

Publications

Mariapaola Riggio

Scientific papers (ISI journals)

- [1] **Mariapaola Riggio**, Jakub Sandak, Steffen Franke, Application of imaging techniques for detection of defects, damage and decay in timber structures on-site, SI: Appraisal of Wooden Members, Construction and Building Materials, 2015 – Elsevier
- [2] Jakub Sandak, Anna Sandak, **Mariapaola Riggio**, Multivariate analysis of multi-sensor data for assessment of timber structures: Principles and applications, SI: Appraisal of Wooden Members, Construction and Building Materials, 2015 – Elsevier
- [3] Anna Sandak, Jakub Sandak, **Mariapaola Riggio**, Estimation of physical and mechanical properties of timber members in service by means of infrared spectroscopy, SI: Appraisal of Wooden Members, Construction and Building Materials, 2015 – Elsevier
- [4] **Mariapaola Riggio**, Jakub Sandak, Anna Sandak, Densified wooden nails for new timber assemblies and restoration works: A pilot research, Construction and Building Materials, 2015 – Elsevier
- [5] Jakub Sandak, **Mariapaola Riggio**, Anna Sandak, What is superb wood surface? Defining user preferences and service life expectations, Forest Products Journal -2015
- [6] Anna Sandak, Jakub Sandak, **Mariapaola Riggio**, Assessment of wood structural members degradation by means of infrared spectroscopy: an overview, Structural Control and Health Monitoring, 2015 - Wiley Online Library
- [7] Jakub Sandak, Anna Sandak, **Mariapaola Riggio**, Characterization and monitoring of surface weathering on exposed timber structures with multi-sensor approach, International Journal of Architectural Heritage - 2015
- [8] Anna Sandak, Anna Rozanska, Jakub Sandak, **Mariapaola Riggio**, Near infrared spectroscopic studies on coatings of 19th century wooden parquets from manor houses in South-Eastern Poland, Journal of Cultural Heritage. doi:10.1016/j.culher.2014.09.009
- [9] **Mariapaola Riggio**, Jakub Sandak, Anna Sandak, Dusan Pauliny, Leszek Babinski, Analysis and prediction of selected mechanical/dynamic properties of wood after short and long-term waterlogging. Construction and Building Materials. Volume 68, 15 October 2014, Pages 444-454
- [10] Anna Sandak, Jakub Sandak, Leszek Babinski, Dusan Pauliny, **Mariapaola Riggio**. Spectral analysis of changes to pine and oak wood natural polymers after short-term waterlogging. Polymer Degradation and Stability 99 (2014) 68-79. 2013.11.018
- [11] **Mariapaola Riggio**, Roberto Tomasi, Maurizio Piazza. Refurbishment of a traditional timber floor with a reversible technique: the importance of the investigation campaign for the design and the control of the intervention. In International Journal of Architectural Heritage 8(1): 74–93. 2014. DOI:10.1080/15583058.2012.670364
- [12] **Mariapaola Riggio**, Ronald W. Anthony, Francesco Augelli, Bohumil Kasal, Thomas Lechner, Wayne Muller, Thomas Tannert. In situ assessment of structural timber using non-destructive techniques. Materials and Structures/Materiaux et Constructions (2014). 47 (5), pp. 749-766
- [13] Thomas Tannert, Ronald W. Anthony, Bohumil Kasal, Michal Kloiber, Maurizio Piazza, **Mariapaola Riggio**, Frank Rinn, Robert Widmann, Nobuyoshi Yamaguchi. In situ assessment of structural timber using semi-destructive techniques. Materials and Structures/Materiaux et Constructions (2014) 47 (5), pp. 767-785
- [14] Ulrike Dackermann, Keith Crews, Bohumil Kasal, Jianchun Li, **Mariapaola Riggio**, Frank Rinn, Thomas Tannert. In situ assessment of structural timber using stress-wave measurements. Materials and Structures/Materiaux et Constructions (2014). 47 (5), pp. 787-803
- [15] Bruno Simões, **Mariapaola Riggio**, Raffaele De Amicis. Modeling morphological features of timber from X-ray tomographic images. International Journal on Interactive Design and Manufacturing (IJIDeM). May 2012, Volume 6, Issue 2, pp 65-73
- [16] Raffaele De Amicis, **Mariapaola Riggio**, Gabrio Girardi, Maurizio Piazza, Morphology-based macro-scale finite-element timber models, Computer-Aided Design, Volume 43, Issue 1, January 2011, Pages 72-87, ISSN:0010-4485 , DOI:10.1016/j.cad.2010.09.003
- [17] Maurizio Piazza, **Mariapaola Riggio**, Typological and Structural Authenticity in Reconstruction: The Case of the Timber Roof of the "Pieve" in Cavalese, International Journal of Architectural Heritage, 2007, pages 60-81, Vol.1, ISSN:1558-3058,DOI:10.1080/15583050601126095,

