

DR. ALEJANDRO JIMÉNEZ RIOS

E-mail:
Mobile:
Skype: <https://orcid.org/0000-0003-4470-255X>
ORCID ID 57203578697
Scopus Author ID https://www.researchgate.net/profile/Alejandro_Jimenez_Rios
ResearchGate <https://tcd.academia.edu/AlejandroJimenezRios>
Academia <https://scholar.google.es/citations?user=KMpFEg4AAAAJ&hl=en>
Google Scholar
LinkedIn https://www.linkedin.com/in/jimnezra/?locale=en_US

RESEARCH INTERESTS

My research interests are closely aligned with the United Nations Sustainable Development Goals and focused specifically in Goal 11: Sustainable cities and communities. My interests include: the conservation of existing built heritage through inspection, diagnosis, intervention design and monitoring of buildings and bridges with historical/cultural value; the study of vernacular and sustainable architecture; the mechanical properties and structural behaviour of masonry and earthen structures through the application of non-destructive testing and advanced numerical simulations; the development and implementation of new technologies in the architecture, construction and engineering (AEC) industry such as artificial intelligence, the internet of things, structural monitoring and digital twins.

QUALIFICATIONS

- 2016-October 2019: **PhD in Civil, Structural and Environmental Engineering**
Trinity College Dublin, Ireland.
Final dissertation project on the conservation of earthen vernacular architecture in Ireland. Study of the mechanical properties and the structural behaviour of cob. Studentship Award holder.
- 2017-2018: **Postgraduate Certificate in Statistics**
Trinity College Dublin, Ireland.
Base module, introduction to regression and design of experiments.
- 2015-2016: **Advanced Master in Structural Analysis of Monuments and Historical Constructions (SAHC)**
Czech Technical University, Czech Republic, and Polytechnic University of Catalonia, Spain.
Final dissertation project on the simulation of masonry structural behaviour using Discrete Element Method.
Erasmus + scholarship holder.
GPA 86.0/100.
- 2009-2014: **Civil Engineering Degree**
University of Guadalajara, Mexico.
Structural Engineering specialization path.
Final dissertation project on the comparative analysis of plane frames' structural behaviour considering the effect of end length offsets.
GPA 94.2/100.

TEACHING AND EXAMINING

- 2021: **New Master Program Creation Committee Member**
University of Guadalajara

- I participated in the committee in charge of designing and implementing a new Master program in the field of Civil Engineering at the Department of Civil and Topography Engineering at University of Guadalajara, Mexico.
- 2019: **Assessment Assistant**
Trinity College Dublin.
Support of Trinity Assessment Fellows to map and analyse assessment practices within Schools across the University. Digital badge on programme-focused assessment.
- 2016-2019: **Teaching Assistant**
Trinity College Dublin.
Teaching assistant at the following engineering courses of the Department of Civil, Structural and Environmental Engineering and Mechanical Engineering:
- 2E9 Engineering design.
 - 3A2 Structural design.
 - 2E8 Materials.
 - 3E4 Innovation and entrepreneurship.
 - 2E4 Solids and structures.
 - 4E6 Advanced theory of structures.
 - 2E4 Solids and structures.
 - 3B3 Mechanics of solids.
 - C05 Spatial analysis using GIS.
- Examination invigilator**
Trinity College Dublin.
Ensuring that examinations commenced, continued and concluded in an orderly and timely manner, and that students were kept under constant and effective supervision throughout an examination.
- 2018-2019: **Cob Workshops**
Trinity College Dublin.
Organization and facilitation of three one-day workshops on conservation, vernacular architecture, earthen construction techniques and sustainability.
- 2018: **Reflective Teaching Assistantship Course**
Trinity College Dublin.
Introduction to current learning theories and teaching practices within higher education. Practical application during an undergraduate lab demonstration.

RESEARCH

- 2020-2022: **Postdoctoral Research Fellow (current position)**
Sapienza University of Rome, Italy
Postdoctoral research project on the study of the structural behaviour of masonry with the use of a non-standard limit analysis method implemented through the ALMA 2.0 program and on the development/extension of this software.
- May-June
2018: **Researcher**
University of Cantabria, Spain.
International research collaboration to design the experimental campaign on the use of minor-destructive tests to determine the mechanical properties of cob.

Scientific journal's reviewer

- 2020-Present **Computational Methods in Structural Engineering for Frontiers Built Environment.**
This new section aims to bridge the gap between numerical methods and computational mechanics in the broader field of structural engineering. **IF:2.195**

(2020).
2019-Present **Construction and Building Materials**
An international journal dedicated to the investigation and innovative use of materials in construction and repair. IF = 4.419 (2020).

Participation per invitation to seminars/conferences

2021 **Mechanical Properties of Existing Cob Walls.**
NET+WORKING BASEhabitat Hybrid Summer School. Organized by BASEhabitat, University of Art and Design Linz, Austria.
Conservation of Earthen Vernacular Buildings with an emphasis on minor destructive tests (MDT) and cob mechanical properties.
Ruins to Riches, Revive, Repurpose, Reimagine Our Traditional Buildings. Organized by Ulster Architectural Heritage, Armagh City Banbridge & Craigavon and the Department for Communities, UK.

