

Scientific and professional curriculum

1. Personal Information

Name: Wael

Surname: Alahmad

Date of birth: 05/01/1997

Place of birth: Latakia-Syria

Nationality: Syrian

E-mail: wael.alahmad2@unibo.it

Address: Via Sant'Isaia 70, 40123, Bologna (Italy)

Telephone: (+39) 3494600576

2. Education and Training

PhD in architecture and design culture

University of Bologna [01/11/2024 – current]

A PhD student at the university of bologna, research title: Assessment of historic masonry structures using remote sensing data and transfer learning.

Scientific disciplinary sector: Structural Mechanics ICAR/08

Master Degree in Civil Engineering (class LM-23)

University of Bologna [18/09/2022 – 08/10/2024]

Master's degree in civil engineering, graduation thesis "Multi-Temporal SAR Interferometry for Structural Assessment of Bridges: flood event of PO river 2019" (Supervisor: Prof. Alessandro Marzani, co-supervisor: Prof. Said Quqa). (110/110 with honor)

Bachelor Degree of Civil Engineering

Tishreen University [20/09/2014 – 15/12/2020]

Bachelor's degree in Structural Civil Engineering, graduation thesis "Design and implementation of earthquake-resistant reinforced concrete tall buildings" (73.03/100)

3. Interests and Research Themes

Methodologies for Synthetic Aperture Radar Interferometry

During the thesis, I have been studying methodologies for using Synthetic Aperture Radar (SAR) interferometry to extract valuable information about the deformation and subsidence of ground and of civil structures.

Effects of environmental factors on civil structures

I have also been focusing on investigating the effects that environmental drivers, such as temperature, humidity, and wind, may have on civil structures. This aspect is crucial to discern unexpected variations in the structural behavior due to damage and those due to environmental variations.

Failure detection using only the displacement over time pattern

My research interests include the study of failure mechanisms of bridges and historic masonry buildings. I have been studying monitoring techniques to identify early signs of structural anomalies based on remote sensing data.

Machine & Deep Learning for SHM

Supervised/unsupervised pipelines (e.g., LSTM/CNN/transformers) for anomaly and damage detection from displacement time-series and multisource monitoring; fusion of InSAR with environmental covariates.

Transfer Learning & Domain Adaptation

Population-based SHM across related structures; cross-bridge knowledge transfer to mitigate data sparsity and distribution shift.

4. Teaching Activities

Tutoring Activities

Department of Civil, Chemical, Environmental, and Materials Engineering, University of Bologna.

Advanced Structural Mechanics

Period: 17/09/2024 – Present

Selected through a competitive process to serve as a tutor for the course Advanced Structural Mechanics, taught by Prof. Alesandro Marzani and Prof. Antonio Palermo as part of the master's degree Program in Civil Engineering for the 2024/2025 academic year. The assigned module has a total duration of 30 hours.

Advanced Structural Mechanics M

Period: 17/09/2024 – Present

Selected through a competitive process to serve as a tutor for the course Advanced Structural Mechanics M taught by Prof. Alesandro Marzani and Prof. Antonio Palermo as part of the master's degree Program in Engineering of Building Processes and Systems for the 2024/2025 academic year. The assigned module has a total duration of 30 hours.

5. Conference Presentations

5.1 ARTISTE 2025 - International Conference on Artificial Intelligence in Structural Engineering
(Turin, Italy, 14–17 Sep 2025)

Project titled: Satellite-informed population-based structural health monitoring of masonry arcades

5.2 MuRiCo 2025 - Mechanics of Masonry Structures Strengthened with Composite Materials
(Bologna, Italy, 25–27 Jun 2025)

Project titled: Simplified Parametric Structural Model for Masonry Porticoes and Bridges

Conference paper & presentation (LNCE vol. 753, Springer).

