

PUBLICATIONS LIST

1. SCIENTIFIC PUBLICATIONS

- [SC 21]. Xu, J. L., **Herrero-Langreo, A.**, Lamba, S., Ferone, M., Swanson, A., Caponigro, V., Scannell, A. G. M., & Gowen, A. A. (2022). **Exploring the identification of multiple bacteria on stainless steel using multi-scale spectral imaging from microscopic to macroscopic**. *Scientific Reports*, 12(1), 1–21. <https://doi.org/10.1038/s41598-022-19617-3>
- [SC 20]. Xu J., **Herrero-Langreo A.**, Lamba S., Ferone M., Scannell A.G.M, Caponigro V., Gowen A.A. **Characterisation and Classification of Foodborne Bacteria Using Reflectance FTIR Microscopic Imaging**. *Molecules* 26, 6318 (2021). 10.3390/molecules26206318
- [SC 19]. 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, 1–9 (2021). 10.1255/jsi.2021.a6
- [SC 18]. Xu J., Lin X., Hugelier S., **Herrero-Langreo A.**, Gowen A, **Spectral imaging for characterization and detection of plastic substances in branded teabags**, *Journal of Hazardous Materials*. 418 (2021) 126328. doi:10.1016/j.jhazmat.2021.126328.
- [SC 17]. Xu J., Riccioli C., **Herrero-Langreo A.**, Gowen A., **Deep learning classifiers for near infrared spectral imaging: a tutorial**, *Journal of Spectral Imaging* (2020). doi:10.1255/jsi.2020.a19.
- [SC 16]. Caponigro V., Marin F., Dorrepaal R.M., **Herrero-Langreo A.**, Scannell A.G.M., Gowen A., **Raman and Fourier transform infrared hyperspectral imaging to study dairy residues on different surfaces**, *Journal of Spectral Imaging*, 8 (2019). doi:10.1255/jsi.2019.a3.
- [SC 15]. **Herrero-Langreo A.**, Gorretta N., Tisseyre B., Gowen A., Jun-Li Xu, Chaix G., Roger JM. (2019), **Using Spatial Information for Evaluating the Quality of Prediction Maps from Hyperspectral Images: A Geostatistical Approach**. *Analytica Chimica Acta*. (In Press). Available at <https://authors.elsevier.com/a/1ZNfVIYfXdTC>.
- [SC 14]. Bendoula R., Ducanhez A., **Herrero-Langreo A.**, Guerrero-Castro P., Roger JM., Gobrecht A., (2019). **Effect of the architecture of fiber-optic probes designed for soluble solid content prediction in intact sugar beet slices**. *Sensors (Basel)*.19(13). doi: 10.3390/s19132995
- [SC 13]. Caponigro V., Marini F., Dorrepaal R. M., **Herrero-Langreo A.**, Gowen A., (2019). **Raman and Fourier Transform Infrared hyperspectral Imaging to Study Dairy Residues in Different Surfaces**. *Journal of Spectral Imaging Special Issue for IASIM-2018* . Vol 8, pp: a3. 10.1255/jsi.2019.a3
- [SC 12]. Gowen A., Xu J., **Herrero-Langreo A.** (2019), **Comparison of spectral selection methods in the development of classification models from visible near infrared hyperspectral imaging data**. *Journal of Spectral Imaging*. 8 a4. doi:DOI:10.1255/jsi.2019.a4.
- [SC 11]. **Herrero-Langreo A.**, Tisseyre B., Roger J.M., Scholasch T., Payen S., (2018) **Test of Sampling Methods to Optimize the Calibration of Vine Water Status Spatial Models**. *Precision Agriculture*. 19 (2), 365-378. 10.1007/s11119-017-9523-8
- [SC 10]. Mishra P, Mohd Shahrime M, **Herrero-Langreo A**, Lohumi S, Diezma Iglesias B, Scheunders P. (2017) **Close range hyperspectral imaging of plants: A review of recent applications and technical challenges**. *Biosystems Engineering*. 164:49–67. 10.1016/j.biosystemseng.2017.09.009
- [SC 9]. Santesteban L.G., Di Gennaro S. F., **Herrero-Langreo A.**, Miranda C., Royo J.B., Matese A. (2016) **High-resolution UAV-based thermal imaging to estimate the instantaneous and seasonal variability of plant water status within a vineyard**. *Agricultural Water Management*. 10.1016/j.agwat.2016.08.026
- [SC 8]. Mishra P., **Herrero-Langreo A.**, Barreiro P., Roger J.M., Diezma B., Gorretta N., Lleó L. (2015). **Hyperspectral to Multispectral Imaging for Detection of Tree Nuts and Peanut Traces in Wheat Flour**. *Journal of Near Infrared Spectroscopy*. 10.1255/jsi.2015.a2
- [SC 7]. Mishra P., **Herrero-Langreo A.**, Barreiro P., Roger J. M., Diezma B., Gorretta N., Lleó L. (2015). **Detection and Quantification of Peanut Traces in Wheat Flour through NIR Hyperspectral Imaging Spectroscopy Using Principal Component Analysis**. *Journal of Near Infrared Spectroscopy*, 23, 0-0. 10.1255/jnirs.1141