Peer reviewed journal papers

2021: **Jiménez, A. R.**, Pingaro, M., Reccia, E., Nela, B. & Trovalusci, P. (In preparation) *Parametric analysis of pointed arches using non-standard limit analysis.* International Journal of Solids and Structures.
Jiménez, A. R., Pingaro, M., Reccia, E., & Trovalusci, P. (Accepted for publication) *Statistical assessment of in-plane masonry panels using limit analysis with sliding mechanisms.* ASCE journal of engineering mechanics, special issue "Recent advances on the mechanics of masonry structures".
2020: **Jiménez, A. R.**, & O'Dwyer, D. (2020) *Experimental validation of the application of the flat jack in cob walls.* Construction and building materials. 254, p.119148. DOI: 10.1016/j.conbuildmat.2020.119148.
Jiménez, A. R., & O'Dwyer, D. (2020). *Data collected from the experimental validation for the application of flat jack tests in cob walls.* Data in brief. 31, p.105764. DOI: 10.1016/j.dib.2020.105764.
Jiménez, A. R., & O'Dwyer, D. (2020). *Flat jack test adapted for its application in cob walls.* MethodsX. 7, p.101003. DOI: 10.1016/j.mex.2020.101003.
2019: **Jiménez, A. R.**, & O'Dwyer, D. (2019). *Numerical modelling of cob's non-linear monotonic structural behaviour.* International Journal of Computational Methods. 17, p.1940013. DOI: 10.1142/S0219876219500464.

Peer reviewed conference papers

2021 Nela, B., Pingaro, M., **Jiménez, A. R.**, Reccia, E., & Trovalusci, P. (Submitted). *Masonry simulations using cohesion parameter as code enrichment for a non-standard limit analysis approach.* Abstract sent to the 7th Mechanics of Masonry Structures Strengthened With Composite Materials – Online Conference.
Jiménez, A. R., Grimes, M. & O'Dwyer, D. W. (2021). *Experimental campaign on the use of the flat jack test in cob walls.* Paper presented at the 12th International Conference on Structural Analysis of Historical Constructions, Barcelona, Spain.
2019 **Jiménez, A. R.**, & O'Dwyer, D. W. (2019). *External post-tensioning system for the strengthening of historical stone masonry bridges.* Paper presented at the 11th International Conference on Structural Analysis of Historical Constructions, Cuzco, Peru.

- 2018: **Jiménez, A. R.**, & O'Dwyer, D. (2018). *Earthen buildings in Ireland*. Paper presented at the 6th International Congress on Construction History, Brussels, Belgium. Shortlisted within the top 10 best papers presented by PhD Students.
- Jiménez, A. R.**, & O'Dwyer, D. (2018). *FEM non-linear modelling of cob using ANSYS*. Paper presented at the 9th International Conference on Computational Methods, Rome, Italy.

Dissertations

- 2019: **Jiménez, A. R.** (2019). *Conservation of earthen vernacular architecture in Ireland. Study of the mechanical properties and the structural behaviour of cob*. PhD thesis. Trinity College Dublin.
- 2016: **Jiménez, A. R.** (2016). *Simulation of structural behavior of masonry using discrete element modeling*. Master thesis. Polytechnic University of Catalonia, Spain.
- 2014: **Jiménez, A. R.** (2014). *Comparative analysis of plane frames' structural behaviour considering the effect of end length offsets*. Bachelor thesis. University of Guadalajara, Mexico.

Other publications

- 2021: **Jimenez, A. R.**, Pingaro, M., Trovalusci, P., Nela, B. and Reccia, E. (2021). *Data from the parametric analysis of masonry pointed arches with limit analysis*, <<https://doi.org/10.5281/zenodo.4681406>> (April).
- 2020: **Jimenez, A. R.**, Pingaro, M., Trovalusci, P., and Reccia, E. (2020a). *Code from the parametric analysis of masonry panels with limit analysis*, <<https://doi.org/10.5281/zenodo.4321939>> (December).
- Jimenez, A. R.**, Pingaro, M., Trovalusci, P., and Reccia, E. (2020b). *Data from the parametric analysis of masonry panels with limit analysis*, <<https://doi.org/10.5281/zenodo.4320201>> (December).
- 2019: **Jiménez, A. R.** (2019). *Proposal for the sustainable reuse and redevelopment of Newtownbutler's Lanesborough Hotel and former Market House*. Poster presented at the Ulster Architectural Heritage & Irish Georgian Society Summer School.
- Jiménez, A. R.** (2019), *Cob wallettes' consolidation data*, Mendeley Data, v1 <http://dx.doi.org/10.17632/twbf86wxtx.1>
- Jiménez, A. R.** (2019), *Cob cylinder's data*, Mendeley Data, v1 <http://dx.doi.org/10.17632/h8ksd6mvkj.1>

Research specific training

- 2021: **Research funding**
Research Academy, Elsevier
- 2019: **Certified Peer Reviewer Course**
Researcher Academy, Elsevier

CONTRIBUTIONS

Professional affiliations

- 2020-Present **CICEJ**
Colegio de Ingenieros Civiles del Estado de Jalisco, Structural Engineering Technical Session
- 2019-Present **IABMAS**
International Association for Bridge Maintenance and Safety
- 2019-Present **EAHN**

- 2019-Present **European Architectural History Network**
INTBAU
International Network for Traditional Building, Architecture and Urbanism
- 2018-2020 **EBUKI**
Earth Building UK and Ireland
- 2017-2020 **Engineers Ireland**
Professional body for engineers and engineering in Ireland.

