

Carlos Minutti

Curriculum Vitae

✉ cminutti@data-fusionlab.com
in [carlos-minutti](#)

Experienced Data Scientist and Researcher with expertise in Statistical Modeling, Machine Learning, Big Data Analytics, and Programming. Proven experience in academia, industry, and government projects, with a focus on Artificial Intelligence and Data Science.

Education

- 2015-2020 **PhD in Computer Science**, *National University of Mexico*, Field: Scientific Computing, Optimization, Machine Learning, Data Science, Institute of Research in Applied Mathematics and Systems
Cum Laude
- 2017-2018 **Research Internship**, *University of Waterloo*, Field: Scientific Computing and Optimization, Canada
- 2011-2013 **Master's in Applied Mathematics**, *National University of Mexico*, Field: Statistics, Probability, and Scientific Computing, Institute of Research in Applied Mathematics and Systems
- 2003-2007 **Bachelor in Statistics**, *University of Chapingo*, Department of Statistics, Mathematics, and Computing

Experience

- 2024- **Research Scientist and Professor at the Center for Research and Innovation in Information and Communication Technologies (INFOTEC)**, *Research in Data Science and Artificial Intelligence applications, and professor for the Master and PhD programs in Data Science, INFOTEC*, <https://www.infotec.mx>
- 2022-2024 **Postdoctoral researcher working on the use, classification and analysis of medical images using artificial intelligence methods to identify health problems.**, *CECAv - UNAM*, <https://cecav.unam.mx>
- 2021-2022 **Researcher associated at the Interdisciplinary Professional Unit in Engineering and Advanced Technologies at the National Polytechnic Institute (Mexico)**, *UPIITA - IPN*, <https://www.upiita.ipn.mx>
- 2022-2022 **Lecturer in the Data Science undergraduate program at the National Autonomous University of Mexico, for the subject "Time Series"**, *UNAM*, <https://cienciadatos.iimas.unam.mx/>
- 2022-2022 **Lecturer in the master's program in Data Science at the Center for Research and Innovation in Information and Communication Technologies, for the subject "Web Analytics"**, *INFOTEC*, <https://www.infotec.mx/MCDI/>
- 2020-2021 **Researcher associated at the Artificial Intelligence Consortium for the National Council of Science and Technology (Mexico), with the project: Automated prediction of air pollutant concentrations in the Mexico City area using Artificial Intelligence.**, *CONACyT*, <https://www.consorcioia.mx>

- 2020 **Software developer for Mayaf, an automated software for Pressure Transient Analysis (PTA) in well testing**, *Mayaf software*, <https://mayaf-software.com/>
- 2016-2020 **Developer of a machine-learning method to predict defaults for loans to small and medium enterprises**, *Fintech: Proyecto-PyME*, <http://proyecto-pyme.com/>
- 2017-2018 **Research project at the University of Waterloo to develop an hydraulic tomography algorithm**, *Earth and Environmental Sciences*, University of Waterloo, Canada
- 2015-2016 **Principal statistical consultant and analyst at the project: “National survey of perception and knowledge on climate change in Mexico”**, *Collaboration Platform on Climate Change and Green Growth Between Canada and Mexico*, National Institute of Ecology and Climate Change, INECC-PNUD
- 2014 **Data base validation in the reconstruction of the 1930 Mexican Census**, *National Institute of Statistics and Geography*, INEGI
- 2013 **Programmer of the software get-yahoo-db**, <http://code.google.com/p/get-yahoo-db/>
- 2013-2014 **Research project: Characterization of Natural Fractured Vuggy Oil Reservoirs**, *The National Mexican Petroleum Company and The Secretariat of Energy*, CONACYT-SENER
- 2012 **Platform development for the reconstruction of the 1930 Mexican Census**, *National Institute of Statistics and Geography*, INEGI
- 2008-2019 **Statistical consultant and data scientist at Minnova Consulting**, <http://minnova-consulting.com>

Languages

Spanish Native
English Advanced

Software and programming

OS	Gnu/Linux (Gentoo, Slackware, Ubuntu), MS-Windows (XP, NT, Vista, 7, 10), MS-DOS, Mac OS X.	Graphics	The GIMP 2.8, Blender, Inkscape.
Office	Microsoft Office (Word, PowerPoint, Excel, Access), LibreOffice.	Publishing	L ^A T _E X, Scribus.
Programming	C/C++, Fortran+MPI, Python, Bash Scripting.	Web	HTML, PHP, JavaScript, XML, AWS.
Scientific programming	R 4.0, SAS V9, Minitab 15, Splus, SPSS 16, STATA 10, JMP 8, Octave, Matlab, SciLab, Maxima. Python (NumPy, SciPy, Pandas, PyTorch).	Data bases	MySQL, SQLite, Access.

Publications

- C. Minutti-Martinez, M. F. Mata-Rivera, M. Arellano-Vazquez, B. Escalante-Ramírez, J. Olveres. “**Air Pollution, Socioeconomic Status, and Avoidable Hospitalizations: A Multifaceted Analysis**”. *Mathematical and Computational Applications*, 30(4), 69. (2025).

