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**Prof. Dr. Eng. José Luis Lerma**

Professor, Department of Cartographic Engineering, Geodesy and Photogrammetry, School of Engineering in Geodesy, Cartography and Surveying, Universitat Politècnica de València (UPV), Spain.

Coordinator of the PhD Programme in Geomatics Engineering at the UPV.

Head of the Photogrammetric & Laser Scanning Research Group (GIFLE, UPV).

**Qualifications**

- Technical Engineer in Surveying (Bachelor). UPV. 1992.
- Engineer in Geodesy and Cartography (Master). UPV. 1996.
- Doctor in Geodesy and Cartography (PhD). UPV. 1999.

**General indicators of the quality of scientific production**

Six-term research periods recognised, 4; PhD supervisor, 12; Citations, 2605; h-index = 25; i10 index = 64; Research papers in journals, 85; Proceedings in congresses, 100; Participation in research projects & contracts, 55 (Principal Investigator, PI, 31).

**Academic Appointments:**

- Department of Cartographic Eng., Geodesy and Photogrammetry. Teaching at the UPV:
  - Reader: Part-time, Oct. 1996–Sep. 1997; Full-time, Oct. 1997–Sep. 2000.
  - Assistant Professor: Oct. 2000–Mar. 2003 • Associate Professor: Mar. 2003–Oct. 2017.
  - Full Professor: November 2017 – Present.
- Abroad:
  - Guest Professor in U. Gävle-Sandiken. Gävle, Sweeden. 1998.
  - Visiting Professor: TU Wien, Austria, 2000; U. Hannover, Germany, 2001; N. U. San Juan, 2001; U. Stuttgart, 2002; N. U. La Plata, Argentina. 2003; Master of Science in Geomatics, U. Applied Sciences. Karlsruhe, Germany, 2007 – Present.
  - Postdoctoral Fellow at Digital Design Studio, Glasgow School of Arts, Glasgow, UK. August-October 2013.
  - External Examiner:
    - BSc Degree in Geomatics, School of Surveying and Construction Management, College of Engineering and Built Environment, Dublin Institute of Technology, Ireland. Nov. 2015 – 2018.
    - MSc in Geospatial Engineering & MSc in Geographic Information Science College of Engineering and Built Environment, Dublin Institute of Technology, Ireland. Sep. 2016 – 2019.
  - Consultant:
    - EU/Colombia. Project: “Enhance of the Cartographic Systems in Colombia Land”. Agustín Codazzi Geographic Institute, Bogotá. 2006;
    - United Nations Development Programme (UNDP). Project “Photogrammetric Documentation for Muharraq and Manama Urban Design Pilot Projects”, Bahrain. 2006;
    - The Getty Conservation Institute. LA, USA. Project “Documentation for Conservation”. 2006;
    - Center for Lithospheric Studies, The University of Texas at Dallas. Project: “Photorealistic modelling of outcrops integrating close range photogrammetry and terrestrial laser scanning”. Texas, USA, 2009;
    - World Monuments Fund. Project: ‘Qusayir Amra Thermographic Survey’. Jordan, 2011.



- EU/Panamá. Project: "Use and handling of LiDAR technology". Tommy Guardia National Geographic Institute, Panamá, 2012.
- EU/Caracas. Project: "CARCAVEN Training project on LiDAR technology". Simón Bolívar Venezuela Geographic Institute, Caracas, 2012.
- Instituto del Patrimonio Cultural de España (IPCE): Microphotogrammetric monitoring on several control areas in Altamira Cave, Santillana del Mar, 2013.

