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Manuel Pérez-Ruiz

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Profile.

Dr. Manuel Pérez-Ruiz is a full professor at the University of Seville, Spain. Initiating his research journey in 2001, he was an integral part of precision agriculture advancements within the research group at KU Leuven's Department of Biosystems in Belgium. His collaboration with Professor David C. Slaughter at the University of California at Davis from 2008 to 2014 further solidified his standing in agricultural technology. With a career spanning over two decades dedicated to developing and applying sensors and instrumentation for agricultural machinery, GNSS, variable application techniques, and intelligent systems, his work has been pivotal in revolutionizing weed control and reducing the costs of agricultural operations. He has devoted considerable effort to transferring knowledge and the on-farm demonstration of precision strategies and technologies, ensuring that research outcomes benefit the farming community directly. Since 2019, he has been at the helm of the Smart Biosystems Laboratory at the University of Seville. Under his leadership, this research group of 20 researchers pursues projects with a European scope. This role provides him with a deep understanding of the varied agronomic and technological systems across Europe and insight into the specific needs of the region's agriculture sector.

Education.

Ph.D. Agricultural Engineering University of Cordoba 2007

B.A. & M.S. Agricultural Engineering University of Cordoba 2002

Professional experience.

2021 to present Full Professor, Department of Aerospace Engineering and Fluid Mechanics, University of Sevilla.

2017 to 2021 Professor, Department of Aerospace Engineering and Fluid Mechanics, University of Sevilla

2013 to 2017 Associate Professor, Department of Aerospace Engineering and Fluid Mechanics, University of Sevilla

2010 to 2013 Assistant Professor/Lecturer, Department of Aerospace Engineering and Fluid Mechanics, University of Sevilla

2007 to 2010 Teaching Assistant, Department of Aerospace Engineering and Fluid Mechanics, University of Sevilla

Recent publications.

Sánchez-Fernández, L., Barrera, M., Martínez-Guanter, J., **Pérez-Ruiz**, M. 2023. Drift reduction in orchards through the use of an autonomous UAV system. Computers and Electronics in Agriculture, Vol. 211, 107981.

Gallardo-Romero, D.J., Apolo-Apolo, O.E., Martínez-Guanter, J., **Pérez-Ruiz**, M. 2023. Multilayer data and artificial intelligence for the delineationof homogeneous management zones in maize cultivation. Remote Sensing, Vol. 15(12), 3131.

P. Castro-Valdecantos, O.E. Apolo-Apolo, **M. Pérez-Ruiz**, G. Egea. 2022. Leaf area index estimations by deep learning models using RGB images and data fusion in maize. Precision Agriculture, Vol. 23(6), 1949-1966

M. Pérez-Ruiz, D.C. Slaughter. 2021. Development of a precision 3-row synchronized transplanter. Biosystems Engineering, Vol. 206, Pages 67-78.

Perez-Ruiz, M., Martínez-Guanter, J., Upadhyaya, S. K. 2021. High-precision GNSS for agricultural operations. In GPS and GNSS Technology in Geosciences (pp. 299-335). Elsevier.

Apolo-Apolo, O.E.; Martínez-Guanter, J.; Egea, G.; Raja, P.; **Pérez-Ruiz, M.** 2020. Deep learning techniques for estimation of the yield and size of citrus using a UAV. European Journal of Agronomy, 115, 126030.

Pérez-Ruiz, M.; Prior, A.; Martinez-Guanter, J.; Apolo-Apolo, O.E.; Andrade-Sanchez, P.; Egea, G. 2020. Development and evaluation of a self-propelled electric platform for high-throughtput field phenotyping in wheat breeding trials. Computers and Electronics in Agriculture, 169, 105237.

Pérez-Ruiz, M., Brenes, R., Urbano, J.M., Slaughter, D.C., Forcella, F., Rodríguez-Lizana, A. 2018. Agricultural residues are efficient abrasive tools for weed control. Agronomy for Sustainable Development, 38, 18.

Recent research projects.

Cooperation for Upskilling and Building Regional Ecosystems in Sustainable Precision (VTskills). 2024. PI: Manuel Pérez-Ruiz; Funding: 1.198.871,00 €

Andalucía Agrotech Digital Innovation Hub. 2023. PI: Manuel Pérez-Ruiz; Funding: 120.000,00 €

Advances in terrestrial high-throughput phenotyping to enhance wheat breeding against biotic and abiotic stresses (PHEWHEAT). 2022. PI: Manuel Pérez-Ruiz; Funding: 163.350,00 €

LiDAR and hyperspectral measurements for the determination of wheat rust severity and its impact on crop yield (ROBIGUS). 2021. PI: Manuel Pérez-Ruiz; Funding: 98.000,00 €

Patents.

GPS-controlled automatic lateral displacement device for weed control in line crops. International Patent-PCT/ES2012/000289

GPS-controlled portable spray application equipment for educational and research use. International Patent-PCT/201300493

Awards.

Losada Villasante Award for Excellence in Research in the Agrifood Area (May 2016), €6,000.00. For his research on "Intelligent equipment for the localized application of herbicides", aided by aerial inspection (drones).

EurAgEng Outstanding Paper Awards 2016. "Co-robotic intra-row weed control system" Best article published in Biosystems Engineering magazine during 2014 and 2015.

EurAgEng Outstanding Paper Adwards 2014. "Tractor-based Real-time Kinematic-Global Positioning System (RTK-GPS) guidance system for geospatial mapping of row crop transplant" published in Biosystems Engineering magazine during 2012 and 2013.