

# Curriculum vitae

## Valeria Croce, Ph.D.

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Engineer, Ph.D. in Civil and Environmental Engineering (Universities of Pisa and Florence) and in Sciences des Métiers de l'Ingénieur (Arts et Métiers ParisTech, Aix-en-Provence), Valeria Croce currently works as a post-doctoral research fellow at the University of Pisa. Her research focuses on drawing representation and architectural design, with specific focus on 3D surveying, digital information modeling systems for Cultural Heritage objects, semantic annotations, Artificial Intelligence and H-BIM.

The research addresses the issues of interpreting survey data using more automatic tools based on Artificial Intelligence for the supervised recognition of architectural components and deteriorating conditions, as well as for the characterization of visual and geometric aspects of architectural surfaces; the use of H-BIM platforms and the management of Scan-to-BIM processes; semantic structuring of architectural representations through web-based and collaborative applications; the application of survey tools for pre- and post-disaster investigations, with particular reference to territories at high seismic risk; and the use of photogrammetry even for the documentation of underwater heritage.

The Ph.D. thesis -aimed at investigating a methodological framework for semantic annotation transfer and retrieval on architectural heritage, combining Artificial Intelligence, H-BIM and collaborative reality-based annotation platform- was awarded the VINCI 2019 prix of Université Franco-Italienne (Chapter II - Ph.D. thesis), the first prix for Ph.D. thesis 'Restoration in the era of H-BIM' by the Rotary Club in Rome, and the first prix 'BIM&DIGITAL Awards 2021', organized by CLUSTER BUILD and DIGITAL&BIM. She worked in this framework at the MAP research unit of the French National Center for Scientific Research UMR MAP - Modèles et Simulations pour l'Architecture et le Patrimoine, CNRS/MC, Marseille.

She is currently tenure of co-teaching activities of the Laboratory of Representation of for the CdL in Engineering for Industrial Design, School of Engineering University of Pisa and of Architectural Design for the CdLM in Civil Engineering and Architecture at the University of Pisa. She has previously taught courses in 3D surveying (laser scanning and photogrammetry) for the Master in Building Information Modeling - BIM manager at the University of Pisa, and seminars on her research topics at the University of Padua (Master in BIM), the University of Palermo, the Ecole Nationale Supérieure d'Architecture, Marseille and the UMR MAP - CNRS/MC, Marseille.

Many publications:

- Croce V., Caroti G., Piemonte A., Bevilacqua M.G., 2021. Connecting geometry and semantics via Artificial Intelligence: from 3D classification of heritage data to H-BIM representations. *ISPRS Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLIII-B2-2021, 145-152.
- Croce V., Caroti G., De Luca L., Piemonte A., Véron P. 2020. Semantic annotations on heritage models: 2D/3D approaches and future research challenges. *ISPRS Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLIII-B2-2020: 829-836.
- Croce V., Caroti, G., Piemonte, A. 2021. Propagation of semantic information between orthophoto and 3D replica: a H-BIM system for the north transept of Pisa Cathedral. *Geomatics, Natural Hazards and Risks*, Vol. 12 (1), pp. 2225-2252.
- Croce V., Caroti G., Piemonte A., Bevilacqua M.G.B. 2021. From survey to semantic representation for Cultural Heritage: the 3D modeling of recurring architectural elements. *e-journal ACTA Imeko*, Vol. 10 (1).
- Croce V., Caroti G., De Luca L., Jacquot K., Piemonte A., Véron P. 2021. From the Semantic Point Cloud to Heritage-Building Information Modeling: A Semiautomatic Approach Exploiting Machine Learning. *Remote Sensing*, 13 (3), 461.