#### **Research Funding Awards:**

- REVealing hIddEn Wall paintings — REVIEW. H2020-MSCA-IF-2020 (101032333).
- Non-invasive and low-cost analysis and monitoring of cranial deformation in infants by means of 3D photogrammetry and smartphones. PI: 2019-2021.
- Low-cost photogrammetry to monitor cranial deformation. PI: 2017-2018.
- Spectrophotometric analysis and camera calibration applied to the study of rock art. PI: 2014-2016.
- Automatic photorealistic 3D modelling applied to cultural heritage. PI: 2011-2013.
- Study, integral documentation and elaboration of a management plan for the Covatina del Tossalet del Mas de la Rambla shelter or Barranc de les Carabasses shelter (Villafranca, Castelló). Co-I: 2013-2014.
- Ahead of history: origin and consolidation of Valencian Palaeolithic settlements. Co-I: 2013-2016.
- Thermography and 3D Documentation of the Djin Block No. 9 in Petra (Jordan). PI: 2009-2011.
- Development of an architectural information system for the automatic modelling, documentation and multimedia visualization of cultural heritage. PI: 2005-2008.
- Documentation and exhaustive mapping, by automatic methods, of the alterations in architectural monuments. PI: 2000-2002.
- Integral study, documentation and conservation of the set of Palaeolithic engravings in the Meravelles Cave (Gandia).
- 3DRISK MAPPING. Learning tools for advanced three-dimensional surveying in risk awareness. Leonardo da Vinci educational project. 2006-2008. Co-I.
- Development of applications in digital photogrammetry. PI.
- Archaeological Syrian-Spanish Mission in the Euphrates middle valley (Deir ez-Zor). Three years project. Ministry of Culture, CSIC. Co-I.
- 3D Reconstruction of the presbytery in the Cathedral of Valencia. PI.
- Development of a client application of an aerial management system. PI.
- Development and implementation of algorithms for architectural photogrammetry. PI.
- Consulting for application development of tools for solving out cartographic management systems. PI.
- Requena Web cultural project by means of cartography and photography. PI.
- Consulting for the virtual streetwalker. PI.
- Anthropometric analysis of the cranial deformation by means of 3D photogrammetric solutions. PI.

#### **Member of Scientific Committees:**

- ICOMOS/ISPRS CIPA Heritage Documentation. Member of the Executive Board (since Jan 1, 2007). Current Treasurer.
- Virtual Systems and Multimedia (VSMM).
- ICOMOS Spain.
- Spanish Society of Virtual Archaeology.
- Spanish Association of Surveying Engineering..

#### **Reviewer of the scientific journals:**



- Applied Geomatics.
- Applied Mathematics and Computation.
- Arqueología de la Arquitectura.
- Automation in Construction.
- Computers & Geosciences.
- Computers & Graphics.
- Construction and Building Materials.
- Digital Applications in Archaeology and Cultural Heritage.
- DYNA.
- Geoinformatics FCE CTU.
- International Journal of Heritage in the Digital Era.
- ISPRS Journal of Photogrammetry and Remote Sensing.
- Journal of Archaeological Science.
- Journal of Archaeological Method and Theory.
- Journal of Cultural Heritage.
- Journal of Surveying Engineering.
- Measurement.
- Nondestructive Testing and Evaluation.
- Photogrammetric Engineering and Remote Sensing (PE&RS).
- Photogrammetrie - Fernerkundung - Geoinformation (PFG).
- Remote Sensing.
- Remote Sensing Letters.
- Scientific Research and Essays.
- Sensors.
- The Photogrammetric Record.

**Director of International Congress:**

- 9<sup>th</sup> ARQUEOLÓGICA 2.0 & 3<sup>rd</sup> GEORES 2021. Online international event. Apr. 26-28, 2021.
- 8<sup>th</sup> ARQUEOLÓGICA 2.0 - International Congress on Archaeology, Computer Graphics, Cultural Heritage and Innovation. Valencia (Spain). Sep. 5-7, 2016.
- International Workshop on the Application of Terrestrial Laser Scanning for Risk Mapping. Valencia (Spain), 2011.

**Editor of Scientific Journals:**

- [Virtual Archaeology Review](#). Q1 in SJR & Scopus. Editor-in-Chief. Oct. 2015 – Present.
- [Remote Sensing](#). Q2, SJR & Q1, Scopus. Co-Guest Editor. Special Issue "Remote Sensing, Metric Survey and Spatial Information Technologies for Heritage Management". 2021.

**Reviewer of Research Projects:**

- ACIE, Spain.
- Agencia Andaluza del Conocimiento, Spain.
- ANEP, Spain.
- Fonds Wetenschappelijk Onderzoek (FWO), Belgium.
- Vienna Science and Technology Fund (WWTF), Austria.
- HERCULES Program for Medium-Sized Research Infrastructure, Association University Ghent, Belgium.
- FONARSEC (Argentina).
- FULBRIGHT (USA).
- FULBRIGHT - Aalto University Distinguished Chair, Finland.
- Ministero dell'Istruzione, dell'Università e della Ricerca (MIUR), Italy.