5.3 AID Monuments 2024 Conference on Assessment and Conservation of Architectural Heritage (Perugia, Italy, Dates 21 to 24 May 2024)

Project titled: Anomaly detection in historical masonry structures using transfer learning

6. Publications

Peer-reviewed conference papers

Alahmad, Wael; Quqa, Said; Ugolini, Andrea; Gentilini, Cristina. 2025.

Title: Simplified Parametric Structural Model for Masonry Porticoes and Bridges.

Conference: Mechanics of Masonry Structures Strengthened with Composite Materials. MuRiCo 2025.
Lecture Notes in Civil Engineering, volume 753. Springer, Cham. pages 475 to 484. DOI 10.1007/978-3-032-05032-8_36. First online 18 October 2025.

7. Participation in Seminar

Ground Stability Monitoring and Innovations

Date: 08/11/2024

Seminar conducted by Prof. Andrew Guzzomi and the associated research group from the University of Western Australia . The seminar addressed critical issues related to ground stability in Australia, with a particular focus on the geotechnical challenges posed by diverse environmental and geological conditions. Advanced monitoring technologies were introduced, including innovative methodologies for detecting and analyzing land movements. The seminar emphasized both theoretical approaches and practical applications, showcasing state-of-the-art techniques for improving land stability monitoring and management.

Strain Gauges: principles and applications

Date: 19-20 /11 /2024

Seminar conducted by Mr. Roberto Bianchi, focusing on the fundamentals and advanced applications of strain gauges in materials mechanics. Key topics included the principles of strain gauge functionality, the Wheatstone bridge configuration, and sensitivity adjustments. The session incorporated hands-on practical work, where participants engaged in the installation of strain gauges and conducted functionality tests to ensure proper operation. This involved preparing surfaces, configuring Wheatstone bridges, and verifying measurement accuracy under controlled conditions.

Architectural Restoration for Quality Projects

Date: 22/11/2024

Seminar highlighting the fundamental aspects of the new guidelines published by SIRA (Italian Society for Architectural Restoration) in 2023. The event featured prominent experts from across the country, including contributions from Professor Andrea Ugolini from the University of Bologna, who presented innovative real-world examples from recent restoration projects. Discussions emphasized the principles outlined in SIRA's "Guidelines for Quality in Architectural Restoration," developed with input from the scientific and professional community during the III National Conference in Naples.

Joint Learning

Date: 2-4/12/2024

Seminar organized in collaboration with the Joint PhD Program "Service Design for Public Sector," coordinated by UNI Sapienza and led by Prof. Valentina Gianfrate. This seminar focused on applying design principles to complex contexts and included external guest speakers, a hands-on workshop titled "Extreme & Space Design," and peer-to-peer dialogues among doctoral candidates. The program also featured study visits to significant sites in Bologna, such as Serra Madre and Co-Location Centre C&C.

Historical City and Urban Aesthetics: Conceptual Frameworks and Public Spaces

Date: 12-14/12/2024

Organized by Prof. Andrea Borsari in collaboration with Francesco Di Maio and Claudia Nigrelli (Architectural Humanities, Department of Architecture - University of Bologna), this international seminar explored the interplay between historical cities, urban aesthetics, and public spaces.

Key sessions included: thinking the Contemporary City, practices, cartographies, and conflicts in historical cities, the right to the city and the aesthetics of public spaces, mediativity of public spaces and affective city, genealogies and law in public spaces, aesthetical and social transformations in the urban sensorium, and techno-aesthetical perspectives on the city.

8. Participation in Courses

IT Fundamentals for Monitoring Applications

Organized by Federico Montori, Matteo Poggi, and Alessandro Lanza, this course covered IoT architectures, smart objects, wireless communication, and data elaboration. The second semester focused on data denoising techniques, while the final part introduced deep learning for structural monitoring. Through theoretical and practical sessions, we gained hands-on experience with modern monitoring applications. I successfully passed the final exam

Applied Machine Learning

Organized by Prof. Daniele Bonacorsi, with a module by Dr. Luca Clissa, this course addresses core and advanced topics in machine and deep learning. The program includes decision trees, ensemble methods, support vector machines, the fundamentals of neural networks (perceptrons, tensors and tensor operations), convolutional and recurrent architectures (including LSTM and GRU), autoencoders, transformers and large language models, as well as interpretability and MLOps. Teaching combines lectures with hands-on notebook exercises using standard ML and DL frameworks.

