

Bryan Chalarca Echeverri

Curriculum Vitae

✉ bryan.chalarca@iusspavia.it

PERSONAL INFORMATION

Name: Bryan.
Surname: Chalarca Echeverri.
Place of birth: Santuario, Risaralda, Colombia.
ResearchGate: https://www.researchgate.net/profile/Bryan_Chalarca
Google Scholar: <https://scholar.google.com/citations?user=bLSM17wAAAAJ>
Research Group: <https://sites.google.com/iusspavia.it/nonstructural/>

SCIENTIFIC INTERESTS

Structural engineering, earthquake engineering, seismic protection systems, nonstructural elements, new structural/nonstructural systems, structural identification.

EDUCATION

- 2017 – 2021 **Doctor of Philosophy in Earthquake Engineering and Engineering Seismology**, UME-ROSE School, University School for Advanced Studies IUSS Pavia, Italy.
Thesis: Implementation of Fluid Viscous Dampers as a Seismic Protection System and Its Effects on the Structural and Nonstructural Seismic Response.
Supervisor: Prof. Dr. André Filiatrault and Prof. Dr. Daniele Perrone.
- 2015 – 2016 **Master of Science in Earthquake Engineering**, Erasmus Mundus MEEES Program. University School for Advanced Studies IUSS Pavia, Italy, and Middle East Technical University, Turkey.
Thesis: Collapse Capacity of Steel Buildings Retrofitted with Linear and Nonlinear Viscous Dampers.
Supervisor: Prof. Dr. André Filiatrault.
- 2013 – 2014 **Specialization in Structures**, *Department of Civil Engineering*, Universidad Nacional de Colombia at Manizales, Colombia.
- 2008 – 2013 **Civil Engineering**, *Department of Civil Engineering*, Universidad Nacional de Colombia at Manizales, Colombia.

TEACHING EXPERIENCE

December, 2023 – April, 2024 **Master's thesis supervisor**, *Title: Assessment of the structure - external frame interaction during a seismic event.*

2024 Master's in Civil Engineering, Department of Civil Engineering and Architecture, Faculty of Engineering. University of Pavia, Italy.

Student: Eng. Simone Oglina.

November, 2023 – March, 2024 **Master's thesis supervisor**, *Title: Influence of structural damping on the computation of seismic demand on nonstructural elements.*

2024 Master's in Civil Engineering, Department of Civil Engineering and Architecture, Faculty of Engineering. University of Pavia, Italy.

Student: Eng. Edoardo Giorgio.

December, 2019 – September, 2022 **Master's thesis supervisor**, *Title: New seismic design approach for concrete shear wall buildings implementing base isolation.*

September, 2022 Master's in Engineering - Structures, Faculty of Engineering and Architecture, Universidad Nacional de Colombia at Manizales, Colombia.

Student: Eng. Jorge Alexander Niño Castaño.

Fall semester 2020-2021 **Teaching assistant**, *Course: Seismic Isolation and Dissipation*, University School for Advanced Studies IUSS Pavia, Italy.

Supervisor: Prof. Dr. André Filiatrault.

Fall semester 2018-2019 **Teaching assistant**, *Course: Seismic Isolation and Dissipation*, University School for Advanced Studies IUSS Pavia, Italy.

Supervisor: Prof. Dr. André Filiatrault.

January - December, 2013 **Teaching assistant**, *Course: Advanced Structural Design*, Universidad Nacional de Colombia at Manizales, Colombia.

Supervisor: Prof. Dr. Daniel Bedoya Ruiz.

RESEARCH EXPERIENCE

November, 2023 – Currently **Research fellow**, *Project: DesRack at the University of Pavia*

2023 – Currently Developing innovative seismic protection solutions for non-structural elements for logistics and industrial plants.

Supervisor: Dr. Giammaria Gabbianelli.

January, 2022 – September, 2023 **Research fellow**, *Project: Progetto DPC-ReLUIS 2022-2024: Contributi normativi relativi a componenti non strutturali at University School for Advanced Studies IUSS Pavia, Italy.*

2023 Calibration of response modification coefficients for nonstructural elements.

Supervisor: Prof. Dr. André Filiatrault.

- October, 2021 – September, 2023 **Research fellow**, *Project: Progetto CADs: Creazione di un Ambiente Domestico Sicuro at University School for Advanced Studies IUSS Pavia, Italy.*
Development of innovative seismic protection solutions for nonstructural elements.
Supervisor: Prof. Dr. André Filiatrault and Prof. Dr. Roberto Nascimbene.
- 2019 – 2021 **Doctoral student**, *Project: Progetto DPC-ReLUIS 2019-2021: Contributi normativi relativi a componenti non strutturali at University School for Advanced Studies IUSS Pavia, Italy.*
Assessment of the seismic demand on acceleration-sensitive nonstructural elements on buildings equipped with fluid viscous dampers.
Supervisor: Prof. Dr. André Filiatrault.
- 2018 – 2022 **Doctoral student**, *Project: Progetto Dipartimenti di Eccellenza 2018-2022 at University School for Advanced Studies IUSS Pavia, Italy.*
Assessment of the seismic demand on acceleration-sensitive nonstructural elements on buildings equipped with fluid viscous dampers.
Supervisor: Prof. Dr. André Filiatrault.
- March, 2014 – February, 2015 **Young Researcher**, *Project: Experimental behavior and stochastic analysis of dry post-tensioned masonry under simulated seismicity at Universidad Nacional de Colombia at Manizales, Colombia.*
Supervisor: Prof. Dr. Daniel Bedoya Ruiz.
- 2013 – 2014 **Research assistant**, *Project: Study and seismic behaviour of low-cost material structures such as ferrocement, using experimental, deterministic and stochastic analysis at Universidad Nacional de Colombia at Manizales, Colombia.*
Supervisor: Prof. Dr. Daniel Bedoya Ruiz.