- M. Arellano-Vazquez, M. Zamora-Machado, M. Robles Pérez, C. Minutti-Martinez, M. O. Jaramillo Salgado. **“Dynamic Wind Condition Detection in Baja California, Mexico: A Machine Learning Approach for Improved Wind Management”**. IEEE Latin America Transactions, 23(5), 387–396. (2025).
- C. Minutti-Martinez, M. F. Mata-Rivera, M. Arellano-Vazquez, B. Escalante-Ramírez, J. Olveres. **“Air Pollution, Socioeconomic Status, and Avoidable Hospitalizations in Mexico City: A Multifaceted Analysis”**. Lecture Notes in Computer Science, Springer, Cham. (2025).
- C. Minutti. **“Unraveling the Complex Interplay Between Socioeconomic Status, Air Pollution, and Heart Disease Hospitalizations in an Urban Population”**. Proceedings of the 21st International Conference on Electrical Engineering, Computing Science and Automatic Control (CCE). (2024).
- R. Carrillo, C. Minutti, P. Lagunes. **“A Comprehensive Methodology for Performing Continued Process Verification”**. IEEE 37th International Symposium on Computer-Based Medical Systems (CBMS). (2024).
- C. Minutti-Martinez, B. Escalante-Ramírez, J. Olveres-Montiel. **“Enhancing Interpretability and Bias Control in Deep Learning Models for Medical Image Analysis Using Generative AI”**. Proceedings of SPIE. (2024).
- C. Minutti-Martinez, B. Escalante-Ramírez, J. Olveres-Montiel. **“PumaMedNet-CXR: An Explainable Generative Artificial Intelligence for the Analysis and Classification of Chest X-Ray Images”**. Lecture Notes in Computer Science, Springer, Cham, vol 14392, pp. 211–224, 2023.
- C. Minutti-Martinez, A. Galindo, L. F. Valdez-Garduño and M. F. Mata-Rivera, **“Exploring nonlinear effects of air pollution on hospital admissions by disease using gradient boosting machines”**. 19th International Conference on Electrical Engineering, Computing Science and Automatic Control (CCE). pp. 1-6. IEEE. 2022.
- C. Minutti-Martinez, M. Arellano-Vázquez, M. Zamora-Machado **“A Hybrid Model for the Prediction of Air Pollutants Concentration, Based on Statistical and Machine Learning Techniques”**. Lecture Notes in Computer Science, Springer, Cham, vol 13068, pp. 252–264, 2021.
- C. Minutti, W. A. Illman and S. Gomez. **“A New Inverse Modeling Approach for Hydraulic Conductivity Estimation Based on Gaussian Mixtures”**. Water Resources Research, 56, e2019WR026531. 2020.
- M. Arellano-Vazquez, C. Minutti-Martinez and M. Zamora-Machado. **“Automated Characterization and Prediction of Wind Conditions Using Gaussian Mixtures”**. Lecture Notes in Computer Science, Springer, Cham, 12468, pp. 1-11, 2020.
- C. Minutti, G. Ramos and S. Gomez. **“An Algorithm for Hydraulic Tomography Based on a Mixture Model”**. (Computational Science - ICCS 2019. Lecture Notes in Computer Science, vol 11538. Springer, Cham. 2019.
- C. Minutti, G. Ramos and S. Gomez. **“A machine-learning approach for noise reduction in parameter estimation inverse problems, applied to characterization of oil reservoirs”**. Journal of Physics: Conference Series. 2018.
- G. Ramos, J. Carrera, S. Gomez, C. Minutti and R. Camacho. **“A stable computation of log-derivatives from noisy drawdown data”**. Water Resour. Res., 53, 7904–7916. 2017.

- C. Minutti, G. Ramos and S. Gomez. **“Robust Characterization of Naturally Fractured Carbonate Reservoirs through Sensitivity Analysis and Noise Propagation Reduction”**. SPE-181182-MS. SPE Latin America and Caribbean Heavy and Extra Heavy Oil Conference, 19-20 October, Lima, Peru. 2016.
- Francisco J. Zamudio, Roxana I. Arana, Javier Jimenez, Carlos Minutti, Javier Santibanez, Robert McCaa. **“Muestreo Probabilístico para la Recuperación de los Microdatos del Censo General de Población de 1930”**. Instituto Nacional de Estadística y Geografía, 2015.
- R. Camacho-V, N. Fuenleal-M, T. Castillo-R, S. Gómez, G. Ramos, C. Minutti-M, M. Vásquez-C, A. Mesejo. G. Fuentes-C. **“Avances en la caracterización integral de un yacimiento naturalmente fracturado vugular, el caso Ayatsil-Tekel”**. Ingeniería Petrolera. VOL. 54, No. 10, Octubre 2014
- R. Camacho-V, S. Gómez, M. Vásquez-C, N. Fuenleal-M, T. Castillo-R, G. Ramos, C. Minutti-M, A. Mesejo, G. Fuentes-C. **“Well Testing Characterization of Heavy-Oil Naturally Fractured Vuggy Reservoirs”**. SPE-171078-MS. SPE Heavy and Extra Heavy Oil Conference: Latin America, 24-26 September, Medellín, Colombia. 2014.

