

Fernando Ávila

Civil Engineer, PhD

Research and Teaching Experience

- Dec. 2023 – Present **Researcher**
University of Perugia (Italy). Department of Civil and Environmental Engineering. Research project: Advanced Simulation and Monitoring of Ultimate Behavior in Civil Engineering Structures.
- Oct. 2023 – Present **Assistant Lecturer**
University of Granada (Spain). Computational Mechanics I: Finite Element Method, Master's Degree in Structural Engineering.
- Oct. 2019 – Dec. 2023 **Researcher**
University of Granada (Spain). Department of Structural Mechanics and Hydraulic Engineering. Main research lines: historic structures, traditional building materials, materials characterization, seismic vulnerability.
- Oct. 2019 – Ago. 2021 **Lecturer**
University of Granada (Spain). Department of Structural Mechanics and Hydraulic Engineering. Structural Analysis, Bachelor's Degree in Civil Engineering.

Other Professional Experience

- Jan. 2022 – Dec. 2023 **Structural Engineer**
Carlos Fernández Casado, S.L. Madrid (Spain)
- Sep. 2021 – Jan. 2022 **Structural Engineer**
FHECOR Ingenieros Consultores. Madrid (Spain)
- Sep. 2018 – Sep. 2019 **Site Engineer**
Dragados, SA. Málaga (Spain)

Education

- 2019 – 2023 **PhD in Civil Engineering**
University of Granada (Spain). Graduated *Summa Cum Laude*
- 2019 – 2023 **PhD in Civil and Environmental Engineering**
University of Florence (Italy). Graduated *Summa Cum Laude*
- 2016 – 2018 **MSc in Civil Engineering**
University of Granada (Spain). Graduated with First Class Honors
Nine-months Erasmus stay in Polytechnic University of Turin (Italy)
- 2016 – 2018 **MSc in Structural Engineering**
University of Granada (Spain). Graduated with First Class Honors
- 2012 – 2016 **BS in Civil Engineering**
University of Granada (Spain). Graduated with First Class Honors

Languages

- Spanish** Native speaker
- English** C1 – Cambridge Certificate in Advanced English
- Italian** C2 – PLIDA C2 Certificate

Research stays

- Jan. 2022 – Jul. 2022 **University of Florence (Italy)**
Dep. of Civil and Environmental Engineering. Predoctoral stay (6 months)
- Apr. 2021 – Jul. 2021 **University of Florence (Italy)**
Dep. of Civil and Environmental Engineering. Predoctoral stay (3 months)

Awards and scholarships

Awards **National Award for Excellence in Academic Performance**

Spain's most prestigious academic award, for students with the best academic performance in their BSc. Awarded by the Spanish Ministry of Universities. 2020.

Special End-of-Degree Award for Undergraduate Students

Award for the student with the best marks in his course. University of Granada. 2016.

Academic Excellence Award

Awarded by the University of Granada and Caja Rural de Granada. 2016.

Scholarships **FPU scholarship**

Spain's most prestigious and competitive doctoral fellowship. Ref. FPU18/03607. 2018.

Publications

Journal Articles

Ávila, F., Puertas, E., Torrús, C. & Gallego, R. (2024). Influence of crack propagation on the seismic behavior of historic rammed earth buildings: the Tower of Muhammad in the Alhambra (Spain). *Engineering Structures*, 34, 117365. <https://doi.org/10.1016/j.engstruct.2023.117365>

Ávila, F., Fagone, M., Puertas, E., & Gallego, R., & Ranocchiali, G. (2023). Experimental and Numerical Evaluation of the Compressive and Shear Behavior of Unstabilized Rammed Earth. *Materials and Structures*, 56, 118. <https://doi.org/10.1617/s11527-023-02206-9>

Martínez-Soto, F., Ávila, F., Puertas, E., & Gallego, R. (2023). FFRC and SASW nondestructive evaluation of concrete strength from early ages. *Journal of Building Engineering*, 76, 107093. <https://doi.org/10.1016/j.jobbe.2023.107093>

Ávila, F., Puertas, E., & Gallego, R. (2022). Mechanical characterization of lime-stabilized rammed earth: Lime content and strength development. *Construction and Building Materials*, 350, 128871. <https://doi.org/10.1016/j.conbuildmat.2022.128871>

