Dr Amal Chakhar

Leeds, UK | chakhar.amal@gmail.com | amalchakhar.com | ORCID 0000-0002-4294-1015 | Google Scholar

Research Interests

Remote sensing • precision agriculture • crop classification • machine learning for Earth observation • soil moisture retrieval • irrigation detection • evapotranspiration • drought monitoring.

Bibliometrics: 10 peer-reviewed publications • 335 citations • h-index 7 (Google Scholar, June 2026).

Current Position

Research Fellow in Remote Sensing and Modelling for Crop Sustainability and Resilience, School of Earth and Environment, University of Leeds Jul 2024 – Present

- Member of the Institute for Climate and Atmospheric Science, contributing to **iSPARK** (Innovation in Sustainability, Policy, Adaptation and Resilience in Kenya).
- Develop multi-sensor Earth observation methods, combining Sentinel-1 and Sentinel-2 time series with machine learning, to monitor cropping systems, vegetation dynamics and agricultural resilience under climate variability in smallholder farming systems across Eastern Africa.
- Mapping drought stress in maize monocrop versus intercrop systems in western Kenya to inform climate-resilience policy; presented at the 3rd International Crop Modelling Symposium (iCROPM2026), Florence, Feb 2026.

Previous Positions

Postdoctoral Researcher, Regional Development Institute (IDR), University of Castilla-La Mancha, Spain Mar 2023 – Jun 2024

- Remote sensing and precision agriculture: UAV-based vine disease detection, irrigation monitoring, and fusion of optical and radar satellite data for agricultural applications.

Predoctoral Researcher, University of Castilla-La Mancha, Spain 2019 – 2023

- Doctoral research integrating satellite remote sensing, UAV photogrammetry and geospatial analysis, under a competitive scholarship co-financed by the European Social Fund.

Research Staff, National Institute for Research in Rural Engineering, Water and Forestry (INRGREF), Tunisia 2015 – 2016

- Estimation of actual evapotranspiration using eddy covariance measurements in a hilly watershed.

Education

PhD in Agricultural and Environmental Sciences, University of Castilla-La Mancha, Spain 2023

- Thesis: *Advances in Multi-Sensor Remote Sensing Information and Machine Learning for Crop Classification and Surface Soil Moisture Retrieval*.
- Supervisors: Dr Miguel Á. Moreno and Dr David Hernández-López (UCLM).

MSc in Integrated Planning for Rural Development and Environmental Management, CIHEAM Zaragoza / University of Lleida, Spain 2018

Engineering Degree in Horticultural Systems, University of Sousse, Tunisia 2015

Skills and Tools

Programming: Python (NumPy, pandas, scikit-learn), R, JavaScript (Google Earth Engine).

Earth Observation: Sentinel-1 (SAR), Sentinel-2 (multispectral), Landsat-8, UAV photogrammetry, time-series analysis, datacubes.

Machine Learning: Supervised classification (Random Forest, SVM, kNN), accuracy assessment, feature engineering on multi-source EO data.

Geospatial: Google Earth Engine, QGIS, ArcGIS, GDAL.

Languages: Spanish, English, French (professional working proficiency); Arabic (native).

Publications

[1] **Amal Chakhar** et al. "Assessing the Accuracy of Multiple Classification Algorithms Combining Sentinel-1 and Sentinel-2 for the Citrus Crop Classification and Spatialization of the Actual Evapotranspiration Obtained from Flux Tower Eddy Covariance: Case Study of Cap Bon, Tunisia". In: *Proceedings of IAHS* 385 (2024), pp. 443–448. DOI: 10.5194/piahs-385-443-2024.

[2] **Amal Chakhar** et al. "Irrigation Detection Using Sentinel-1 and Sentinel-2 Time Series on Fruit Tree Orchards". In: *Remote Sensing* 16.3 (2024), p. 458. DOI: 10.3390/rs16030458.

[3] **Amal Chakhar** et al. "Optimized Software Tools to Generate Large Spatio-Temporal Data Using the Datacubes Concept: Application to Crop Classification in Cap Bon, Tunisia". In: *Remote Sensing* 14.19 (2022), p. 5013. DOI: 10.3390/rs14195013.

[4] **Amal Chakhar** et al. "Design of a Local Nested Grid for the Optimal Combined Use of Landsat 8 and Sentinel 2 Data". In: *Remote Sensing* 13.8 (2021), p. 1546. DOI: 10.3390/rs13081546.

[5] **Amal Chakhar** et al. "Improvement of the Soil Moisture Retrieval Procedure Based on the Integration of UAV Photogrammetry and Satellite Remote Sensing Information". In: *Remote Sensing* 13.24 (2021), p. 4968. DOI: 10.3390/rs13244968.

[6] **Amal Chakhar** et al. "Improving the Accuracy of Multiple Algorithms for Crop Classification by Integrating Sentinel-1 Observations with Sentinel-2 Data". In: *Remote Sensing* 13.2 (2021), p. 243. DOI: 10.3390/rs13020243.