International Conferences

- C. Minutti. **“Cyclo-VGAE: Dual-Mechanism Approach to GNN Robustness Against Noisy Labels”**. International Joint Conference on Neural Networks (IJCNN) 2025. Rome, Italy. (2025).
- C. Minutti. **“Unraveling the Complex Interplay Between Socioeconomic Status, Air Pollution, and Heart Disease Hospitalizations in an Urban Population”**. 21st International Conference on Electrical Engineering, Computing Science and Automatic Control (CCE). Mexico City, Mexico. (2024).
- C. Minutti. **“Air Pollution, Socioeconomic Status, and Avoidable Hospitalizations in Mexico City: A Multifaceted Analysis”**. 6th Workshop on New Trends in Computational Intelligence and Applications. INAOE, Puebla, Mexico. (2024).
- C. Minutti. **“Enhancing interpretability and bias control in deep learning models for medical image analysis using generative AI”**. SPIE Photonics Europe 2024. Strasbourg, France. 7-11 April. (2024).
- C. Minutti. **“PumaMedNet-CXR: An Explainable Denoising Autoencoder for the Analysis and Classification of Chest X-Ray Images”**. 22th Mexican International Conference on Artificial Intelligence, 13-18 November, IIMAS-UNAM (UAHY) - UADY, Mérida, Yucatán, México. 2023.
- C. Minutti. **“Exploring nonlinear effects of air pollution on hospital admissions by disease using gradient boosting machines”**. 19th International Conference on Electrical Engineering, Computing Science and Automatic Control (CCE), Mexico City, Mexico. 2022.
- C. Minutti. **“Automated Prediction of Air Pollutant Concentrations in Mexico City, Using Artificial Intelligence Methods”**. 20th Mexican International Conference on Artificial Intelligence, 25-30 October, Mexico City, Mexico. 2021.
- C. Minutti. **“An algorithm to perform hydraulic tomography based on a mixture model”**. International Conference on Computational Science, 12-14 June, Faro, Algarve, Portugal. 2019.

- C. Minutti. “**An approach for noise reduction in inverse problems, applied to well-test data**”. 9th International Conference on Inverse Problems in Engineering, May 23-26, University of Waterloo, ON, Canada. 2017.
- C. Minutti. “**A Methodology for the Characterization of Naturally Fractured-Vuggy Carbonate Reservoirs Using Statistical Methods**”. Eighth International Conference “Inverse Problems: Modeling and Simulation”, May 23-28, Ölüdeniz, Fethiye, Turkey. 2016.

Awards and distinctions

- 2025 **Second Place in the Natural Language Processing (NLP) Competition**, *"Researching Sentiment Evaluation in Text for Mexican Magical Towns" (Rest-Mex 2025) at the Iberian Languages Evaluation Forum (IberLEF) 2025*, IberLEF, Spain
- 2025 **First Place in the "Learning with Noisy Graph Labels Competition"**, *At the "International Joint Conference on Neural Networks 2025" of The International Neural Network Society (INNS)*, IJCNN, Rome, Italy
- 2024 **AFIRME-FUNAM award**, *3rd Place in the research category of the AFIRME-FUNAM award, which has the purpose of promoting and recognizing scientific research in the areas of Physical-Mathematical Sciences and Engineering through the National University of Mexico and AFIRME Financial Group*, UNAM Foundation, Mexico
- 2024 **INFOTEC-HUAWEI AI 1000 Talent Development Program Awardee**, *Out of 1000 participants, the AI 1000 program rewards the top 100 Huawei HCIA-AI certification results with a 2-week AI training program at Huawei's facilities in Hangzhou, China*, HUAWEI, China
- 2023 **1st Place in the the Best Paper Award at the 22nd Mexican International Conference on Artificial Intelligence**, *The Mexican Society for Artificial Intelligence*, https://doi.org/10.1007/978-3-031-47640-2_18, Mexico
- 2023 **Member of the National System of Researchers (SNI), Level C**, *Interdisciplinary Area*, <https://conacyt.mx/sistema-nacional-de-investigadores/>, Mexico
- 2021 **Top 3% (Silver medal) in the Kaggle competition: Google Smartphone Decimeter Challenge**, *Ranked in the top 3% of the Data science / AI competition "Google Smartphone Decimeter Challenge", with 810 teams and 985 competitors from around the world*, <https://www.kaggle.com/c/google-smartphone-decimeter-challenge>
- 2017 **Scholarship recipient of the Emerging Leaders in the Americas Program**, *The scholarship provide students from Latin America and the Caribbean with short-term exchange opportunities for study or research, in Canada*
- 2016 **Second place for the best master's thesis in statistics**, *National prize by the Mexican Association of Statistics (AME)*, The Francisco Aranda-Ordaz Prize