- National Research Foundation, South Africa.
- Politecnico di Torino.
- Università Politecnica delle Marche
- World Monuments Watch.
- Xunta de Galicia, Spain.

#### Main publications:

- Lerma, J. L., *Multiband versus Multispectral Supervised Classification of Architectural Images*. The Photogrammetric Record, 17(97): 89-101, 2001.
- Lerma, J. L., Vidal, Jesús, Portalés, C., *Three-Dimensional City Model Visualisation for Real-Time Guided Museum Tours*. The Photogrammetric Record, 19(108): 360-374, 2004.
- Lerma, J. L., *Automatic Plotting of Architectural Facades with Multispectral Images*. Journal of Surveying Engineering (ASCE), 131(3): 73-77, 2005.
- Lerma, J. L., Cabrelles, M., *A Review and Analyses of Plumb-Line Calibration*. The Photogrammetric Record, 22(118): 135-150, 2007.
- Biosca, M., Lerma, J. L., *Unsupervised robust planar segmentation of terrestrial laser scanner point clouds based on fuzzy clustering methods*. ISPRS Journal of Photogrammetry and Remote Sensing, 63(1): 84-98, 2008.
- Seguí, A. E.; Lerma, J. L.; Navarro, S.; Portalés, C., *On-the-Fly Server-Based Aerial Imagery Management System*. The Photogrammetric Record, 24(127): 280-294, 2009.
- Baselga, S.; García-Asenjo, L.; Garrigues, P.; Lerma, J. L., *Inertial navigation system data filtering prior to GPS/INS integration*. The Journal OF Navigation, 62(4): 711-720, 2009.
- Scherer, M.; Lerma, J. L., *From the conventional total station to the prospective image assisted photogrammetric scanning total station: comprehensive review*. Journal of Surveying Engineering, 135(4): 173-178, 2009.
- Portalés, C.; Lerma, J. L.; Pérez, C., *Photogrammetry and augmented reality for cultural heritage applications*. The Photogrammetric Record, 24(128): 316-331, 2009.
- Portalés, C.; Lerma, J. L.; Navarro, S., *Augmented reality and photogrammetry: a synergy to visualize physical and virtual city environments*, ISPRS Journal of Photogrammetry and Remote Sensing, 65(1): 134-142, 2010.
- Lerma, J. L.; Navarro, S.; Cabrelles, M.; Villaverde, V., *Terrestrial laser scanning and close range photogrammetry for 3D archaeological documentation: the upper Palaeolithic cave of Parpalló as a case study*. Journal of Archaeological Science, 37(3): 499-507, 2010.
- Lerma, J. L.; Navarro, S.; Cabrelles, M.; Seguí, A. E., *Camera calibration with baseline distance constraints*. The Photogrammetric Record, 25(130): 140-158, 2010.
- Lerma, J. L., *Heritage recording using image-based techniques*, Multi-Science Co.: Heritage in the Digital Era (Marinos Ioannides, Addison Alonzo, Andreas Georgopoulos, Loukas Kalisperis, Andre Brown, Denis Pitzalis, Eds.), 83-93 pp., 2010.
- Lerma, J. L.; Cabrelles, M.; Portalés, C., *Multitemporal thermal analysis to detect moisture on a building façade*. Construction and Building Materials, 25(5): 2190-2197, 2011.
- Lerma, J. L.; Navarro, S.; Cabrelles, M.; Seguí, A.E.; Haddad, N.; Akasheh, T., *Integration of laser scanning and imagery for photorealistic 3D architectural documentation*. InTech: Laser Scanning, Theory and Applications (ISBN 978-953-307-205-0). Chau-Chang Wang (Ed.), 414-430 pp., 2011.
- Duca, F.; Cabrelles, M.; Navarro, S.; Seguí, A.E.; Lerma, J. L., *Photo-realistic 3d modelling of sculptures on open-air museums*. Geoinformatics Ctu Fce, 1(2): 236-250, 2011.



