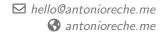
Antonio Reche García



All researcher working on computer vision for space weather forecasting as a PhD candidate at University of Alcalá, with research published in Astronomy & Astrophysics and presented at ESA. Previously led Al development at medical startup Medicsen, where I built an autonomous glucose prediction system that achieved regulatory certification (AEMPS) and was deployed to patients. Interested in efficient AI systems and solving scientific problems with small, capable models.

Experience

Nov. 2023 - Research Fellow (PhD Candidate from Dec. 2024), University of Alcalá, Alcalá present de Henares

> Computer vision and deep learning research in solar physics within the Space Weather Group, focused on solar filament detection and space weather forecasting.

- Published first-author paper in Astronomy & Astrophysics on polar faculae and their relationship to the solar cycle (2025).
- O Developed DETR-based framework for automated solar filament detection, classification, and tracking to study their temporal evolution and relationship to space weather phenomena.
- Created and released open solar filament dataset (SWEFil) for object detection.
- Presented research at European Space Agency (SPAICE 2024) and additional conferences.

2017 – 2022 Chief Analytics Officer, Medicsen, Madrid

Led AI and data analysis R&D for this medical technology startup developing a needle-free drug delivery device and solutions for chronic diseases patients.

- Developed SugginAI, an AI-powered glucose prediction system that earned official **AEMPS medical device certification,** obtaining 97 - 99% clinically safe predictions. It was served via cloud-based APIs and used by 100+ patients through a mobile application, using a self-learning architecture that enabled continuous model improvement from real-world patient data without manual retraining.
- Built suite of Al solutions: anomaly detection models for medical time series, voice-based NLP system for conversational data logging with automatic nutritional extraction, and recommendation algorithms for personalized health interventions.
- Initiated development of closed-loop artificial pancreas system integrating prediction models with automated insulin delivery, and simulations of the human metabolism pharmacokinetic system for drug delivery optimization.
- O Designed and conducted a clinical trial for device validation; provided statistical analysis support for additional trials.
- Built and maintained medical databases (1M+ records) including ETL pipelines and visualization dashboards.
- O Supervised 3 intern students in Al model development and data analysis projects.

Education

Dec. 2024 - PhD Candidate in Science, University of Alcalá.

present Specialization: Computer vision for solar physics and space weather forecasting.

2022 - 2023 Master's Degree in Astronomy and Astrophysics, International University of Valencia.

> Thesis: The Great Solar Migration: Transporting Magnetic Field to the Poles. (Detection and analysis of magnetic structures in solar images using deep learning).

2015 – 2016 Master's Degree in Physics and Mathematics (FisyMat), University of Granada. Thesis: Emerging Phenomenology in a Physical-Mathematical Model of a Degenerative Neural Network.

2010 – 2015 Bachelor's Degree in Physics, University of Granada.

Erasmus Programme at Università Degli Studi di Torino (Italy).

Thesis: Dynamic Light Scattering and Brownian Motion for Measuring the Size of Colloidal Particles.

Publications

[1] <u>A. Reche</u>, A. Pastor Yabar, and A. B. Griñón-Marín. *Polar faculae and their relationship to the solar cycle*, Astronomy & Astrophysics, vol. 699, p. A340, Jul. 2025.

Conference papers

[2] **A. Reche** and C. Cid, *Solar filament detection, classification, and tracking with deep learning*, Zenodo, 2024.

Seminars and Conferences

- October 2025 ESWW25, Umeå, Sweden, Solar filament framework and polar faculae research.
 - April 2025 MCH25, Sofia, Bulgaria, Solar filament framework and polar faculae research.
 - September SPAICE 2024, ESA ECSAT, Harwell, UK, Solar filament detection, classification, and 2024 tracking with deep learning
 - July 2024 XVI SEA, *Granada, Spain*, Solar filament detection, classification, and tracking with deep learning
 - July 2023 VIII REFSH, Granada, Spain, The Great Solar Migration: Transporting Magnetic Field to the Poles.
 - June 2023 **Stanford Solar Seminar**, *Stanford, CA, USA*, The Great Solar Migration: Transporting Magnetic Field to the Poles.
 - May 2022 **CEU San Pablo University**, *Madrid*, *Spain*, Needle-Free Medicine and the Development of an Artificial Pancreas.

Projects

- 2025 present Building Paper Pivot, an AI tool that automatically formats academic manuscripts to journal-specific submission requirements.
 - 2016 2017 Part of the development team for **Necrocosmos** science fiction video game: pixel art, Kickstarter campaign design, scientific advising, and beta testing.

Technical Skills

- AI/ML PyTorch, Keras/TensorFlow/JAX, scikit-learn, computer vision, NLP, time series forecasting.
- Languages Python, R, HTML, CSS, SQL, JavaScript, LaTeX.
- Engineering Docker, Git, API & cloud deployment (GCP/Fly.io), full-stack web development.
 - Domain Medical device development, clinical trials, regulatory compliance, scientific computing.

Volunteering

2023 – 2024 Citizen scientist for ESA's STARS project, screening literature on space radiation health effects to inform spaceflight medical operations.