Nahuel **Costa Cortez**
Assistant Professor in Machine Learning

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Gijón (Spain), 33204
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Research interests
Prognostics & Health Management
Generative AI
Domain Adaptation
Survival prediction
Explainable & Interpretable AI
Conformal Prediction
LLMs/VLMs and RAG

Fields of application
Biomedical
ECG
Medical imaging (fPET/X-Ray)
Industrial
Lithium-ion Batteries
Aircraft Engines
Industrial Fans

Computer Skills
Proficient with Python,
Java,
C++,
C,
Matlab,
LaTeX

Links
👤 nahuelcosta.com
🐙 NahuelCostaCortez
in nahuel-costa-cortez
🎓 mrdKa3EAAAAJ&hl

Languages
English and Spanish

Research Experience

Assistant Professor	University of Oviedo	**September 2023-Now**

Computer Science Department
Computer Science & Artificial Inteligence

Lecturer	University of Oviedo	**2021-2023**

Computer Science Department
Languages and computer systems

Visiting Professor	University of Alberta	**May-July 2025**

Department of Computing Science
Research of multimodal analysis in cardiovascular problems

Visiting Researcher	CEU San Pablo University	**Jan-March 2025**

USP CEU Polytechnic School of Engineering
Diagnosis and interpretation of electrocardiograms using advanced Machine Learning techniques

Visiting Researcher	University of Montpellier	**May-July 2023**

Laboratoire d'informatique, de robotique et de microélectronique de Montpellier
Research and development of medical diagnostic methods based on emission tomography images

Visiting Researcher	University of Hawaii at Manoa	**May-August 2022**

Hawaii Natural Energy Institute
Research and development of Machine Learning tools for the diagnosis and prognosis of lithium-ion batteries

Research Assistant	University of Oviedo	**2019-2021**

Metrology and Modeling Lab
Development of computational health models for the treatment of rechargeable batteries

Research intern	University of Oviedo	**2019-2020**

Metrology and Modeling Lab
Analysis of intracardiac electrocardiograms for the prediction of cardiovascular diseases

Education

PhD Machine Learning	University of Oviedo	**2020-2023**
MA Computer Science	University of Oviedo	**2019-2020**
BA Computer Science	University of Oviedo	**2015-2019**

Projects

NAC-ES-PUB-ASV-2025 PCI2025-163245	2025-Now

GEOAI-Based Augmentation of Multi-source Urban GIS
Team member

SEK-25-GRU-GIC-24-055	2025-Now

Intelligent Computing For Disruptive Data
Team member

MCINN-24-PID2023-146257OB-I00	2025-Now

Sustainable Computing in Limited Information Scenarios
Team member

MDSC-24-2024D179-Agenda2030	2025-Now

Observatory for the Implementation of the 2030 Agenda in the Spanish University System
Team member

UO-177745	2024-2025

Automated Moodle quiz creation and optimization using learning analytics, application to learning programming languages
Team member

PID2022-141792OB-I00	2022-Now

Accurate estimation of health status and remaining life in advanced lithium-ion technologies
Collaborating researcher

FUO-354-23, TOTAL ENERGIES	2022-Now

Artificial Intelligence applied to Data Analysis and Process Modeling
Team member

MCI-21-PID2020-112726RB-I00	2021-2024

Computational intelligence for emissions mitigation: new learning methodologies with incomplete data
Team member

FUO-231-22, TALLERES ZITRÓN, S.A.	2022-2023

Intelligent and explainable condition monitoring of jet fans
Team member

FC-GRUPIN-IDI/2018/000226	2019-2020

Data engineering applied to eco-efficient energy management (IDAGEE)
Collaborating researcher

Publications

Journal articles

Addressing data scarcity in industrial reliability assessment with Physically Informed Echo State Networks
Luciano Sánchez, **Nahuel Costa**, *Inés Couso*,
Reliability Engineering System Safety(2025), DOI:10.1016/j.ress.2025.111135

