

Luca Santoro

Curriculum Vitae

Department of Mechanical and Aerospace Engineering
Politecnico di Torino
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Nec spe nec metu

Education

- 2021–2024 **PhD Machine Design**, Politecnico di Torino.
Thesis: Active thermography as non-destructive evaluation for welded joint
Presented over 15 published papers, over 10 conferences
- 2019–2021 **MEng Mechanical Engineering**, Politecnico di Torino.
Final Score: 110/110
- 2016–2019 **BSc Mechanical Engineering**, Politecnico di Torino.
Final Score: 102/110

Research Experience

- May 2024 – Present **Member – Working Group NDT in Additive Manufacturing**, AP&D ETS – Italian Society for NDT.
- April 2023 – **Guest Scientist**, Technical University of Munich.
- July 2023 *Research Topic:*
- Additive manufacturing on stainless steel for civil applications.
 - Fatigue behavior of AM materials.
 - Thermography for fast evaluation of fatigue limit.

Experience

- July 2024 – Present **Nominated TT Examiner (ISO 9712 level 1, 2, and 3)**, ADES Group.
- Conducting thermographic testing examinations in compliance with ISO 9712 standards for levels 1, 2, and 3.
 - Evaluating and certifying the competence of NDT personnel.
 - Preparing and reviewing examination documentation.
- March 2021 – **Intern**, ADES Group.
- June 2021
- Developed technical procedures for residual stress detection.
 - Conducted metallographic analysis and fracture mechanics studies.

Skills

Technical Python, Computer Vision, Finite Element Analysis (FEA)
Lab Mechanical Testing, Metallurgy, Robotics

Certificates

- July 2024 **Qualified and Certified TT Level 3 ISO 9712**, ADES Group.
- January 2022 **CSWIP 3.0**, The Welding Institute.
- October 2019 **Licensed and Registered Engineer**, Order of Engineers of the Province of Syracuse, Italy.

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Patents

- 2023 **Brevetto nazionale**, *Metodologia di identificazione delle tensioni residue su materiali e componenti mediante tecniche di termografia attiva*.
- 2024 **Brevetto nazionale**, *Metodologia Per Il Controllo Non Distruttivo Di Giunti Saldati Tramite Termografia Attiva*.

Teaching Assistantship

Spring, 2024 : **Challenge TOSA**, Politecnico di Torino.


Publications

Journal Articles

- 2024 Raffaella Sesana and Luca Santoro. Proposal for K_f effective notch factor estimation for life assessment of welded joint based on geometric parameters. *Engineering Failure Analysis*, volume 157, page 107944. Pergamon, March 2024.
- 2024 Luca Santoro, Raffaella Sesana, Johannes Diller, Christina Radlbeck, and Martin Mensinger. Dissipative and thermal aspects in cyclic loading of additive manufactured AISI 316L. *Engineering Failure Analysis*, volume 163, page 108446. Pergamon, September 2024.
- 2024 Luca Santoro, Valentino Razza, and Manuela De Maddis. Nugget and corona bond size measurement through active thermography and transfer learning model. *International Journal of Advanced Manufacturing Technology*, volume 133, pages 5883–5896. Springer Science and Business Media Deutschland GmbH, August 2024.
- 2024 Luca Santoro, Valentino Razza, and Manuela De Maddis. Frequency-based analysis of active laser thermography for spot weld quality assessment. *International Journal of Advanced Manufacturing Technology*, volume 130, pages 3017–3029, 2024.
- 2024 Luca Santoro, Michele Quercio, Aldo Canova, and Raffaella Sesana. Measuring thermal and electrical performances of additively manufactured magnetic shielding material: An active thermography approach. *Nondestructive Testing and Evaluation*, pages 1–24, January 2024.
- 2024 Vittoria Borghese, Luca Santoro, Silvia Santini, and Raffaella Sesana. Correlation between thermal and density properties of chestnuts: Preliminary results of experimental non-destructive testing. *Archives of Civil and Mechanical Engineering*, volume 24, pages 1–15. Springer, May 2024.
- 2023 Raffaella Sesana, Luca Santoro, Francesca Curà, Rosario Molica Nardo, and Piergiorgio Pagano. Assessing thermal properties of multipass weld beads using active thermography: Microstructural variations and anisotropy analysis. *International Journal of Advanced Manufacturing Technology*, volume 128, pages 2525–2536, 2023.
- 2023 Luca Santoro, Raffaella Sesana, Rosario Molica Nardo, and Francesca Curà. Infrared in-line monitoring of flaws in steel welded joints: A preliminary approach with SMAW and GMAW processes. *International Journal of Advanced Manufacturing Technology*, volume 128, pages 2655–2670, 2023.

In Conference Proceedings

- 2023 Luca Santoro and Raffaella Sesana. Termografia attiva e passiva per la caratterizzazione del danneggiamento a fatica dell'acciaio 25CrMo4. In *AIAS2023*. AIAS, 2023.
- 2023 Luca Santoro and Raffaella Sesana. Caratterizzazione non distruttiva dello stato metallurgico tramite analisi termica basata sulla frequenza. In *AIAS2023*. AIAS, 2023.
- 2023 Luca Santoro and Raffaella Sesana. Approccio termografico allo studio delle proprietà fisiche di manufatti storici in legno: Risultati preliminari. In *AIAS2023*. AIAS, 2023.



- 2023 Luca Santoro, Vittoria Borghese, Silvia Santini, Raffaella Sesana, Francesca Maria Cura, and Luca Corsaro. Density estimation of historical wooden elements through means of thermographic correlation approach. In *Proceedings Book of ART'23*, pages 1–6, Brescia, 2023. AIPND.
- 2023 L Santoro, R Sesana, F M Cura, and L Corsaro. In line defect detection in steel welding process by means of thermography. In *PROCEEDINGS ICEM20 EXPERIMENTAL MECHANICS IN ENGINEERING AND BIOMECHANICS*, pages 1059–1068, Oporto, 2023. FEUP.
- 2023 Manuela De Maddis, Valentino Razza, and Luca Santoro. Metodo per il controllo non distruttivo di giunti saldati, mediante termografia attiva, 2023.
- 2023 F M Cura, L Santoro, R Sesana, and L Corsaro. Assessments on material thickness and coating in laser spot active thermography. In *PROCEEDINGS ICEM20 EXPERIMENTAL MECHANICS IN ENGINEERING AND BIOMECHANICS*, pages 1051–1058, Oporto, 2023. FEUP.
- 2023 Luca Corsaro, Francesca Maria Cura, Luca Santoro, and Raffaella Sesana. Metodologia di identificazione delle tensioni residue su materiali e componenti mediante tecniche di termografia attiva, 2023.
- 2022 Raffaella Sesana, Cura Francesca, Luca Corsaro, Luca Santoro, and Marie Marguerite Dugand. La termografia attiva applicata allo studio della corrosione nei materiali metallici: un caso studio. In *PnD VERONA 2022 Conferenza Nazionale sulle Prove non Distruttive Monitoraggio Diagnostica*, volume 1, pages 1–8, Brescia, 2022. AIPND.
- 2022 Luca Santoro and Raffaella Sesana. Confronto tra termografia attiva e passiva nello studio del danneggiamento per l'acciaio c40. In *AIAS2022*. AIAS, 2022.
- 2022 Cura Francesca, Raffaella Sesana, Luca Corsaro, and Luca Santoro. La termografia attiva applicata allo studio della fatica nei materiali metallici: un caso studio. In *PnD VERONA 2022 Conferenza Nazionale sulle Prove non Distruttive Monitoraggio Diagnostica*, pages 1–8. AIPND, 2022.