Scientific papers (indexed, not ISI journals)

- [18] **Mariapaola Riggio**, Maria Adelaide Parisi, Chiara Tardini , Eleftheria Tsakanika, Dina D'ayala, Nicola Ruggieri, Gennaro Tampone, Francesco Augelli, Existing timber structures: proposal for an assessment template, Wiadomosci Konserwatorskie, 2015

- [19] Karel Šobra, Carina Fonseca Ferreira, **Mariapaola Riggio**, Dina D'ayala, Francisco Arriaga, José- Ramón Aira, A new tool for the structural assessment of historic carpentry joints, *Wiadomosci Konserwatorskie*, 2015
- [20] Jakub Sandak, Kazimierz Orłowski, Tomasz Ochrymiuk, Anna Sandak, **Mariapaola Riggio**, An alternative way of determining mechanical properties of wood by measuring cutting forces, *Wiadomosci Konserwatorskie*, 2015
- [21] Jakub Sandak, Nicola Ruggieri, **Mariapaola Riggio**, Marco Fellin, Anna Sandak, Andrea Polastri, Ario Ceccotti, An Italian historic timber framed wall: damage progression through DIC analysis, *Wiadomosci Konserwatorskie*, 2015
- [22] Anna Sandak, Jakub Sandak, **Mariapaola Riggio**, Leszek BabinSki, Magdalena Zborowska, Modelling of waterlogged wood degradation with multisensor aproach, *Wiadomosci Konserwatorskie*, 2015
- [23] **Mariapaola Riggio**, Dusan Pauliny, Jakub Sandak, Anna Sandak (2013) Novel nail-like wood connectors. *Advanced Materials Research Vol. 778 (2013) pp 647-654. doi:10.4028/www.scientific.net/AMR.778.647*
- [24] Anna Sandak, Silvia Ferrari, Jakub Sandak, Ottaviano Allegretti, Nasko Terziev, **Mariapaola Riggio** (2013) Monitoring of wood decay by near infrared spectroscopy. *Advanced Materials Research Vol. 778 (2013) pp 802-809. doi:10.4028/www.scientific.net/AMR.778.802*
- [25] Jakub Sandak, Anna Sandak, **Mariapaola Riggio**, Ilaria Santoni, Dusan Pauliny (2013) The SWORFISH project approach for modeling wood in ancient and prospect timber structures. *Advanced Materials Research Vol. 778 (2013) pp 418-423. doi:10.4028/www.scientific.net/AMR.778.418*
- [26] Jakub Sandak, Anna Sandak, Dusan Pauliny, **Mariapaola Riggio**, Bonfà Sandro, Meglioli Simone (2013) A multi sensor approach for prediction of weathering effects on exposed timber structures. *Advanced Materials Research Vol. 778 (2013) pp 794-80. doi:10.4028/www.scientific.net/AMR.778.794*
- [27] Anna Sandak, **Mariapaola Riggio**, Jakub Sandak (2013) Non destructive characterization of wooden members using near infrared spectroscopy. *Advanced Materials Research Vol. 778 (2013) pp 328-334. doi:10.4028/www.scientific.net/AMR.778.328*
- [28] Thomas Tannert, Jorge M. Branco, **Mariapaola Riggio**, RILEM TC "Reinforcement of timber elements". *Advanced Materials Research Vol. 778 (2013) pp 1041-1048. doi:10.4028/www.scientific.net/AMR.778.1041*
- [29] **Mariapaola Riggio**, Anna Sandak, Jakub Sandak (2012) In-situ assessment of structural timber using selected wave-based NDT methods. *Wiadomosci Konserwatorskie ISBN 978-83-7125-219-8*