Few-shot generative compression approach for system health monitoring
Nahuel Costa, *Luciano Sánchez*,
Reliability Engineering System Safety(2025), DOI:10.1016/j.ress.2024.110749

Data imputation in the frequency domain using Echo State Networks
Luciano Sánchez, **Nahuel Costa**, *Inés Couso*,
Engineering Applications of Artificial Intelligence(2025), DOI:10.1016/j.engappai.2025.110129

Integrating imprecise data in generative models using interval-valued Variational Autoencoders
Luciano Sánchez, **Nahuel Costa**, *Inés Couso, Olivier Strauss*,
Information Fusion(2024), DOI:10.1016/j.inffus.2024.102659

ICFormer: A Deep Learning model for informed lithium-ion battery diagnosis and early knee detection
Nahuel Costa, *David Anseán, Matthieu Dubarry, Luciano Sánchez*
Journal of Power Sources (2024), DOI:10.1016/j.jpowsour.2023.233910

Remaining Useful Life Estimation Using a Recurrent Variational Autoencoder
Nahuel Costa, *Luciano Sánchez*
Logic Journal of the IGPL (2024), DOI:10.1093/jigpal/jzae023

Learning remaining useful life with incomplete health information: A case study on battery deterioration assessment
Luciano Sánchez, **Nahuel Costa**, *José Otero, David Anseán, Inés Couso*
Array (2023), DOI:10.1016/j.array.2023.100321

Physics-informed learning under epistemic uncertainty with an application to system health modeling
Luciano Sánchez, **Nahuel Costa**, *José Otero, Inés Couso*
International Journal of Approximate Reasoning (2023), DOI:10.1016/j.ijar.2023.108988

Simplified models of remaining useful life based on stochastic orderings
Luciano Sánchez, **Nahuel Costa**, *Inés Couso*
Reliability Engineering & System Safety (2023), DOI:10.1016/j.ress.2023.109321

Data-Driven Diagnosis of PV-Connected Batteries: Analysis of Two Years of Observed Irradiance
Matthieu Dubarry, Fahim Yasir, **Nahuel Costa**, *Dax Matthews*
Batteries (2023), DOI:10.3390/batteries9080395

Data-driven direct diagnosis of Li-ion batteries connected to photovoltaics
Matthieu Dubarry, **Nahuel Costa**, *Dax Matthews*
Nature Communications (2023), DOI:10.1038/s41467-023-38895-7

Li-ion battery degradation modes diagnosis via Convolutional Neural Networks
Nahuel Costa, *Luciano Sánchez, David Anseán, Matthieu Dubarry*
Journal of Energy Storage (2022), DOI:10.1016/j.est.2022.105558

RUL-RVE: Interpretable assessment of Remaining Useful Life
Nahuel Costa, *Luciano Sánchez*
Software Impacts (2022), DOI:10.1016/j.simpa.2022.100321

Variational encoding approach for interpretable assessment of remaining useful life estimation
Nahuel Costa, *Luciano Sánchez*
Reliability Engineering & System Safety (2022), DOI:10.1016/j.ress.2022.108353

Semi-Supervised Recurrent Variational Autoencoder Approach for Visual Diagnosis of Atrial Fibrillation
Nahuel Costa, *Luciano Sánchez*
IEEE Access (2021), DOI:10.1109/ACCESS.2021.3064854

Graphical Analysis of the Progression of Atrial Arrhythmia Using Recurrent Neural Networks
Nahuel Costa, *Jesús Fernández, Inés Couso, Luciano Sánchez*
International Journal of Computational Intelligence Systems (2020), DOI: 10.2991/ijcis.d.200926.001

Conference and workshop papers

Automated generation of python programming multiple choice questions using reflection and metaprogramming
José Otero, **Nahuel Costa**
ICERI (2024), ICERI

Rapidae: A Python library for creation, experimentation, and benchmarking of Autoencoder models
Nahuel Costa, *Luciano Sánchez*
IEEE World Congress on Computational Intelligence, 2024, YOKOHAMA, Japan

