

Gustavo A. Araújo R.

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Profile

I am a PhD student in Civil Engineering at the John A. Blume Earthquake Engineering Center at Stanford University. My research focuses on nonlinear finite-element modeling and experimental testing of civil structures under earthquake loads.

My journey in this field began with a BS and MS from Universidad del Norte, Colombia, under Prof. Carlos A. Arteta, followed by an MS in Wood Science at Oregon State University, where I explored hybrid mass timber-steel systems with Profs. Barbara G. Simpson, Andre R. Barbosa, and Arijit Sinha. Currently, at Stanford, I am working on accelerating finite element analyses using GPUs and CUDA C++ to overcome computational limitations in high-fidelity numerical models.

Additionally, I contribute to the earthquake engineering community through my active participation in the Earthquake Engineering Research Institute's Student Leadership Council, helping organize the Undergraduate Seismic Design Competition.

Education

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| Expected 2026 | PhD in Civil Engineering , <i>Stanford University</i> , Stanford, CA, United States.
Advisor: Prof. Barbara G. Simpson |
| 2023 | MS in Wood Science , <i>Oregon State University</i> , Corvallis, OR, United States, GPA = 4.0/4.0.
Thesis: "Design, Experimental Testing, and Numerical Analysis of a Three-Story Mass Timber Building with a Pivoting Spine and Buckling-Restrained Energy Dissipators"
Advisor: Prof. Arijit Sinha |

- 2021 **MS in Civil Engineering**, *Universidad del Norte*, Barranquilla, ATL, Colombia, GPA = 4.48/5.0.
Thesis: "Seismic Risk Assessment of the Thin and Lightly Reinforced Concrete Wall Building System"
Advisor: Prof. Carlos A. Arteta
- 2018 **BS in Civil Engineering**, *Universidad del Norte*, Barranquilla, ATL, Colombia, GPA = 4.4/5.0 .

Research interests

- Nonlinear finite-element modeling of civil structures
- Reinforced concrete wall buildings and moment-resisting frames
- Hybrid mass timber-steel systems

Relevant Skills

- Nonlinear numerical modeling of civil structures (OpenSees and ETABS)
- Proficient in programming for numerical modeling and data analysis (Python and MATLAB)
- Experience in experimental testing of mass timber systems

Languages

Spanish	Native
English	Proficient
French	Beginner

Academic Experience

- 2023–Present **Graduate Research Assistant**, *Stanford University*, Stanford, CA, United States.
Project: "Accelerating FEA of Civil Structures with GPU Computing", funded by the National Science Foundation
- 2020–2022 **Graduate Research Assistant**, *Oregon State University*, Corvallis, OR, United States.
Project: "Innovative Lateral Systems", funded by the National Science Foundation, the USDA Agricultural Research Services, and the Tallwood Design Institute.
- 2018–2019 **Graduate Teaching Assistant**, *Universidad del Norte*, Barranquilla, ATL, Colombia.
Course: Statics

- 2018–2019 **Graduate Research Assistant**, *Universidad del Norte*, Barranquilla, ATL, Colombia.
Project: “Seismic Risk of Thin Wall Buildings in Colombia”
- 2017 **PEER Summer Intern**, *University of California, Berkeley*, Berkeley, CA, United States.
Project: “Nonlinear Modeling of Thin Wall Buildings”

Industry Experience

- 2017–2019 **Engineer in Training**, *Ingenia Structural Co*, Barranquilla, ATL, Colombia.
Structural analysis and design of reinforced concrete structures.

Memberships

- 2023–2024 **Lead SDC Chair**, *EERI Student Leadership Council*.
- 2022–2023 **SDC Chair**, *EERI Student Leadership Council*.

Fellowships and Awards

- 2023 **PEER Lightning Talks Contest (Runner-up)**, *University of California, Berkeley*, Berkeley, CA, United States.
- 2022 **PEER Pitches Contest (Winner)**, *University of California, Berkeley*, Berkeley, CA, United States.
- 2020–2022 **Tallwood Design Institute Fellowship**, *Oregon State University*, Corvallis, OR, United States.
- 2020 **Provost’s Distinguished Graduate Scholarship**, *Oregon State University*, Corvallis, OR, United States.
- 2020 **Diversity Scholar Recruitment Award**, *Oregon State University*, Corvallis, OR, United States.
- 2021 **Cum Laude Distinction (MS Thesis)**, *Universidad del Norte*, Barranquilla, ATL, Colombia.
- 2018 **Diploma for Graduate of Excellence**, *Universidad del Norte*, Barranquilla, ATL, Colombia.
- 2016–2017 **French Language Seedbed Program**, *Universidad del Norte*, Barranquilla, ATL, Colombia.
- 2013–2017 **Orgullo Caribe Scholarship**, *Universidad del Norte*, Barranquilla, ATL, Colombia.