- [30] **Mariapaola Riggio**, Federico Prandi, Raffaele De Amicis, Maurizio Piazza. Use of high resolution digital images and NDT imaging techniques for the characterization of timber structural elements. In: *Nondestructive Testing of Materials and Structures*, O. Büyüköztürk et al. (eds.), RILEM Bookseries 6, Pages 365-371. DOI 10.1007/978-94-007-0723-8_53, RILEM 2012
- [31] Maurizio Piazza, **Mariapaola Riggio**, Roberto Tomasi, Ivan Giongo, Comparison of in situ and laboratory testing for the characterization of old timber beams before and after intervention, in: *Periodical of Advanced Materials Research – Structural Analysis of Historic Constructions*, X. Gu, X. Song (Eds.), Trans Tech Publications, *Structural Analysis of Historic Constructions*, 2010, pages 1101-1106, Vol.133- 134, ISBN:13 978-0-87849-239-8, DOI:10.4028/www.scientific.net/AMR.133-134.1101
- [32] Maria Adelaide Parisi, **Mariapaola Riggio**, Chiara Tardini, Maurizio Piazza , Seismic vulnerability assessment of timber structures: a case study, in: *Periodical of Advanced Materials Research – Structural Analysis of Historic Constructions*, X. Gu, X. Song (Eds.), Trans Tech Publications, 2010, pages 741- 746, Vol.133-134, ISBN:13 978-0-87849-239-8, DOI:10.4028/www.scientific.net/AMR.133-134.741,
- [33] Giovanna A. Massari, **Mariapaola Riggio**, Francesco Gadotti , Respecting the diversity". The timber roof of the "Cannons Loggia" in the Thun Castle (Italy) , in: *Periodical of Advanced Materials Research – Structural Analysis of Historic Constructions*, X. Gu, X. Song (Eds.), Trans Tech Publications, 2010, pages 1107-1112, Vol.133-134, ISBN:13 978-0-87849-239-8,DOI:10.4028/www.scientific.net/AMR.133-134.1107,
- [34] Maurizio Piazza, **Mariapaola Riggio**, Roberto Tomasi, Operational stages and criteria in the rehabilitation of timber floors in the Belasi castle (Trentino, Italy), K. Kusnierz (Eds.), *Wiadomosci Konserwatorskie - Conservation News*, 2009, pages 289-299, Vol.26, ISBN:0860-2395, ISSN:0860-2395
- [35] Maurizio Piazza, **Mariapaola Riggio**, Visual strength grading and NDT of timber in traditional structure, *Journal of Building Appraisal*, 2008, pages 267–296, Vol.3, ISSN:1742-8262, DOI:10.1057/jba.2008.4

Book chapters

- [36] **Mariapaola Riggio**, Maurizio Piazza, Hardness test, in: *In Situ Assessment of Structural Timber: Discussion of Classical and Modern Non-Destructive and Semi-Destructive Methods for the Evaluation of Wood Structures*; Series: RILEM State of the Art Reports, Kasal, Bohumil; Tannert, Thomas (Eds.), Springer, 2011, Vol.7, Pages 85-95, ISBN:978-94-007-0559-3
- [37] **Mariapaola Riggio**, Maurizio Piazza, Analisi in situ di elementi lignei di strutture storiche: metodologie, normative e applicazioni di tecniche non distruttive, in: *Consolidamento delle strutture in legno*, M. Piazza (Ed.), Evelius, 2009, pages 9-24, ISBN:9788886977647