- Lerma, J. L.; Akasheh, T.; Haddad, N.; Cabrelles, M., *Multispectral sensors in combination with recording tools for cultural heritage documentation*. *Change Over Time*, 1(2): 236-250, 2011.
- González-Aguilera, D.; Rodríguez-Gonzálvez, P.; Hernández-López, D.; Lerma, J. L., *A robust and hierarchical approach for the automatic co-registration of intensity and visible images*. *Optics & Laser Technology*, 44(6): 1915-1923, 2012.
- Hernández-López, D.; Cabrelles, M.; Felipe-García, B.; Lerma, J. L., *Calibration and Direct Georeferencing Analysis of a Multi-Sensor System for Cultural Heritage Recording*. *Photogrammetrie, Fernerkundung, Geoinformation*, 3: 237-250, 2012.
- Lerma, J. L.; Cabrelles, M.; Akasheh, T.; Haddad, N., *Documentation of weathered architectural heritage with visible, near infrared, thermal and laser scanning data*. *International Journal of Heritage in the Digital Era*, 1(2): 251-275, 2012.
- Riutort-Mayol, G.; Marqués-Mateu, A.; Seguí, A.; Lerma, J. L., *Grey Level and Noise Evaluation of a Foveon X3 Image Sensor: A Statistical and Experimental Approach*. *Sensors*, 12(8): 10339-10368, 2012.
- Balsa-Barreiro, J.; Avariento, J.P.; Lerma, J. L., *Airborne light detection and ranging (LiDAR) point density analysis*. *Scientific Research and Essays*, 7(33): 3010-3019, 2012.
- Felipe-García, B.; Hernández-López, D.; Lerma, J. L., *Analysis of the ground sample distance on large photogrammetric surveys*. *Applied Geomatics*, 4(4): 231-244, 2012.
- Seguí, A.E.; Portalés, C.; Cabrelles, M.; Lerma, J. L., *Geographic Information Systems: concepts, advantages and possibilities in the field of restoration*. *LOGGIA: Arquitectura y Restauración*, 24-25: 208-212, 2012.
- Marqués-Mateu, A.; Lerma, J. L.; Riutort-Mayol, G., *Statistical Grey Level and Noise Evaluation of Foveon X3 and CFA Image Sensors*. *Optics and Laser Technology*, 48:1-15, 2013.
- Lerma, J. L.; Navarro, S.; Cabrelles, M.; Seguí, A.E.; Hernández, D., *Automatic orientation and 3D modelling from markerless rock art imagery*. *ISPRS Journal of Photogrammetry and Remote Sensing*, 76: 64-75, 2013.
- Piatti, E.J.; Lerma, J. L., *Virtual Worlds for Photogrammetric Image-Based Simulation and Learning*. *The Photogrammetric Record*, 28(141): 27-42, 2013.
- Domingo, I.; Villaverde, V.; López-Montalvo, E.; Lerma, J.L.; Cabrelles, M., *Latest developments in rock art recording: Towards an integral documentation of Levantine rock art sites combining 2D and 3D recording techniques*. *Journal of Archaeological Science*, 40(4): 1879-1889, 2013.
- García-San-Miguel, D.; Lerma, J. L., *Geometric calibration of a terrestrial laser scanner with local additional parameters: An automatic strategy*. *ISPRS Journal of Photogrammetry and Remote Sensing*, 79:122-136, 2013.
- Lerma, J.L.; Cabrelles, M.; Navarro, S.; Fabado, S., *From Digital Photography to Photogrammetry for Cultural Heritage Documentation and Dissemination*, *Disegnarecon*, 6(12): 1-8, 2013.
- Balsa-Barreiro, J.; Lerma, J.L., *A new methodology to estimate the discrete-return point density on airborne lidar surveys*. *International Journal of Remote Sensing*, 35(4): 1496-1510, 2014.
- Lerma, J.L.; Navarro, S.; Seguí, A.; Cabrelles, M., *Range-based versus automated markerless image-based techniques for rock art documentation*. *The Photogrammetric Record*, 29(145): 30-48, 2014.
- Piatti, E.J.; Lerma, J.L., *Generation of true ortho-images based on virtual worlds: learning aspects*. *The Photogrammetric Record*, 29(145): 49-67, 2014.
- Balsa-Barreiro, J.; Lerma, J.L., *Empirical study of variation in lidar point density over different land covers*. *International Journal of Remote Sensing*, 35(9): 3372-3383, 2014.