Journal Papers

- Araújo R., G. A.**, Simpson, B. G., Barbosa, A. R., Pieroni, L., Ho, T. X., Orozco O., G. F., Miyamoto, B. T., & Sinha, A. (2024). Experimental and numerical simulation of a three-story mass timber building with a pivoting wall and buckling-restrained boundary elements. *Journal of Structural Engineering*, In Review.
- Arteta, C., Carrillo, J., Archbold, J., Gaspar, D., Pajaro, C., **Araujo, G.**, Torregroza, A., Bonett, R., Blandon, C., Fernandez-Sola, L., Correal, J. F., & Mosalam, K. M. (2019). Response of Mid-Rise Reinforced Concrete Frame Buildings to the 2017 Puebla Earthquake. *Earthquake Spectra*, 35(4), 1763–1793. <https://doi.org/10.1193/061218EQS144M>
- Arteta, C., **Araújo, G. A.**, Torregroza, A. M., Martínez, F. M., & Lu, Y. (2019). Hybrid approach for simulating shear–flexure interaction in RC walls with nonlinear truss and fiber models. *Bulletin of Earthquake Engineering*, 17, 6437–6462. <https://doi.org/10.1007/s10518-019-00681-6>

Conference Papers

- Pieroni, L., **Araújo R., G. A.**, Simpson, B., Freddi, F., Mishra, P., Uarac, P., Barbosa, A. R., Sinha, A., van de Lindt, J. W., & Brown, N. (2024). Estimating First and Higher-Mode Effects for the Design of Rocking Mass Timber Walls with Controlled Overturning Moments. In *World Conference on Earthquake Engineering, WCEE 2024*.
- Araújo R., G. A.**, Simpson, B. G., Zhu, M., & Scott, M. H. (2024). Accelerating Finite-Element Structural Elastic Dynamic Analysis Using GPU Computing. In *World Conference on Earthquake Engineering, WCEE 2024*.
- Araujo R., G. A.**, Simpson, B. G., Ho, T. X., Orozco O., G. F., Barbosa, A. R., & Sinha, A. (2023). Cyclic Testing and Numerical Modeling of a Three-Story Mass-Timber Building with a Pivoting Mass Ply Panel Spine and Buckling-Restrained Energy Dissipators. In *Proceedings of the 2023 World Conference on Timber Engineering*.
- Orozco O., G. F., Ho, T. X., **Araújo R., G. A.**, Barbosa, A. R., Sinha, A., & Simpson, B. G. (2022). Innovative Mass Timber Seismic Lateral Force Resisting Systems: Testing of a Full-scale Three-story Building with Mass Ply Panels (MPP) Rocking Walls. In *Proceedings of the 12th National Conference on Earthquake Engineering*. Earthquake Engineering Research Institute.
- Araujo R., G. A.**, Simpson, B. G., Ho, T. X., Orozco O., G. F., Barbosa, A. R., & Sinha, A. (2022a). Design of a Three-story Building Using a Hybrid of Mass Ply Panel Walls with Buckling-Restrained Braces. *Proceedings of the 12th National Conference on Earthquake Engineering*.
- Araujo R., G. A.**, Simpson, B. G., Ho, T. X., Orozco O., G. F., Barbosa, A. R., & Sinha, A. (2022b). Numerical Modelling of a Three-Story Building Using a Hybrid of Mass Timber Walls with Buckling-Restrained Braces. In F. Mazzolani, D. Dubina, & A. Stratan (Eds.), *Proceedings of the 10th International Conference on Behaviour of*

Steel Structures in Seismic Areas. Springer. https://doi.org/10.1007/978-3-031-03811-2_45

Segura, C. L., Arteta, C. A., **Araujo, G.**, & J., W. (2018). Flexural Compression Capacity of Thin Reinforced Concrete Structural Walls. *Proceedings of the 11th National Conference on Earthquake Engineering*.

Theses and Dissertations

Araujo R., G. A. (2022). *Design, Experimental Testing, and Numerical Analysis of a Three-Story Mass Timber Building with a Pivoting Spine and Buckling-Restrained Energy Dissipators* (M.S. thesis). Oregon State University. Corvallis, OR, United States. https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/k643b860n

Araujo R., G. A. (2021). *Seismic Risk Assessment of the Thin and Lightly Reinforced Concrete Wall Building System* (M.S. thesis). Universidad del Norte. Barranquilla, Colombia. <http://hdl.handle.net/10584/9495>

Poster and Presentations

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| February 1, 2024 | "Accelerating Finite-Element Structural Elastic Dynamic Analysis Using GPU Computing". 2024 NHERI Computational Symposium. Los Angeles, CA, United States. |
| August 24, 2023 | "Design Procedure for Pivoting and Rocking Mass Timber Walls with Controlled Overturning Moment". 2023 PEER Annual Meeting. Berkeley, CA, United States. |
| June 21, 2023 | "Cyclic Testing and Numerical Modeling of a Three-Story Mass-Timber Building with a Pivoting Mass Ply Panel Spine and Buckling-Restrained Energy Dissipators". 2023 World Conference on Timber Engineering. Oslo, Norway |
| June 29, 2022 | "Design of a Three-story Building Using a Hybrid of Mass Ply Panel Walls with Buckling-Restrained Braces". 12th National Conference on Earthquake Engineering. Salt Lake City, UT, United States |
| May 27, 2022 | "Numerical Modelling of a Three-Story Building Using a Hybrid of Mass Timber Walls with Buckling-Restrained Braces". 10th International Conference on Behaviour of Steel Structures in Seismic Areas. Timisoara, Romania |