Curatorship

- [38] José S. Machado, **Mariapaola Riggio**, Dina D'Ayala, Special Issue: Appraisal of Wooden Members. Construction and Building Materials, 2015
- [39] Dina D'Ayala, **Mariapaola Riggio**, Special Issue: Assessment of historical timber structures–Selected papers from SHATIS13, International Journal of Architectural Heritage, 2015
- [40] Paolo Bellintani, Michela Cunaccia, **Mariapaola Riggio** (Editors). Conoscere e Ricostruire. Edifici in legno: dalle palafitte preistoriche all'età contemporanea. Seminar, 17-18 October 2014. Teatro di Bleggio Superiore (TN), Italia.
- [41] Maurizio Piazza, **Mariapaola Riggio** (Editors). SHATIS13. Proceeding of the 2nd international Conference on Structural Health Assessment of Timber Structures. In Advanced Materials Research. 2013. TransTech publ. ISBN-13: 978-3-03785-812-7

Participation in Conferences

- [42] Jakub Sandak , Anna Sandak, **Mariapaola Riggio**, Gianni Picchi, James Burger, Measuring wood with hyperspectral imaging. 5th IASIM conference in spectral imaging, Rome (Italy), December 3rd–5th 2014.
- [43] Dina D'Ayala, Jorge Branco, **Mariapaola Riggio**, Annette Harte, Jochen Kurz, Thierry Descamps, Assessment, Reinforcement and Monitoring of Timber Structures: FPS Cost Action FP1101, World Conference on Timber Engineering, Proceedings of the 9th International Conference SAHC 2014 (Structural Analysis of Historical Constructions), Mexico City, 14-17 October 2014. ISBN 04-2014-102011495500-102
- [44] Dina D'Ayala, Jorge Branco, **Mariapaola Riggio**, Annette Harte, Jochen Kurz, Thierry Descamps, Assessment, Reinforcement and Monitoring of Timber Structures: FPS Cost Action FP1101, World Conference on Timber Engineering, WCTE2014, Quebec City, Canada, August 10-14 2014.
- [45] **Mariapaola Riggio**, Nicola Macchioni. Assessment of historical timber structures: interaction of COST ACTION FP1101 with the CEN TC 346. Proceedings of the PROHITECH 2014 - 2nd International Conference On Protection Of Historical Constructions, 7-9 May 2014, Antalya, Turkey.
- [46] Dina D'Ayala, Jorge Branco, **Mariapaola Riggio**, Annette Harte, Jochen Kurz, Thierry Descamps, Assessment, Reinforcement and Monitoring of Timber Structures: FPS Cost Action FP1101. Proceedings of the PROHITECH 2014 - 2nd International Conference On Protection Of Historical Constructions, 7-9 May 2014, Antalya, Turkey.
- [47] **Mariapaola Riggio**, Jakub Sandak, Anna Sandak, Ilaria Santoni, Leszek Babinski (2013). Degradation of wooden surfaces in historical buildings: integrated sensing and modeling techniques for monitoring and conservation. Built Heritage 2013. Monitoring Conservation Management, Milano, Italy, 18-20 November 2013. ISBN 978-88-908961-0-1
- [48] **Mariapaola Riggio** (2013). COST ACTION FP1101 “ Assessment, Reinforcement and Monitoring of Timber structures”: The workshop on the “Vulnerability Assessment of Timber Framed Structures”. Historic Earthquake-Resistant Timber Frames in the Mediterranean Area (H.Ea.R.T.2013), Rende, Italy 4-5 November 2013
- [49] Sandak Jakub, Sandak Anna, Pauliny Dusan, Bonfa Sandro, Meglioli Simone, **Mariapaola Riggio**, Ilaria Santoni (2013) FT-NIR evaluation of chemical changes to wood surfaces exposed to natural and artificial weathering. 16th International Conference on Near Infrared Spectroscopy (ICNIRS 2013) La Grande-Motte, France, 2 - 7 June 2013
- [50] **Mariapaola Riggio**, Federico Prandi, Raffaele de Amicis, Maurizio Piazza. Geometrical characterization of timber structural elements in the roof of S. Lorenzo church in Tenno (TN, Italy) using close range photogrammetry. CULTURAL HERITAGE Istanbul 2011. 5th International Congress "Science and Technology for the Safeguard of Cultural Heritage in the Mediterranean Basin". Istanbul, Turkey, 22-25 November 2011.
- [51] **Mariapaola Riggio**, Jakub Sandak, Anna Sandak, Maurizio Piazza. NDT imaging techniques for the characterization of traditional timber structures: a case study. CULTURAL HERITAGE Istanbul 2011. 5th International Congress "Science and Technology for the Safeguard of Cultural Heritage in the Mediterranean Basin". Istanbul, Turkey, 22-25 November 2011.
- [52] Bruno Simões, **Mariapaola Riggio**, Raffaele De Amicis. Application of image analysis for detection of wood features from NDT imaging data. Proceedings of the 17th International Nondestructive Testing and Evaluation of Wood Symposium, Sopron, Hungary, 14-16 September, 2011.
- [53] **Mariapaola Riggio**, Maurizio Piazza. Stress waves tomography for the analysis of structural timber: limits, applications, possible combinations with other analysis techniques. Proceedings of the 17th International Nondestructive Testing and Evaluation of Wood Symposium, Sopron, Hungary, 14-16 September, 2011.
- [54] **Mariapaola Riggio**, Maurizio Piazza. Acoustic tomography of timber elements. International Conference on Structural Health Assessment of Structural Timber, 16-17 June 2011, Lisbon, Portugal.
- [55] **Mariapaola Riggio**, Federico Prandi, Raffaele De Amicis, Maurizio Piazza. Close Range Photogrammetry and NDT imaging techniques for the characterization of timber structural elements, International Conference on Structural Health Assessment of Structural Timber, 16-17 June 2011, Lisbon, Portugal.
- [56] **Mariapaola Riggio**, Massimo Santini, Raffaele De Amicis, Maria Laura Torrente , Use of X-ray tomography and CAD techniques for "morphology-based" wood elements models. Proceedings of IDMEE-Virtual Concept 2010, Bordeaux France, October 20-22, 2010. In: Research in Interactive Design, X. Fischer, J.O. Nadeau (Eds), Springer, 2010, Vol.3, ISBN:978-2-8178-0168-1
- [57] Albino Angeli, Maurizio Piazza, **Mariapaola Riggio**, Roberto Tomasi. Refurbishment of traditional timber floors by means of wood-wood composite structures assembled with inclined screw connectors, A. Ceccotti and J.W van de