- [SC 6]. **Herrero-Langreo A.**, Tisseyre B., Goutouly J.P., Scholasch T., Van Leeuwen C. **Mapping Grapevine (*Vitis vinifera* L.) Water Status during the Season Using Carbon Isotope Ratio ($\delta^{13}C$) as Ancillary Data** (2013). *American Journal of Enology and Viticulture*. 64 (3) 307-315. 10.5344/ajev.2013.12125
- [SC 5]. Diezma B., Lleó L., Roger J.M., **Herrero-Langreo A.**, Lunadei L., Ruiz-Altisent M.,(2013). **Examination of the Quality of Spinach Leaves Using Hyperspectral Imaging**, *Postharvest Biology and Technology*, 85, 8-17. 10.1016/j.postharvbio.2013.04.017.
- [SC 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, 10.1016/j.jfoodeng.2011.07.004.
- [SC 3]. Lleó L., Roger J.M., **Herrero-Langreo A.**, Diezma-Iglesias B., Barreiro P. (2011). **Comparison of Multispectral Indexes Extracted from Hyperspectral Images for the Assessment of Fruit Ripening**, *Journal of Food Engineering*, 104 (4) 612-620, 10.1016/j.jfoodeng.2011.01.028.
- [SC 2]. **Herrero-Langreo A.**, Lunadei L., Lleó L., Diezma B., Ruíz-Altisent M. (2011). **Multispectral Vision for Monitoring Fruit Ripeness**. *Journal of Food Science*. 76 (2) 178–187. 10.1111/j.1750-3841.2010.02000.x
- [SC 1] Lleó L., Barreiro P., Ruiz-Altisent M., **Herrero-Langreo A.** (2009). **Multispectral Images of Peach Related to Firmness and Maturity at Harvest**, *Journal of Food Engineering*, 93 (2) 229-235. 10.1016/j.jfoodeng.2009.01.028.

2. BOOK CHAPTERS

- [B.2] **Herrero-Langreo A.**, Scanell A., Gowen A. (2018). **Hyperspectral imaging for food related microbiology applications**. In JM. Amigo (Ed.). *Hyperspectral imaging Analysis and applications* (2019). Elsevier. 10.1016/B978-0-444-63977-6.00020-1
- [B.1] Hernández-Sánchez N., Moreda G., **Herrero-Langreo A.**, Melado-Herreros Á. (2016). **Assessment of Internal and External Quality of Fruits and Vegetables**. In N. Sozer (Ed.), *Imaging Technologies and Data Processing for Food Engineers* (pp. 269–309). Springer International Publishing. doi:10.1007/978-3-319-24735-9