Volunteering

- 2017-2018: **Postgraduate Research Representative**
Department of Civil, Structural and Environmental Engineering, Trinity College Dublin.
- 2016: **Graduate Students Union (GSU)**
Trinity College Dublin.
- 2013: **Builder**
TECHO, Mexico.

OTHERS

Other education

- 2019: **Conservation Without Frontiers International Summer School**
Ulster Architectural Heritage and Irish Georgian Society
Survival & Revival: Living Towns and Villages in Cavan and Fermanagh.
- 2018: **BASEhabitat International Summer School on Earthen and Bamboo Construction**
University of Linz, Austria.
Practical workshops in building with earth and bamboo, theory classes on sustainable architecture and networking with people from all around the globe.
- 2017: **Academic Skills for Successful Learning Course**
Trinity College Dublin, Ireland.
Leadership, time management, business presentations, communication skills.
- 2015: **Certificate on the Analysis and Design of Post-Tensioned Buildings**
ADAPT Professional Training Institute
- 2012-2013: **International Academic Exchange**
National Institute of Applied Sciences Lyon, France.
Scholarship holder MEXFITEC (México-Francia-Ingenieros-Tecnología).
- MOOCS: **HTML, CSS, and Javascript for Web Developers**
Johns Hopkins University, USA
- Machine learning**
University of Sandford, USA
- Construire en terre crue aujourd'hui**
Amaco, France
- Introduction to Python**
Microsoft, USA
- Roman architecture**
Yale University, USA
- The ancient Greeks**
Wesleyan University, USA
- Rome**
University of Reading, UK
- Cultural heritage in transformation**
RWTH Aachen University, Germany

Arts and heritage management

Bocconi University, Italy

Next generation infrastructures

TU Delft, Netherlands

The art of structures

Polytechnic University of Lausanne, Switzerland

Future smart cities

Swiss Federal Institute of Technology in Zurich, Switzerland

Professional practice experience

2016-Present: **Conservation Engineer**

Freelancer

Consulting on the conservation of monuments and historical constructions.

2020-2021: **Structural Engineer**

Xstructuras.

Modelling, analysing, designing and detailing of steel, concrete and masonry buildings. Working in and coordinating teams, liaising with architects and clients to ensure the completion and success of projects on time and within budget.

2014-2015: **Structural Engineer**

ALBA Proyecto Estructural.

Modelling, analysing, designing and detailing of steel, concrete and masonry buildings. Working in and coordinating teams, liaising with architects and clients to ensure the completion and success of projects on time and within budget.

2014-2014: **Structural Engineer**

Ceromotion.

Modelling, analysing, designing and detailing of steel, concrete and masonry buildings.

2006-2009: **Mason**

Freelancer

3 years of experience in the construction of masonry houses. I worked as a mason and I also carried out some simple electric and hydraulic installations jobs.

Knowledge and skills

Engineering:

- Knowledge of natural materials and construction techniques such as: adobe, rammed earth, cob, bamboo.
- Knowledge of inspection, diagnosis, analysis, design, strengthening and monitoring of monuments and historical constructions.
- Knowledge of ICOMOS charters and conservation philosophy.
- Knowledge of the modelling, analysis, design and detailing of modern steel, concrete and masonry structures.
- Knowledge of building codes: ASCE, ACI, AISC, AASHTO, Eurocodes, CFE and RCDF.

Software:

- Skills with engineering design software: SAP2000, ETABS, SAFE, ANSYS, ABAQUS, AutoCAD, Revit, Robot, Formit, SeismoSignal, Prodisis, Paraview, ALMA.
- Skills with statistical software: Minitab.
- Skills with programming languages: MATLAB, Python, VBA, XML, HTML, CSS, Javascript.
- Skills with developer software: VSCode, Spyder, Vim, Git.
- Skills with other software: Word, Excel, PowerPoint, Outlook, Project, Visio, Survey Monkey, Prezi, EndNote, LaTeX, Mendeley.

- Languages:
- Spanish: Mother tongue.
 - English: Advanced.
 - French: Intermediate.
 - Italian: Beginner.

Referees

Dermot O'Dwyer

Associate Professor and PhD Supervisor

Department of Civil, Structural and Environmental Engineering. Trinity College Dublin, Ireland.

Email: dwodwyer@tcd.ie

Website: <https://www.tcd.ie/civileng/people/dwodwyer/>