Cities Datalex: software de acceso inteligente a la normativa de desarrollo urbano y territorial sostenible
Maria Rosario Alonso, Luciano Sánchez, **Mari Cruz Rozada**, **Joaquín Meda**, **Nahuel Costa**
XI Congreso Internacional de Ordenación del Territorio CIOT, Gijón

Enhancing Time Series Anomaly Detection Using Discretization and Word Embeddings
Lucas Pérez, **Nahuel Costa**, *Luciano Sánchez*
International Conference on Soft Computing Models in Industrial and Environmental Applications (SOCO), 2023, Salamanca, Spain, DOI: 10.1007/978-3-031-42536-3_26

Weakly supervised learning of the motion resistance of a locomotive powered by liquefied natural gas
Luciano Sánchez, Pablo Luque, Daniel Álvarez-Mántaras, José Otero, **Nahuel Costa**
International Workshop on Soft Computing Models in Industrial and Environmental Applications (SOCO), 2022, Salamanca, Spain, DOI: 10.1007/978-3-031-18050-7_59

Nahuel **Costa Cortez** , Phd

Informed Weak Supervision for Battery Deterioration Level Labeling
Luciano Sánchez, **Nahuel Costa**, *David Anseán*
International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems (IPMU), 2022, Milano, Italy, DOI: 10.1007/978-3-031-08974-9_59

Explainable condition monitoring from imprecise information
Nahuel Costa, *Luciano Sánchez*
Conference of the Spanish Association of Artificial Intelligence (CAEPIA), 2021, Málaga, Spain

Remaining Useful Life Estimation Using a Recurrent Variational Autoencoder
Nahuel Costa, *Luciano Sánchez*
International Conference on Hybrid Artificial Intelligence Systems (HAIS), 2021, Bilbao, Spain, DOI: 10.1007/978-3-030-86271-8_5

Graphical analysis of the progression of atrial arrhythmia through an ensemble of Generative Adversarial Network Discriminators
Nahuel Costa, *Jesús Fernández, Inés Couso, Luciano Sánchez*
Conference of the European Society for Fuzzy Logic and Technology (EUSFLAT), 2019, Praga, Czech Republic, DOI: 10.2991/eusflat-19.2019.78

Teaching Experience

Assistant Professor University of Oviedo **2023-Present**
Supervising several bachelor's theses and co-supervising a Ph.D. thesis in "Prognosis of Degenerative Diseases Using Unsupervised and Partially Supervised Learning Techniques"
Algorithmics (EN), Business Inteligence
Bachelor's Degree in Computer Engineering in Information Technology
Algorithmics, Data Visualization, Generative Models
Bachelor's Degree in Data Science

Lecturer University of Oviedo **2022-2023**
Co-Supervisor for four BA thesis (two thesis award)
Introduction to programming, Algorithmics, Business Inteligence
Bachelor's Degree in Computer Engineering in Information Technology
Algorithmics
Bachelor's Degree in Data Science
Operating Systems (EN)
Bachelor's Degree in Software Engineering

Lecturer University of Oviedo **2021-2022**
Algorithmics
Bachelor's Degree in Data Science
Operating Systems (EN), Databases
Bachelor's Degree in Software Engineering
Introduction to programming, Algorithmics
Bachelor's Degree in Computer Engineering in Information Technology

Lecturer University of Oviedo **2020-2021**
Operating Systems (EN), Databases, Programming Methodology (EN)
Bachelor's Degree in Software Engineering

Awards

EPI Awards University of Oviedo **2024**
Best Teaching Innovation Award

Mobility Fellowship University of Oviedo **2024**
Regional competition

Mobility Fellowship University of Oviedo **2022**
Regional competition

Best thesis project - Doctoral Consortium Conference of the Spanish Association of Artificial Intelligence **2021**
For the thesis project "Explainable condition monitoring from imprecise information"

Best master's thesis project University of Oviedo **2020**
For the project "Diagnosis of Atrial Fibrillation by intelligent analysis of intracardiac of recordings"

Mentee IMFAHE **2019**
Chosen as one of the 10 students selected from the University of Oviedo to participate in the professional and academic development programs of excellence promoted by the International Mentoring Foundation for the Advancement of Higher Education (IMFAHE). Mentored by Dr. Francisco Costela, researcher at Schepens Eye Research Institute, Harvard Medical School.