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- [58] **Mariapaola Riggio**, Maurizio Piazza, Andrea Polastri, Dynamic testing of wood utility poles, M.C. Forde (Eds.), Structural Faults + Repair-2010, Edimburgo, 15-17/06/2010, 2010, Vol.1, ISBN:0-947644-66-0
- [59] **Mariapaola Riggio**, Maurizio Piazza, Andrea Polastri, Structural Assessment of Wood Utility Poles: A Research in the Telephonic Network in Italy, H. Zhang, X. Wang (Eds.), 16th International Nondestructive Testing and Evaluation of Wood Symposium, Beijing, China, 12-14/10/2009, 2009, pages 97-104
- [60] Maurizio Piazza, **Mariapaola Riggio**, NDT methods for the assessment of structural timber: report on the researches carried out at the University of Trento (Italy), RILEM, On Site Assessment of Concrete, Masonry and Timber SaCoMaTis 2008, Varenna (LC), Italy, 1-2/09/2008 2008, pages 1039-1047, Vol.2, ISBN:9782351580639
- [61] Maurizio Piazza, **Mariapaola Riggio**, Limits of visual strength grading: old timber roof beams of the "Ai caduti dell'Adamello" refuge, M.C. Forde, Structural Faults + Repair-2006, Edimburgo, UK, 13-15/06/2006, 2006, ISBN:0-947644-59-8
- [62] Maurizio Piazza, **Mariapaola Riggio**, Numerical analysis by F.E.M. for the assessment and the strengthening of the masonry vaults of the "Pieve" in Cavalese, MacMillan, VI International Conference on Structural Analysis of Historical Constructions, New Delhi, India, 6-8/11/2006, 2006, pages 947-955, ISBN:13: 978-1403-93155-9
- [63] Maurizio Piazza, **Mariapaola Riggio**, The reconstruction of the timber roof of the "Pieve" in Cavalese, MacMillan, VI International Conference on Structural Analysis of Historical Constructions, New Delhi, India, 6-8/11/2006, 2006, ISBN:9781403931559
- [64] Maurizio Piazza, **Mariapaola Riggio**, Giovanni Brentari, Strengthening and control methods for old timber trusses: the queen-post truss of the Trento Theatre, Balkema, IV International Conference on Structural Analysis of Historical Constructions, Padova, Italia, 10-13/11/2004, 2004, pages 957-965, ISBN:0415363799
- [65] **Mariapaola Riggio**, Raffaele De Amicis, Maurizio Piazza, Virtual reality for restoration of ancient buildings, Architectura 3000, III International Conference, 30.6/3.7 2004, Barcelona, Spain.

