Ana Herrero-Langreo, Ph.D

UCD School of Biosystems and
Food Engineering, Belfield,
Dublin 04, Ireland

PROFILE

Educator and Researcher

I am an enthusiastic agronomist and scientist. I am specialized in Multivariate Data Analysis (chemometrics) for digital agriculture. My research interests focus on Visible, Near Infrared and Mid Infrared spectroscopy, as well as on hyperspectral imaging applications for supporting sustainable digital agriculture, food quality assessment and food safety. I am particularly invested in teaching, tutoring and mentoring activities as well as in Education and Public Engagement initiatives. Curious, enthusiastic and a good communicator, I am experienced both in leading scientific research and in the dissemination and transfer of scientific knowledge.

EXPERIENCE

Professional Experience in HEIs, Private and Public Organizations

2022 – Current
SFI Fellowship Awardee[1]. Responsible for data management and presentation for the International Team Support on the organization of international trade missions, including the St. Patrick's Day Science Medal Award. Management, showcase and stakeholder engagement for the SFI Discover funding call. Participation as science ambassador in: Climate Detectives and Science Blast.

2017 – 2021
Senior Post-doctoral Researcher at UCD-SIRG[2]. HyperMicroMacro project (ID 15/IA/2984). Responsibilities included research activities, project management, mentoring, and public engagement **Awarded Funding Grants:** 93 565 euros of funding by the Spanish Program Torres Quevedo (2017); 186 000 euros funding from Internal UCD infrastructure call.

2014 – 2017
Freelance Researcher. Self-promoted Research Collaborations with the Research Institutes LPF-TAGRALIA[3](Madrid, Spain), *INRAE-ITAP[4]* (Montpellier, France) and UPN[5](Navarra, Spain).

2012 – 2014
Post-doctoral Researcher at *INRAE-ITAP[4]*. AKER French National Project. Responsible for project management, coordination with research partners, design and development of experimental protocols, experimental work, data analysis writing and presentation of scientific results.

2011 – 2012
Post-doctoral Researcher at the company Fruition Sciences[6]. Management of research collaboration with Montpellier-SupAgro[7] at the PILOTYPE Project. Responsible for technology transfer regarding sampling methods applied to the spatial modelling of vine water status.

2005 – 2006
Research Assistant at LPF-TAGRALIA[3]. Laboratory work, data collection and collation, data analysis.

TEACHING

Formal and Non-Formal Teaching Experience

2021 - 2022
Teaching Assistant at the UCD School of Biosystems and Food Engineering. Modules BSEN40500 – Hyperspectral imaging (50h), and BSEN40520 - Optical Sensing Technology (20h). Delivered as blended teaching, including development of digital resources, videos, datasets, software toolboxes, quizzes, and online tutoring. Module Responsible: Prof. Aoife Gowen. See Teaching Portfolio for details.

2017 – 2020
Invited lecturer and student tuition at UCD-SIRG[2]. Organization of Arts and Science communication events in collaboration with Ranelagh Arts Centre and Conway Institute. Participation in Soapbox Science Ireland for the promotion of Women in Research.

2006 – 2017
Invited lecturer and student tuition at Montpellier University (2010-2015). International data analysis workshops (2006-2010). Student tuition at Montpellier University (2007-2016). Active pedagogy teaching of sciences with the association Les Petits Débrouillards: responsible for the development of content and protocols for children 7-11 years old. (2015 - 2017).

EDUCATION

Third Level Education in STEM and Teaching & Learning

2006 – 2010
PhD. Studies. *ETSIAAB –UPM[8]*. Public lecture held on June 25th 2010. Thesis title: "Spectral Machine Vision for Peach Ripeness Assessment". Self-promoted stays at *INRAE-ITAP[4] and NIAB-EMR[9].*

2023 – Current
MSc in Education and Training Management (e-learning). Dublin City University.

2021 – 2022
Postgraduate Certificate in Creativity and Innovation for Education Innovation Academy, University College Dublin.

1998 – 2005
Agronomy Engineering Degree. *ETSIAAB –UPM[8]*. Plant Science and Production. Socrates-Erasmus Exchange student at Ghent University, Belgium (2003-2004). Leonardo grant for training at NIAB-EMR[9] on the Raspberry Breeding Program, UK (May- July 2005).

MERITS — Contributions to the Scientific Body of Knowledge

Publication Metrics: 20 peer reviewed journal publications, 2 book chapters, and 38 conference presentations.

Research Narrative: The main original contributions of my research are based on the combination of spatial and spectral information to improve model performance and robustness. I developed an original approach based on the integration of two frameworks of knowledge: Chemometrics and Geostatistics. This line of research has relevant applications for hyperspectral imaging classification and regression models, as well as for improving the applicability of spatial models based on ancillary measurements used in digital agriculture. Both areas are relevant for sustainable systems research.