9. Professional skills

Assistant civil engineer

Eng. Abdul Lattif Sauod office, Latakia, Syria [20/01/2020-15/03/2021]

During my internship in the construction sector, I played a role in the design and analysis of multi-story reinforced concrete structures. This immersive experience allowed me to closely observe the implementation phase, providing integration of theoretical learning with hands-on application. Additionally, I excelled in writing comprehensive reports, observing budget constraints, and consistently meeting tight deadlines. Collaborating closely with team members, I ensured effective coordination and contributed to the successful completion of projects. Moreover, I was responsible for monitoring daily construction activities, ensuring adherence to project plans and quality standards

Full time civil engineer

Eng. Bassam Alsaid Ahmad [21/03/2021-10/06/2022]

As a specialist in safety assessments of existing buildings, I evaluated the structural integrity of load-bearing elements, considering factors such as material aging and damage. One significant project involved a detailed analysis of a four-story reinforced concrete structure to ascertain its capability to accommodate an additional story. This undertaking necessitated a comprehensive examination of the structural condition and the implications of the proposed expansion, including the task of designing and incorporating the new story into the existing building framework.

Engineering Competencies

Ability to design in the field of structural engineering, with reference to current regulations, and considering seismic actions. Particular areas of design and analysis:

- Building and civil structures in reinforced concrete and steel;
- Bridges with prefabricated beams in prestressed reinforced concrete
- Restoration and/or consolidation interventions aimed at improving structural conditions.
- Ability to create and read algorithms with high-level languages (MATLAB).

Computer skills

Excellent computer skills, acquired through university education, with reference to:

- Finite element modeling software (SAP2000, ETABS, PLAXIS 2D)
- MATLAB language
- Two-dimensional and three-dimensional modeling software (AutoCAD, Revit)
- Office suite tools (Microsoft Office, OpenOffice)

10. Other Competencies

I acquired excellent communication skills through active participation in workshops and delivering presentations during university. I further enhanced these skills in practical work settings, effectively liaising with colleagues and stakeholders. I demonstrated problem-solving abilities, both academically and in real-world contexts, while analyzing structural integrity and proposing solutions. I exhibited strong organizational and leadership qualities through diverse academic and extracurricular engagements, showcasing a proactive approach.

Language skills

English Language

I am fluent in both written and oral communication. I understand the main ideas of complex texts on both specific and abstract topics, including technical discussions in my field of specialization. I am able to interact with a degree of fluency and spontaneity that makes natural interaction with native speakers possible without strain for either party. I can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topic, providing the pros and cons of various options.

Italian Language (level B2)

I can engage in conversation with native speakers with a reasonable degree of fluency and spontaneity, making regular interaction quite manageable. I can produce clear, detailed text on a variety of topics and describe the advantages and disadvantages of different options.

Volunteering activities**Bologna, Italy [20/02/2023-current]**

Working alongside the neighborhood association, I have played an active role in two significant endeavors. Our main focus has been on coordinating campaigns to distribute food and essential items, providing vital assistance to those facing hardship within our community. Furthermore, I participated in supporting new immigrants by arranging language lessons aimed at achieving A1 proficiency, which serves as a foundational step towards their integration. Additionally, I offer assistance in navigating documentation processes, ensuring a smooth transition for newcomers as they settle into our community.

Latakia, Syria [04/2017 - 05-2019]

At the S.E.T association, I actively participated in facilitating dynamic conferences tailored to assist new university students in selecting their academic faculties, ensuring they made well-informed decisions. Additionally, I contributed to coordinating educational excursions to construction sites, providing civil engineering students with invaluable real-world insights and hands-on experience in their field of study.

Date: 24 October 2024