- Lerma, J.L.; Muir, C., *Evaluating the 3D documentation of an early Christian upright stone with carvings from Scotland with multiples images*. Journal of Archaeological Science, 46: 311-318, 2014.
- Boochs, F.; Trémeau, A.; Murphy, O.; Gerke, M.; Lerma, J. L.; Karmacharya, A.; Karaszewski, M., *Towards a knowledge model bridging technologies and applications in cultural heritage documentation*. ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences, II-5: 81-88, 2014.
- Lerma, J. L.; García-San-Miguel, D., *Self-calibration of terrestrial laser scanners: selection of the best geometric additional parameters*. ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences, II-5: 219-226, 2014.
- Sánchez-Lopera, J.; Lerma, J.L., *Classification of lidar bare-earth points, buildings, vegetation, and small objects based on region growing and angular classifier*. International Journal of Remote Sensing, 35(19): 6955-6972, 2014.
- Domingo, I.; Carrión, B.; Blanco, S.; Lerma, J.L., *Evaluating conventional and advanced visible image enhancement solutions to produce digital tracings at el Carche rock art shelter*. Digital Applications in Archaeology and Cultural Heritage, 2(2-3): 79-88, 2015.
- Haddad, N. A.; Akasheh, T. S.; Lerma, J. L.; Khresat, B. R., *Towards a Risk Management and Conservation Plan for the Djin Blocks at the World Heritage Site of Petra, Jordan: The Case of Djin Block No. 9*. Conservation and Management of Archaeological Sites, 17(2): 175-191, 2015.
- Navarro, S.; Lerma, J. L., *Accuracy analysis of a mobile mapping system for close range photogrammetric projects*. Measurement, 93: 148-156, 2016.
- Barbero-García, I.; Lerma, J. L.; Marqués-Mateu, Á.; Miranda, P., *Low-Cost Smartphone-Based Photogrammetry for the Analysis of Cranial Deformation in Infants*. World Neurosurgery, 102: 545-554, 2017.
- Balaguer-Puig, M.; Marqués-Mateu, Á.; Lerma, J. L.; Ibáñez-Asensio, S. *Estimation of small-scale soil erosion in laboratory experiments with Structure from Motion photogrammetry*. Geomorphology, 295: 285-296, 2017.
- Balaguer-Puig, M.; Marqués-Mateu, Á.; Lerma, J. L.; Ibáñez-Asensio, S. *Quantifying small-magnitude soil erosion: Geomorphic change detection at plot scale*. Land Degradation & Development, 2017
- Molada-Tebar, A.; Lerma, J. L.; Marqués-Mateu, Á., *Camera characterization for improving color archaeological documentation*. Color Research & Application, 43(1): 47-57, 2018.
- Lerma, J. L.; Barbero-García, I.; Marqués-Mateu, Á.; Miranda, P. *Smartphone-based video for 3D modelling: Application to infant's cranial deformation analysis*. Measurement, 116: 299-306, 2018.
- Barbero-García, I., Cabrelles, M., Lerma, J.L., Marqués-Mateu, Á., 2018. *Smartphone-based close-range photogrammetric assessment of spherical objects*. The Photogrammetric Record, 33(162): 283-299.
- Cabrelles, M., Blanco-Pons, S., Carrión-Ruiz, B., Lerma, J.L., 2018. *From Multispectral 3D Recording and Documentation to Development of Mobile Apps for Dissemination of Cultural Heritage*. In: T. E. Levy & I. W. N. Jones (Eds.), Cyber-Archaeology and Grand Narratives: Digital Technology and Deep-Time Perspectives on Culture Change in the Middle East (pp. 67-90). Cham: Springer International Publishing AG.
- Barbero-García, I., Lerma, J.L., Miranda, P., Marqués-Mateu, Á., 2019. *Smartphone-based photogrammetric 3D modelling assessment by comparison with radiological medical imaging for cranial deformation analysis*. Measurement, 131: 372-379.
- Blanco-Pons, S., Carrión-Ruiz, B., Lerma, J.L., 2019. *Augmented reality application assessment for disseminating rock art*. Multimedia Tools and Applications, 78(8): 10265-10286.



