The project developed a tool to support the decision-making process in sales, promotions, and customer service for the brand of Services Nutresa, El Corral. The product consists of an analytical tool that from techniques of Artificial Intelligence applied to several data sources presents to the user several important findings that can be used for the improvement of internal processes. [Start: January 2019 End: July 2019]
- **Textolítica**: Several modules were developed that allow the performance of natural language processing tasks on conversations between Bancolombia's customers and the analysts in charge of Customer Service. This analysis is made through statistical techniques, artificial intelligence, and Big Data that allow us to have a better understanding of the main topic of discussion in the processed texts and an analysis of feelings of it. [Start: January 2018 End: December 2018]
- **Digital Segmentation**: The general purpose of the project consisted in identifying relevant features of the group of Colombian consumers of the Nutresa Group, in the social network Twitter, which led to identifying demographic, psychological, and behavioral features such as tastes and preferences differentiated by geographical distributions, habits, lifestyles, values, and needs of the population.[Start: July 2016 End: December 2017]
- **Service Oriented Business Integration: Small and Medium Enterprises**: The purpose of this work was to develop an application integration model using Service Oriented Architecture. This model allows the integration of heterogeneous environments and heterogeneous systems, such as interfaces, operating systems, communication protocols, and programming languages, among others.[Start: June 2009 End: December 2011]
- **Integrated Authentication System — my UTB**: This project allowed UTB users to access multiple services, or application systems, from a single authentication system. The process of an SSO requires the user to log in through a portal only once at the beginning, and then during the session, the SSO system transparently provides the user with access to the different services, resources, or applications of the system that are assigned, without requesting a login form again unless the user logs out.[Start: February 2015 End: December 2015]

Reference

Work

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Publications

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