Ávila, F., Puertas, E., & Gallego, R. (2022). Characterization of the mechanical and physical properties of stabilized rammed earth: A review. *Construction and Building Materials*, 325, 126693. <https://doi.org/10.1016/j.conbuildmat.2022.126693>

Ávila, F., Puertas, E., Azañón, J. M., & Gallego, R. (2022). Free-free resonance method for the mechanical characterization of carbonate rocks used as building stones. *Materiales de Construcción*, 72(345), e276. <https://doi.org/10.3989/mc.2022.03421>

Martínez, J., Ávila, F., Puertas, E., Burgos, A., & Gallego, R. (2022). Historical and architectural study for the numerical modeling of heritage buildings: the Tower of Comares of the Alhambra (Granada, Spain). *Informes de La Construcción*, 74(565), e429. <https://doi.org/10.3989/ic.86683>

Ávila, F., Puertas, E., & Gallego, R. (2021). Characterization of the mechanical and physical properties of unstabilized rammed earth: A review. *Construction and Building Materials*, 270, 121435. <https://doi.org/10.1016/j.conbuildmat.2020.121435>

Martínez-Soto, F., Ávila, F., Puertas, E., & Gallego, R. (2021). Spectral analysis of surface waves for non-destructive evaluation of historic masonry buildings. *Journal of Cultural Heritage*, 52, 31–37. <https://doi.org/10.1016/j.culher.2021.09.002>

Ávila, F., Puertas, E., & Gallego, R. (2021). Experimental evaluation of the optimum lime content and strength development of lime-stabilized rammed earth. *Int. J. of Computational Methods and Experimental Measurements*, 9(3), 239–248. <https://doi.org/10.2495/CMEM-V9-N3-239-248>

Ávila, F., Puertas, E., & Gallego, R. (2020). Probabilistic reliability assessment of existing masonry buildings: The church of San Justo y Pastor. *Engineering Structures*, 223, 111160. <https://doi.org/10.1016/j.engstruct.2020.111160>

Conference Proceedings

Martínez-Soto, F., Gallego, R., Puertas, E., & Ávila, F. (2023). Applicability of FFRC and SASW nondestructive techniques to assess the mechanical properties of concrete from early ages. 2nd *International Conference on Construction, Energy, Environment & Sustainability (CEES 2023)*.

Blanca-Hoyos, Á., Ávila, F., Puertas, E., & Gallego, R. (2023). Tradición y sostenibilidad en el siglo XXI: estandarización y fabricación de la tapia. *II Congreso Internacional Sobre Innovación y Sostenibilidad En La Vivienda Social (ISViS)*.

Ávila, F., Fagone, M., Gallego, R., Puertas, E., & Ranocchiali, G. (2023). Experimental evaluation of the compressive and shear behavior of unstabilized rammed earth. In A. Diouri et al. (Eds.), *4th Int. Congress*

on Materials & Structural Stability. Abstracts & Proceedings (pp. 118–119). RILEM. <https://www.rsc-cms23.asmatec.org/AbstractProceedingsCMSS23.php>

Ávila, F., Martínez, J., Puertas, E., Burgos, A., & Gallego, R. (2021). Modelos numéricos para la conservación del patrimonio arquitectónico: la Torre de Comares de la Alhambra (Granada). *Congreso Internacional ICOFORT 2021. Actas*, 299–313.

Teaching-related publications

Ávila, F., Puertas, E., Martínez-Castro, A., & Gallego, R. (2021). *Cálculo Matricial de Estructuras*. Universidad de Granada. <http://hdl.handle.net/10481/67070>

Ávila, F., & Puertas, E. (2020). Gamificación en el aprendizaje de asignaturas técnicas universitarias en entornos presencial y virtual. In E. Sánchez Rivas, E. Colomo Magaña, J. Ruiz Palmero, & J. Sánchez Rodríguez (Eds.), *Tecnologías educativas y estrategias didácticas* (pp. 177–187). UMA Editorial. <https://hdl.handle.net/10630/20345>

Ávila, F., & Puertas, E. (2020). Gamificación para el aprendizaje de asignaturas técnicas universitarias. In E. Sánchez Rivas, E. Colomo Magaña, J. Ruiz Palmero, & J. Sánchez Rodríguez (Eds.), *La tecnología como eje del cambio metodológico* (pp. 1822–1826). UMA Editorial. https://www.umaeditorial.uma.es/libro/la-tecnologia-como-eje-del-cambio-metodologico_2547/

Ávila, F., & Puertas, E. (2020). Introducción de nuevas tecnologías en la enseñanza del Análisis de Estructuras. In M. Paz Bermúdez (Ed.), *XVII Foro Evaluación de la Calidad de la Investigación y de la Educación Superior (FECIES). Libro de resúmenes* (p. 88).