3. CONFERENCE PRESENTATIONS

- [CP.39] Herrero-Langreo A., Iaconelli, S., Gowen A. **Effect of spectral pretreatments in distance classification of recyclable materials through Near Infrared hyperspectral imaging** . in *SWIIMS, 15 September 2022 Rome (Italy)*.
- [CP.38] Herrero-Langreo A., Xu J.L, Lamba S., Ferone M., Scannell A.G.M., Gowen A. **Detection of *Cronobacter sakasaki* biofilms on aluminium coupons through ultrafast FTIR spectral Imaging**. in *IASIM, 3-6 July. 2022. Esbjerg, (Denmark)*.
- [CP.37] Herrero-Langreo A., Xu J.L, Lamba S., Ferone M., Swanson A., Caponigro V., Scannell A.G.M., Gowen A. **Integration of visible and near infrared hyperspectral imaging for the detection of bacteria on food related surfaces..** in *22nd Workshop Hélio-SPIR, 28-29 Jun. 2022. Agropolis, Montpellier (France)*.
- [CP.36] Swanson A., Herrero-Langreo A., Lamba S., Ferone M., Xu J., Caponigro V., Scannell A.G.M., Gowen A. **Comparison of portable and benchtop spectral imaging in VNIR and SWIR spectral ranges for the characterization and identification of bacteria on food-related surfaces.** in *21th Workshop Hélio-SPIR, 24-25 Nov. 2021. Agropolis, Montpellier (France)*.
- [CP.35] Ana Herrero-Langreo, Falkovskaya, A., Ferone, M., Scannell, A. G.M. & Gowen, A. **Hierarchical classification of bacteria from hyperspectral Visible-NIR imaging of bacterial cultures on agar petri dishes.** in *WHISPERS 2021 (11th IEEE GRSS Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing)* 24-26 Mar. 2021. Online meeting
- [CP.34] Xu, J., Herrero-langreo, A. & Gowen, A. A. **Deep learning for pixel-wise classification of SWIR spectral images.** in *WHISPERS 2021 (11th IEEE GRSS Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing)* 24-26 Mar. 2021. Online meeting
- [CP.33] Herrero-Langreo, A. et al. **Orthogonal Projection As A Spectral Pre-Treatment Method To Reduce The Interference Of Polystyrene Signal In Nir Imaging Of Agar On Petri-Dishes.** in *2019 10th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS)* 1–4 (IEEE, 2019). doi:10.1109/WHISPERS.2019.8921398

