



Javier Alonso JAIMES CUCHO

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 linkedin |  github

PROFESSIONAL PROFILE

Civil Engineer and AI researcher with interests in Spatial Data Science and GeoAI applications for sustainable infrastructure and disaster seismic risk assessment.

My research integrates satellite remote sensing (SAR and optical), deep learning for geospatial segmentation, urban growth modeling, and seismic risk analysis. I develop scalable computational frameworks that combine machine learning, geospatial data, and infrastructure modeling to support resilient urban planning and smart construction systems.

Research Interests: GeoAI, Spatial Computing, Remote Sensing, Urban Analytics, Infrastructure Resilience, Smart Construction, Disaster Seismic Risk Modeling.

EDUCATION

PONTIFICAL CATHOLIC UNIVERSITY OF PERU (PUCP)

2018–2022 / Peru

CIVIL ENGINEER – SECOND HIGHEST GPA, CLASS OF 2022-2

NATIONAL UNIVERSITY OF ENGINEERING (UNI)

2024–Present / Peru

MASTER'S DEGREE IN ARTIFICIAL INTELLIGENCE

PONTIFICAL CATHOLIC UNIVERSITY OF PERU (PUCP)

2024–2025 / Peru

MASTER'S DEGREE IN NATURAL RISK MANAGEMENT

RESEARCH EXPERIENCE

CONCYTEC–PROCIENCIA – PROJECT PE501086366-2024

2025–Present / Peru

RESEARCH ASSISTANT

- Conduct geospatial analysis and spatial variable engineering for Multi-Criteria Decision Analysis (MCDA) in territorial and infrastructure planning.
- Process and harmonize multi-temporal satellite imagery (Landsat 8, Sentinel-2) for land cover classification and environmental indicator extraction.
- Perform radiometric correction, cloud masking, and spectral index computation (NDVI, NDBI, etc.) to support spatial suitability modeling.

CONCYTEC–PROCIENCIA – PROJECT PE501091200-2024

2024–Present / Peru

TECHNICAL MANAGER ([LINK](#))

- Thesis: "Monitoring Urban Growth in Vulnerable Areas Using Satellite Imagery and Artificial Intelligence."

- Designed a semi-supervised convolutional neural network (CNN) for urban expansion segmentation under limited labeled data conditions.

- Integrated Sentinel-2 imagery, OpenStreetMap (OSM), and open geospatial datasets for hazard exposure mapping.

- Developed weak-supervision strategies for scalable GeoAI applications in data-scarce environments.

- Identified emerging urban clusters and high-risk zones in Metropolitan Lima.

CONCYTEC–PROCIENCIA – PROJECT PE501077930-2022

2022–2023 / Peru

RESEARCH ASSISTANT ([LINK](#))

- Developed an early detection methodology for informal settlements using SAR satellite imagery (Sentinel-1).

- Processed radar imagery using SNAP and GDAL workflows.

- Trained and validated machine learning models (Scikit-learn) using real field data (Lomo de Corvina, 2021).

- Contributed to seismic exposure and vulnerability assessment in rapidly urbanizing areas.

- Thesis: "Application of Machine Learning Techniques and Radar Imagery for Early Detection of Informal Settlements in High-Risk Areas." ([Link](#))

PUBLICATIONS

•Jaimes-Cucho, J.A. "Semi-Supervised Segmentation for Mapping Urban Expansion and Hazard Exposure in Lima, Peru." Preprint in NHESS. (DOI)

•Jaimes-Cucho, J.A. "Informal Urban Growth Monitoring in Earthquake-Prone Areas Using SAR Satellite Images." WCEE 2024 Conference. (PDF)

•Co-author. "Vulnerabilities and Exposure of Recent Informal Urban Areas in Lima, Peru." Progress in Disaster Science (PDISAS). (DOI)

TECHNICAL SKILLS

PROGRAMMING & AI	Python (PyTorch, Scikit-learn, NumPy, Pandas, GDAL), C++, C#, MATLAB, Dynamo
GEOSPATIAL & REMOTE SENSING	QGIS, SNAP, Sentinel-1 & 2 processing, OpenStreetMap integration, GDAL workflows
INFRASTRUCTURE MODELING	OpenSeesPy, OpenQuake, ETABS (API), SAP2000 (API), SAFE, Revit (API)
SCIENTIFIC COMPUTING	SciPy, FEM modeling, automation scripts for structural workflows
LANGUAGES	Spanish (Native), English (Upper-Intermediate, TOEFL iBT 88)

TEACHING EXPERIENCE

PONTIFICAL CATHOLIC UNIVERSITY OF PERU (PUCP)

2022–Present / Peru

TEACHING ASSISTANT – ENGINEERING AND SCIENCE COURSES

•Physics I–IV, Multivariable Calculus, Dynamics, Strength of Materials.

PROFESSIONAL EXPERIENCE

SYZ MINGESA

2023–2024 / Peru

BIM MODELER AND STRUCTURAL DESIGNER

•Automated structural workflows in Revit using Dynamo, Python, and C#. (Project Example)

FREELANCE / INDEPENDENT

2025–Present / Peru

STRUCTURAL DESIGNER AND INSPECTOR

•Structural design, technical inspections, and infrastructure parameterization for infrastructural and residential projects.

ACADEMIC DISTINCTIONS

- Second Highest GPA – Civil Engineering PUCP (2022-2)
- Honor Roll – PUCP General Studies
- Three International Publications (NHESS - WCEE 2024 - PDISAS)
- Undergraduate Thesis with Distinction