Participation in Projects

Research projects

Title: *Metodología para el análisis de la integridad estructural del patrimonio arquitectónico construido en tapial* (Ref. UGR.20-12). Funding body: Junta de Andalucía (Spain). Dates and duration: 14/09/2021 - 12/12/2022 (15 months). Funded amount: 42800€. PI: Rafael Gallego.

Title: *Revalorización estructural del patrimonio arquitectónico de tapial en Andalucía" (REPATA)* (Ref. A-TEP-182-UGR18). Funding body: Junta de Andalucía (Spain). Dates and duration: 01/01/2020 - 30/06/2022 (30 months). Funded amount: 11900€. PI: Rafael Gallego.

Teaching projects

Title: *Introducción de Herramientas de Divulgación Científica para la mejora en el proceso Enseñanza-Aprendizaje en Ingeniería Estructural*. Dates and duration: 01/09/2022-30/05/2024 (8.3 months). PI: Esther Puertas.

Title: *Incorporación del m-learning en el proceso de aprendizaje en enseñanzas técnicas*. Funding body: Univ. of Granada (Spain). Dates and duration: 20/09/2020-30/05/2021 (8.3 months). PI: Esther Puertas.

Title: *Equipo Docente de la Escuela Técnica Superior de Ingeniería de Caminos, Canales y Puertos de la Universidad de Granada*. Funding body: University of Granada (Spain). Dates and duration: Nov. 2020 – Jun. 2021 (8 months). PI: Mónica López Alonso.

Title: *Aplicaciones para la Docencia Digital en Ciencia e Ingeniería*. Funding body: University of Granada (Spain). Dates and duration: Nov. 2020- Jun. 2021 (8 months). PI: Ignacio F. Sánchez and Diego P. Ruiz

Communications and Lectures

Communications in International Conferences

Title: *Preventive preservation of rammed earth historical heritage through continuous monitoring, architectural inspections and data fusion*. Conference: 10th Euro-American Congress on Construction Pathology, Rehabilitation Technology and Heritage Management (REHABEND 2024). Type of communication: oral communication. Date: 07-09/05/2024. Location: Gijón (Spain)

Title: *Tradición y sostenibilidad en el siglo XXI: estandarización y fabricación de la tapia*. Conference: II Congreso Internacional Sobre Innovación y Sostenibilidad En La Vivienda Social (ISViS). Type of communication: poster. Date: 10/05/2023. Location: Granada (Spain)

Title: *Experimental evaluation of the compressive and shear behavior of unstabilized rammed earth*. Conference: 4th International Congress on Materials & Structural Stability. Abstracts & Proceedings. Type of communication: oral communication. Date: 08/03/2023. Location: Rabat (Morocco)

Title: *Modelos numéricos para la conservación del patrimonio arquitectónico: la Torre de Comares de la Alhambra (Granada)*. Conference: *Congreso Internacional ICOFORT 2021*. Type of communication: oral communication. Date: 20/10/2021. Location: Menorca (Spain)

Title: *Experimental evaluation of the optimum lime content and strength development of lime-stabilized rammed earth* Conference: 10th International Conference on Computational Methods and Experiments in Material and Contact Characterisation. Type of communication: oral communication. Date: 07/07/2021. Location: online.

Other lectures and presentations

Title: *Construir con tierra en el siglo XXI*. Event: Opening Session of the Master in Structures of the University of Granada. Date: 15/11/2022. Location: Granada (Spain)

Title: *'Ciencia de hoy para cuidar el patrimonio de ayer*. Event: Semana de la Ciencia, Edición 2020. Date: 30/11/2020. Location: Granada (Spain)

Title: *Ingeniería Civil en la E.T.S. de Ingeniería de Caminos, Canales y Puertos*. Event: Semana de la Ciencia 2019 (FCT-18-13165). Date: 04/11/2019 - 15/11/2019. Location: Granada (Spain)