Research Profiles: ORCID 0000-0003-3258-6248; Research Gate: Ana-Herrero-Langreo

Committees: HelioSPIR Conference (2019- 2024). Board member and responsible for organizing round tables.

ChemHouse (2019- 2023). Active participation in the community of practice for chemometrics.

IEEE-whispers (2019). Logistic support and peer review of conference abstracts.

MatLab Clinic UCD Community of Learning Practice (2023-2024) – Founder and facilitator.

LANGUAGES — Fluent in English, French and Spanish

English: Full professional proficiency (C2). Working language since 2005. PhD thesis written in English.

French: Advanced level (C1) Fluent in spoken and written language. Working language from 2010 to 2016.

Spanish: Native. Scientific writing, storytelling, poetry, and short story writing.

COMPUTER SKILLS — Coding, Data Management and Multimedia Content Creation

Competent use of Office, Mendeley, MatLab (toolbox development), Canva, Tableau, Genially.
Basic use of R, QGIS (Open GIS), SQL, ImageJ, Inkscape, DaVinci Resolve, Brightspace.

INTERESTS — Social and Creative Activities

Participation in creative and public engagement associations including Pay Attention Collective (PA!C, 2019 - 2024), and Ranelagh Arts (2017-2019) Amateur of graphic arts; creative writing; and film and documentary production (KINO: 2014-2015, DCU: 2024).

PUBLICATIONS — Five Selected Publications

Xu, J.-L., **Herrero-Langreo, A.,** Lamba, S., Ferone, M., Swanson, A., Caponigro, V., Scannell, A. G. M., & Gowen, A. A. **Exploring the identification of multiple bacteria on stainless steel using multi-scale spectral imaging from microscopic to macroscopic**. Scientific Reports, 12(1), (2022). https://doi.org/10.1038/s41598-022-19617-3.

Swanson A., **Herrero-Langreo A.,** Gowen A., **Comparison of portable spectral imaging (443–726 nm) and RGB imaging for predicting poultry product "use-by" status through packaging film**, Journal of Spectral Imaging. 1 (2021) 1–9. doi:10.1255/jsi.2021.a6.

Herrero-Langreo A., Gorretta N., Tisseyre B., Gowen A., Xu J.-L., Chaix G., Roger J.-M., **Using spatial information for evaluating the quality of prediction maps from hyperspectral images: A geostatistical approach**, Analytica Chimica Acta. 1077 (2019) 116–128. doi:10.1016/j.aca.2019.05.067. 7.

Herrero-Langreo A., Tisseyre B., Roger J.M., Scholasch T., Payen S., **Test of Sampling Methods to Optimize the Calibration of Vine Water Status Spatial Models**. Precision Agriculture. 19 (2), (2018) 365-378. doi: 10.1007/s11119-017-9523-8 4.

Herrero-Langreo A., Fernández-Ahumada E., Roger J.M., Palagós B., Lleó L. (2012). **Combination of Optical and Non-destructive Mechanical Techniques for the Measurement of Maturity in Peach**, Journal of Food Engineering, 108 (1), 150-157, doi:10.1016/j.jfoodeng.2011.07.004.

ACRONYMS — Employers and Collaborators as Cited on the Text

[1] ***UCD-SFI Fellowship:*** *Science Foundation Ireland Fellowship Award, International and Education and Public Engagement Teams.*
[2] ***UCD-SIRG:*** *University College of Dublin. Spectral Imaging Research Group. School of Biosystems and Food Engineering, Ireland.*
[3] ***LPF-TAGRALIA:*** *Laboratorio de Propiedades Físicas y Tecnologías Avanzadas en Agroalimentación. Madrid, España.*
[4] ***INRAE-ITAP:*** *Unité mixte de Recherche Information, Technologies, Analyse environnementale, Procédés Agricoles. France.*
[5] ***UPNA:*** *Institute for Multidisciplinary Research in Applied Biology. Universidad Pública de Navarra. Pamplona, España.*
[6] ***Fruition Sciences:*** *Technology transfer company for precision viticulture. Montpellier, France.*
[7] ***Montpellier-SupAgro:*** *Agronomy Engineering School. Viticulture Engineering (Bât. 21). Montpellier, France.*
[8] ***ETSIAAB- UPM:*** *Escuela técnica Superior de Ingenieros Agrónomos. Universidad Politécnica de Madrid. Madrid, España*
[9] ***NIAB-EMR:*** *East Malling Research, Research on Horticultural Crops and Plants. East Malling, Kent, U.K.*