[7] **Amal Chakhar** et al. "Assessing the Accuracy of Multiple Classification Algorithms for Crop Classification Using Landsat-8 and Sentinel-2 Data". In: *Remote Sensing* 12.11 (2020), p. 1735. DOI: 10.3390/rs12111735.

[8] Laura Piedelobo et al. "Scalable Pixel-Based Crop Classification Combining Sentinel-2 and Landsat-8 Data Time Series: Case Study of the Duero River Basin". In: *Agricultural Systems* 171 (2019), pp. 36–50. DOI: 10.1016/j.agsy.2019.01.005.

[9] Rim Zitouna-Chebbi et al. "Observing Actual Evapotranspiration from Flux Tower Eddy Covariance Measurements within a Hilly Watershed: Case Study of the Kamech Site, Cap Bon Peninsula, Tunisia". In: *Atmosphere* 9.2 (2018), p. 68. DOI: 10.3390/atmos9020068.

[10] Rim Zitouna-Chebbi et al. "Observing Actual Evapotranspiration within a Hilly Watershed: Case Study of the Kamech Site, Cap Bon Peninsula, Tunisia". In: *Proceedings* 1.5 (2017), p. 134. DOI: 10.3390/ecas2017-04134.

Conference Presentations and Talks

- *Drought stress monitoring for climate resilience: maize monocrop vs. intercrop in western Kenya.* 3rd International Crop Modelling Symposium (iCROPM2026), Florence, Italy, 2026. Oral.
- *Integración de sistemas de alerta y modelos matemáticos para comprender la dinámica epidemiológica del mildiu de la vid.* V Jornadas del Grupo de Viticultura de la SECH, Spain, 2024. Oral.
- *Detección de riego mediante series temporales Sentinel-1 y Sentinel-2 sobre campos de frutales.* XXXIX Congreso Nacional de Riegos, Úbeda, Spain, 2023. Oral.
- *Citrus crop classification with Google Earth Engine and potential spatialization of actual evapotranspiration from flux-tower eddy covariance: Cap Bon, Tunisia.* NENA-ETNet Symposium, Rabat, Morocco, 2022. Oral.
- *Assessing the accuracy of citrus crop classification using optimized software tools to generate large spatio-temporal data: Cap Bon, Tunisia.* X Jornadas Doctorales, University of Castilla-La Mancha, Spain, 2022. Poster.
- *Recuperación de humedad del suelo sobre campos agrícolas con observaciones Sentinel-1 y Sentinel-2 y rugosidad obtenida de fotogrametría UAV.* XXXVIII Congreso Nacional de Riegos, Cartagena, Spain, 2021. Oral.
- *Ability of SAR (Sentinel-1) and optical (Sentinel-2) data to detect vegetation dynamics of cereal and horticultural crops: Tarazona, SE Spain.* IX Jornadas Doctorales, University of Castilla-La Mancha, Spain, 2019. Poster.
- *A procedure for Sentinel-2 image calibration using UAV imagery for agriculture applications.* II Congreso de Jóvenes Investigadores en Ciencias Agroalimentarias, University of Almería, Spain, 2019. Poster.
- *A procedure for satellite image calibration using UAV imagery for agriculture applications.* IV Jornadas Científicas de la Sociedad Española de Biometría, Spain, 2019. Oral.
- *Multi-temporal comparison of UAV and Sentinel-2 images.* 19th Scientific Conference of the National Institute for Research in Rural Engineering, Water and Forestry (INRGREF), Tunisia, 2019. Oral.
- *Comparación multi-temporal de imágenes de vehículos aéreos no tripulados y Sentinel-2.* I Congreso de Jóvenes Investigadores en Ciencias Agroalimentarias, University of Almería, Spain, 2018. Poster.

Teaching

Teaching collaboration, University of Castilla-La Mancha 2019 – 2021

- 90 certified hours of Master's-level theoretical instruction across two courses.
- *Instalaciones en las Industrias Forestales*, MSc in Forestry Engineering (2019/20, 2020/21) — 80 hours.
- *Construcciones e Infraestructuras Rurales*, MSc in Agricultural Engineering (2020/21) — 10 hours.

Awards and Grants

- **Predoctoral research contract** (PhD scholarship), University of Castilla-La Mancha — co-financed by the European Social Fund (FSE), 2014–2020 Operational Programme of Castilla-La Mancha. 2019–2023.

Research Projects

- **HERCULES** — Prediction and management of water and energy demand in irrigation communities using interoperable satellite, drone and sensor data. Junta de Comunidades de Castilla-La Mancha. 2020–2022 (EUR 28,900). Developed the operational methodology to estimate surface soil moisture in semi-arid environments by combining C-band SAR backscatter (VV) with optical NDVI.

Professional Activities

- Peer reviewer, *Remote Sensing* (MDPI) — 3 reviews, 2021.
- Peer reviewer, *Precision Agriculture* (Springer Nature) — 2 reviews, 2023–2024.

References

Available on request.