- Blanco-Pons, S., Carrión-Ruiz, B., Lerma, J.L., Villaverde, V., 2019. *Design and implementation of an augmented reality application for rock art visualization in Cova dels Cavalls (Spain)*. Journal of Cultural Heritage.
- del Hoyo-Meléndez, J.M., Carrión-Ruiz, B., Riutort-Mayol, G., Lerma, J.L., 2019. *Lightfastness assessment of Levantine rock art by means of microfading spectrometry*. Color Research Application, 1-9.
- Domingo, I., García-Argüelles, P., Nadal, J., Fullola, J.M., Lerma, J.L., Cabrelles, M., 2019. *Humanizing European Paleolithic art: A new visual evidence of human/bird interactions at L'Hort de la Boquera site (Margalef de Montsant, Tarragona, Spain)*. L'Anthropologie, 123(1):1-18.
- Barbero-García, I., Lerma, J.L., Mora-Navarro, G., 2020. [Fully automatic smartphone-based photogrammetric 3D modelling of infant's heads for cranial deformation analysis](https://doi.org/10.1016/j.isprs.2020.06.013). ISPRS Journal of Photogrammetry and Remote Sensing, 166, 268-277. <https://doi.org/10.1016/j.isprs.2020.06.013>
- Cabrelles, M., Lerma, J.L., Villaverde, V., 2020. [Macro Photogrammetry & Surface Features Extraction for Paleolithic Portable Art Documentation](https://doi.org/10.3390/app10196908). Applied Sciences, 10(19), 6908. <https://doi.org/10.3390/app10196908>
- Molada-Tebar, A., Marqués-Mateu, Á., Lerma, J.L., Westland, S., 2020. [Dominant color extraction with k-means for camera characterization in cultural heritage documentation](https://doi.org/10.3390/rs12030520). Remote Sensing, 12(3), 520. <https://doi.org/10.3390/rs12030520>
- Riutort-Mayol, G., Gómez-Rubio, V., Lerma, J.L., del Hoyo-Meléndez, J., 2020. [Correlated Functional Models with Derivative Information for Modeling Microfading Spectrometry Data on Rock Art Paintings](https://doi.org/10.3390/math8122141). Mathematics, 8(12), 2141. <https://doi.org/10.3390/math8122141>
- Riutort-Mayol, G., Gómez-Rubio, V., Marqués-Mateu, A., Lerma, J.L., López-Quílez, A., 2020. [A Bayesian multilevel random-effects model for estimating noise in image sensors](https://doi.org/10.1049/iet-ipr.2018.5926). IET Image Processing, 14(12), 2737-2745. <https://doi.org/10.1049/iet-ipr.2018.5926>
- Di Stefano, F., Cabrelles, M., García-Asenjo, L., Lerma, J.L., Malinverni, E.S., Baselga, S., Garrigues, P., Pierdicca, R., 2020. [Evaluation of Long-Range Mobile Mapping System \(MMS\) and Close-Range Photogrammetry for Deformation Monitoring. A Case Study of Cortes de Pallás in Valencia \(Spain\)](https://doi.org/10.3390/app10196831). Applied Sciences, 10(19), 6831. <https://doi.org/10.3390/app10196831>
- Barbero-García, I., Pierdicca, R., Paolanti, M., Felicetti, A., Lerma, J. L., 2021. [Combining machine learning and close-range photogrammetry for infant's head 3D measurement: A smartphone-based solution](https://doi.org/10.1016/j.measurement.2021.109686). Measurement, 182, 109686. <https://doi.org/10.1016/j.measurement.2021.109686>
- Carrión-Ruiz, B., Riutort-Mayol, G., Molada-Tebar, A., Lerma, J.L., Villaverde, V., 2021. [Color degradation mapping of rock art paintings using microfading spectrometry](https://doi.org/10.1016/j.culher.2020.10.002). Journal of Cultural Heritage, 47, 100-108. <https://doi.org/10.1016/j.culher.2020.10.002>
- Grieb, J., Barbero-García, I., Lerma, J. L., 2022. [Spherical harmonics to quantify cranial asymmetry in deformational plagiocephaly](https://doi.org/10.1038/s41598-021-04181-z). Scientific Reports, 12, 167. <https://doi.org/10.1038/s41598-021-04181-z>
- Collado, A., Mora-Navarro, G., Heras, V., Lerma, J. L., 2022. [A web-based geoinformation system for heritage management and geovisualisation in Cantón Nabón \(Ecuador\)](https://doi.org/10.3390/ijgi11010004). ISPRS International Journal of Geo-Information, 11(1), 4. <https://doi.org/10.3390/ijgi11010004>

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<http://qifile.webs.upv.es>