Master Fellowship Principado de Asturias **2019**
Full tuition scholarship

Most innovative Idea EbIC University Awards **2019**
For the project "Preprocessing and intelligent treatment of intracardiac electrocardiograms"

Professional Activities and Service

Guest Editor **2023**
Array
Special issue: Weak and cautious learning: conceptual foundations and practical algorithms

Session Chair Salamanca **2023**
International Conference on Soft Computing Models in Industrial and Environmental Applications
Chaired the session: Genetic and Evolutionary Computation in Real World and Industry

Special Session Organizer Milano **2022**
International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems
Organized special session on Machine Learning for Partially Labeled Data

Reviewer
IPMU (2022), IEEE JBHI, IJAR, Array, Journal of Supercomputing

Talks and Tranining courses

Introductory course on generative Artificial Intelligence **2025**
A.C.G. Engineering, S.A.

Image generation with Artificial Intelligence **2025, May**
Instituto Asturiano de Administración Pública Adolfo Posada

Database audit for a future public health information system **2025**
Public Health Tuesdays, Regional Ministry of Health

Is AI Hitting a Wall? **2024**
Outreach Day of the Total Energies Chair of Data Analytics and Artificial Intelligence
[Link to video]

Rapidae - A Python Library for Creation, Experimentation, and Benchmarking of Autoencoder Models **2024**
IEEE World Congress on Computational Intelligence

Image generation with Artificial Intelligence **2024, May, October**
Instituto Asturiano de Administración Pública Adolfo Posada

Learn how to create a realistic and intelligent NPC **2024**
Feria de la Ciencia y la Innovación de Asturias

Generative AI - Benefits and Limitations **2023**
Total Energies
Total Energies Web Publication
ES slides

Enhancing Time Series Anomaly Detection Using Discretization and Word Embeddings **2023**
18th International Conference on Soft Computing Models in Industrial and Environmental Applications

ChatGPT and Other Generative AIs **2023**
Total Energies
ES slides

AI in Biomedicine **2023**
CEU San Pablo University
ES slides

Courses

Design and Implementation of the Rubric as an Evaluation Resource Online **2024**
INIE

Professional Development Program for Professors and Researchers Online **2024**
IMFAHE

Gamification Applied to University Education Online **2024**
INIE

Qualitative Research: Steps and Components of Design Creation Online **2024**
INIE

Inclusive University and University Inclusion **2024**
INIE

Approach to University Management **2024**
INIE

Elaboration of a Teaching Innovation Project: Tips and Practical Suggestions **2023**
INIE

Peer Reviewer Course Online **2022**
Elsevier

Identify and train your research talents Online **2021**
INIE

Convolutional Neural Networks in Tensorflow Online **2021**
DeepLearning.AI

Natural Language Processing in TensorFlow Online **2021**
DeepLearning.AI

Sequences, Time Series and Prediction Online **2021**
DeepLearning.AI

Quarter Course in Professional Development Online **2020**
IMFAHE

How to present a scientific communication Online **2021**
INIE

Practical Deep Learning for Coders, v3 Online **2019**
FastAI

Android development from scratch Online **2019**
Udemy

Other Experience

Podcaster Gijón, Spain **2024-Now**
 The Training Loop Podcast
An AI researcher and an entrepreneur team up to create an entertainment podcast. A wide variety of guests from different fields.

Software Developer, Internship Gijón, Spain **2018**
 Bytácora Soluciones Informáticas
Development of a help desk ticketing system - Enterprise Resource Planning (ERP) – Odoo modules – Pycharm – Python – XML

Software Developer, Internship Gijón, Spain **2018**
 PSWService
Web app development – Ionic – AngularJS (HTML5, CSS, Javascript) – PHP