- [CP.32] **Herrero-Langreo A.**, Tisseyre B., Gorretta N., Gowen A., Roger J.M. **Using spatial information to evaluate regression models for hyperspectral imaging: geostatistical indices.** Chimiométrie 2019. 31 Jan. – 1 Feb. 2019. Montpellier (France)
- [CP.31] Falkovskaya A., **Herrero-Langreo A.**, Chemburkar G., Scanell A., Gowen A. **Pre-processing of Near Infrared hyperspectral imaging of bacteria on agar petri dishes: Comparison of methods for the segmentation of Bacillus cereus cultures grown on Luria Bertani (LB) agar.** Chimiométrie 2019. 31 Jan. – 1 Feb. 2019. Montpellier (France).
- [CP.30] **Herrero-Langreo A.**, Ravindra Chemburkar G., Scanell A., Gowen A. **NIR imaging of agar on glass and plastic petri dishes: effects of sample presentation.** Hyperspectral Imaging and Applications Conference. 10-11 Oct. 2018. Coventry (U.K).
- [CP.29] **Herrero-Langreo A.**, Ravindra Chemburkar G., Scanell A., Gowen A. **Characterization of food-borne bacteria on culture media by multiple modalities of hyperspectral imaging.** XVII Chemometrics in Analytical Chemistry CAC 2018, 25-19 Jun. 2018. Halifax (Canada).
- [CP.28] **Herrero-Langreo A.**, Scanell A., Gowen A. **Potential of Hyperspectral Imaging to Identify Food Pathogens & Food Spoilers.** Innovative Strategies to Promote Food Safety in the Irish Food Industry UCD Institute of Food and Health. 8 May 2018. Dublin (Ireland)
- [CP.27] **Herrero-Langreo A.**, Tisseyre B., Gorretta N., Nouri M., Bendoula R., Roger J.M., **Prediction maps as a tool to detect model overfitting on hyperspectral images, a geostatistical approach.** Chimiométrie XVIII 2017, 30 Jan-1 Feb. 2017. Paris (France).
- [CP.26] **Herrero-Langreo A.**, Diezma B., Lleó L., Gorretta N., Boiret M., Cuadrado T., Barreiro P., Roger J.M., **An iterative procedure for detecting foreign products in powder foods in NIR hyperspectral imaging spectroscopy: frauds and contaminations.** Hyperspectral Imaging and Applications Conference 2016, 12-13 Oct. 2016. Coventry (U.K.).
- [CP.25] **Herrero-Langreo A.**, Tisseyre B., Gorretta N., Nouri M., Bendoula R., Roger J.M., **A Geostatistical Approach for Evaluating Prediction Maps from Hyperspectral Images.** XVI Chemometrics in Analytical Chemistry CAC 2016, 6-10 Jun. 2016. Barcelona (España).
- [CP.24] **Herrero-Langreo A.**, Bendoula R., Gobrecht A., Ducanhez A., Guerrero-Castro P., Roger J.M., **Prediction of Soluble Solids Content in Intact Sugar Beet: a Preliminary Study for a Fiber-optic Probe Sensor.** Chimimetrie XVII, 17-20 Jan. 2016. Namur (Belgique).
- [CP. 23] Bendoula R., Gobrecht A., Guerrero Castro P., **Herrero-Langreo A.**, Roger. J.M., **The Potential of a Invasive but Non Destructive, Fiber-optic Probe for Soluble Solid Content Prediction, in Whole Sugar Beet .** 17th International Conference on Near Infrared Spectroscopy - NIR 2015, 18- 23 Oct. 2015. Iguassu (Brazil).
- [CP. 22] Mishra P., **Herrero-Langreo A.**, Roger J.M., Gorretta N., Lleó L., Diezma B., Barreiro P. **Detection of Peanut Traces in Wheat Flour Through NIR Hyperspectral Imaging Spectroscopy.** Hyperspectral Imaging and Applications Conference, 15-16 Oct. 2014. Ricoh Arena, Coventry (U.K.).
- [CP. 21] **Herrero-Langreo A.**, Mishra P., Roger J.M., Gorretta N., Lleó L., Diezma B., Barreiro P. **Multispectral Imaging for Detection of Foreign Food Material in Powder Food.** Hyperspectral Imaging and Applications Conference, 15-16 Oct. 2014. Ricoh Arena, Coventry (U.K.).
- [CP. 20] Deyme R. , **Herrero-Langreo A.**, Roger J.M., Bendoula R. **Mapping Sugar Content in Beetroots.** 16th International Conference on Near Infrared Spectroscopy, 2-7 Jun. 2013. La Grande Motte (France)
- [CP. 19] **Herrero-Langreo A.** , Tisseyre B. , Roger J.M. , Scholasch T. **How to Sample to Calibrate a Spatial Model: Application for Modeling Vine Water Status.** IX International Terroir Congress, 25 - 29 Jun. 2012. Dijon (France)
- [CP. 18] Diezma-Iglesias B., Lleó L., **Herrero-Langreo A.**, Lunadei L., Roger J.M., Ruiz-Altisent M. **Hyperespectral Images for the Evaluation of the Quality of Minimally Processed Vegetables.** XII Rencontres Hélio-SPIR, 30 Sep. 2011. Agropolis, Montpellier (France).
- [CP. 17] Correa Farias C., Moya-Gonzalez A., Báguena Iglesias E., **Herrero-Langreo A.**, Diago M.P., Baluja J., Tardáguila J., Valero C., Barreiro P. **Extracción de Características de la Cubierta Vegetal del Viñedo mediante Imágenes RGB y RGIR Obtenidas de Forma Dinámica.** VI Congreso Ibérico de AgroIngeniería, 5 -7 Sep. 2011. Evora (Portugal).
- [CP. 16] Lleó L., Roger J.M., **Herrero-Langreo A.**, Diezma-Iglesias B., Barreiro P., **Comparación de Índices Ópticos de**