Reports

- [66] Jakub Sandak, Anna Sandak, Dusan Pauliny, **Mariapaola Riggio**, Ilaria Santoni (2013) About some chemical changes to wood due to densification. COST Action 0904 Evaluation, processing and predicting of THM treated wood behavior by experimental and numerical methods, Iasi, Romania April 09-11, 2013
- [67] Jakub Sandak, Anna Sandak, Dusan Pauliny, **Mariapaola Riggio**, Ilaria Santoni, Sandro Bonfa, Simone Meglioli (2013) Multivariate analysis of the coated wood surfaces for service life prediction COST Action 1106 Process and Service life modeling, Ghent, Belgium April 17 – 19, 2013
- [68] Jakub Sandak, Anna Sandak, Dusan Pauliny, **Mariapaola Riggio**, Ilaria Santoni (2013) About some chemical changes to wood due to densification. COST Action 0904 Evaluation, processing and predicting of THM treated wood behavior by experimental and numerical methods April 09-11, 2013, Iasi, Romania
- [69] **Mariapaola Riggio**, Maurizio Piazza (2013). Valutazioni preventive per la definizione delle ipotesi di intervento su strutture lignee esistenti basate sull'uso di tecniche diagnostiche non distruttive. Report della ricerca UNITN-01. Progetto esecutivo DPC-RELUIS 2010-2013- AT1–Strumenti per la valutazione e la gestione del rischio del patrimonio costruito. Linea1–Nuovi aspetti nella valutazione delle strutture esistenti e degli interventi di adeguamento e valutazione del rischio sismico del patrimonio costruito a scala regionale. Task1–Valutazione della vulnerabilità degli edifici in muratura, centri storici e beni culturali.
- [70] Jakub Sandak, Dusan Pauliny, Anna Sandak, **Mariapaola Riggio**, Ilaria Santoni, (2013) Modeling Effect of Wood Anatomy on the Surface Roughness after Wood Machining. Presented on 21th IWMS Tsukuba, Japan, 4-7 August 2013
- [71] Jakub Sandak, Anna Sandak, **Mariapaola Riggio**, Ilaria Santoni (2013) Superb wood surface finishing – SWORFISH project approach. Joint focus workshop of COST Action FP1006 & FP0904 Characterization of modified wood in relation to wood bonding and coating performance, Rogla, SLOVENIA 16 - 18 October, 2013

Short papers

- [72] **Mariapaola Riggio**, Jakub Sandak, Anna Sandak, Diagnostica e monitoraggio di strutture lignee storiche. In: Conoscere e ricostruire. Edifici in legno: dalle palafitte preistoriche all'età contemporanea.
- [73] Dao Minh-Son, **Mariapaola Riggio**, Raffaele De Amicis, 3D Wood objects modelled using their grains, Computer Graphik TOPICS, Reports of the INI-GraphicsNet, 2006, pagine 26-28, Vol.18, ISSN:0936-2700,
- [74] **Mariapaola Riggio**, Raffaele De Amicis, Giuliana Ucelli, Giuseppe Conti, DENTROTRENTO- Real and Virtual experiences of the Trentino culture, Computer Graphik TOPICS, Reports of the INI-GraphicsNet, 2003, pagine 20-21, Vol.15, ISSN:0936-2770