- Imágenes Hiperespectrales en Relación con Madurez de Melocotón.** VI Congreso Ibérico de AgroIngeniería, 5 -7 Sep. 2011. Evora (Portugal).
- [CP. 15] Tardaguila J., **Herrero-Langreo A.**, Barreiro P., Valero C., Poni S., Diago M.P. **Using RGB Image Analysis to Assess the Impact of Early Defoliation on the Fruit Zone.** **Proceedings 17th International Symposium GiESCO (189-191),** 29 Ago - 2 Sep. 2011. Asti-Alba (Italia).
- [CP. 14] Scholasch T., Soufflet B., **Herrero-Langreo A.**, Payen S. **A Study of the Relationship between Daily Rate of Vine Water Use and Fruit Composition,** 20 - 24 Jun. 2011. 62 ASEV National Conference. Monterey, California. (USA)
- [CP. 13] **Herrero-Langreo A.**, Barreiro P., Diago M.P., Baluja J., Ochagavia H., Tardaguila J. **Pixel Classification through Mahalanobis Distance for Identification of Grapevine Canopy Elements on RGB Images.** International Association for Spectral Imaging Conference (IASIM-10), 18 - 19 Nov. 2010. Dublin (Ireland).
- [CP. 12] **Herrero-Langreo A.**, Fernández-Ahumada E., Palagos B., Roger J.M., Lleó L., Diezma-Iglesias B., Ruiz-Altisent M. **Combination of Optical and Mechanical Techniques for the Measurement of Maturity and Firmness in Peaches.** 28th International Horticultural Congress, 22 - 27 Ago. 2010. Lisboa (Portugal).
- [CP. 11] **Herrero-Langreo A.**, Moya-González A., Hernández-Sánchez N., Ruiz-Altisent M. **Medidas No Destructivas al Servicio de Programas de Mejora Genética: SS en Cebollas (NIR), Madurez en Melocotón (VIS/NIR e Imagen Multiespectral) y Calidad en Aceitunas (NMR).** V Congreso de Mejora Genética de plantas, 8 - 21 Jul. 2010. Madrid (España).
- [CP. 10] **Herrero-Langreo A.**, Fernandez-Ahumada E., Roger J.M., Palagos B., Lleó L. **Prediction of Destructive Properties Using Descriptive Analysis of ND Measurements.** VII Colloquium Chemiometricum Mediterraneum, 21 - 24 Jun. 2010. Granada (España).
- [CP. 9] Lleó L., Diezma-Iglesias B., Roger J.M., **Herrero-Langreo A.** **Hyperspectral Imaging for Peach Ripening Assessment.** VII Colloquium Chemiometricum Mediterraneum, 21 - 24 Jun. 2010. Granada (España).
- [CP. 8] Grant O.M., Davies M.J., Longbottom H., **Herrero A.**, Harrison-Murray R. **Application of RDI to Controlling Growth of Hardy Nursery Stock.** VI International Symposium on Irrigation of Horticultural Crops, 2 - 6 Nov. 2009. Viña del Mar (Chile).
- [CP. 7] **Herrero A.**, Fernández-Ahumada E., Palagos B., Roger J.M., Lleó L. Ruíz-Altisent M. **The Use of Optical and ND Mechanical Techniques for the Measurement of Maturity and Firmness in Peach.** 4th ISAFRUIT General Assembly, 26 - 29 Oct. 2009. Angers (France).
- [CP. 6] **Herrero A.**, Diezma B., Lleó L., Ruiz-Altisent M. **Evaluación de Técnicas Acústicas para la Determinación de Firmeza en Melocotón.** Actas de V Congreso Nacional de Agroingeniería, 28 - 30 Sep. 2009. Lugo (España).
- [CP. 5] **Herrero A.**, Lunadei L., Lleó L., Diezma-Iglesias B., Cordier E., Barreiro P., Ruiz-Altisent M. **Multispectral Images for Monitoring Fruit Ripeness: Validation Methods.** International Conference on Agricultural Engineering and Industry Exhibition, 23 - 25 Jun. 2008. Hersonissos, Crete (Greece).
- [CP.4] **Herrero A.**, Lleó L., Diezma B., Barreiro P., Ruíz-Altisent M., Riquelme F. **Multispectral Images of Peach Related to Firmness and Maturity at Harvest.** 7th International Peach Symposium, 8 - 11 Jun. 2009. Lleida (España).
- [CP. 3] Lleó L., Diezma B., **Herrero A.**, Ruiz-Altisent M., Valero C., Riquelme F. **Peach Consumers' Quality Prediction Using Vision, Spectral Reflectance, Acoustic and Impact Sensors.** International Conference on Agricultural Engineering and Industry Exhibition, 23 - 25 Jun. 2008. Hersonissos, Crete (Greece).
- [CP. 2] Lleó L., Diezma B., Ruiz-Altisent M., **Herrero A.**, Valero C., Barreiro P., Riquelme F., Ortiz-Cañavate J. **Multispectral Vision and Mechanical Sensors for Peach Quality Inspection.** 3rd CIGR Section VI International Symposium on Food and Agricultural Products: Processing and Innovations, 24 - 27 Sep. 2007. Napoli (Italia).
- [CP. 1] **Herrero A.**, Lleó L., Valero C., Ruíz-Altisent M., Riquelme F. **Evaluación de Técnicas No Destructivas para la Caracterización de Firmeza en Melocotón.** Congreso Nacional de Agroingeniería, 4-6 Sep. 2007. Albacete (España)