PUBLICATIONS

PEER-REVIEWED JOURNAL PAPERS

- [7] **Bryan Chalarca, André Filiatrault, Daniele Perrone**, Expected Seismic Response and Annual Seismic Loss of Viscoously Damped Braced Steel Frames. *Engineering Structures*. 2024. DOI: <https://doi.org/10.1016/j.engstruct.2024.117569>.
- [6] **Jorge A. Niño, Bryan Chalarca, Daniel Bedoya-Ruiz**, Influence of seismic isolation on the seismic design of buildings with reinforced concrete wall structure. *Ingeniería y Competitividad*. 2024. DOI: <https://doi.org/10.25100/iyc.v26i1.12779>
- [5] **Bryan Chalarca, Giammaria Gabbianelli, Daniel Bedoya-Ruiz, Roberto Nascimbene**, Experimental and numerical simulation dataset of a ferrocement wall subjected to fully-reversed cyclic load test. *Data in Brief*. 2024. DOI: <https://doi.org/10.1016/j.dib.2024.110095>.

- [4] **Bryan Chalarca, André Filiatrault, Daniele Perrone**, Influence of fluid viscous damper stiffness on the floor acceleration response of steel moment-resisting frames under far-field ground motions. *Journal of Earthquake Engineering*. 2023. DOI: 10.1080/13632469.2023.2282993
- [3] **Bryan Chalarca, Daniel Bedoya-Ruiz, Juan P. Herrera**, Experimental behavior and seismic performance assessment of Unbonded Post-tensioned Precast Concrete Walls for low-rise buildings. *Engineering Structures*. 2023 289. DOI: <https://doi.org/10.1016/j.engstruct.2023.116251>.
- [2] **Bryan Chalarca, André Filiatrault, Daniele Perrone**, Parametric Study and Prediction Models of the Seismic Response of Single-Degree-of-Freedom Structural Systems Equipped with Maxwell Material Fluid Viscous Dampers. *Structures*. 2022 3(1). DOI: 10.1016/j.istruc.2022.06.051
- [1] **Bryan Chalarca, André Filiatrault, Daniele Perrone**, Seismic Demand on Acceleration-Sensitive Nonstructural Components in Viscously Damped Braced Frames. *ASCE Journal of Structural Engineering*. 2020 146(9). DOI: 10.1061/(ASCE)ST.1943-541X.0002770

CONFERENCE PROCEEDINGS

- [12] **Bryan Chalarca, Carlos Grajales-Ortiz**, Influence of site effects on several floor response parameters of a steel moment-resisting frame. *Proceedings of the 18th World Conference on Earthquake Engineering*. Milan, Italy. June 30th - July 5th, 2024. (Accepted)
- [11] **Bryan Chalarca, André Filiatrault, Daniele Perrone**, Seismic response models for steel moment-resisting frames equipped with fluid viscous dampers. *Proceedings of the 18th World Conference on Earthquake Engineering*. Milan, Italy. June 30th - July 5th, 2024. (Accepted)
- [10] **Jorge A. Niño, Bryan Chalarca, Daniel Bedoya-Ruiz**, Use of seismic isolation on limited ductility reinforced concrete shear wall buildings: a case study. *Proceedings of the 18th World Conference on Earthquake Engineering*. Milan, Italy. June 30th - July 5th, 2024. (Accepted)
- [9] **Bryan Chalarca, André Filiatrault, Daniele Perrone, Roberto Nascimbene**, Seismic Response of a Braceless Seismic Restraint System for Suspended Nonstructural Elements. *Proceedings of the Fifth International Workshop on Seismic Performance of Non-Structural Elements*. Stanford, United States. December 5-7, 2022.
- [8] **Bryan Chalarca, André Filiatrault, Daniele Perrone, Roberto Nascimbene**, Braceless seismic restraints for suspended nonstructural elements. *Proceedings of the Third European Conference on Earthquake Engineering and Seismology*. Bucharest, Romania. September 4-9, 2022.

- [7] **Wilson Carofilis, Bryan Chalarca**, Comparative Study of the Seismic Demand Estimation on Acceleration-Sensitive Nonstructural Elements. *Proceedings of the First Croatian Conference on Earthquake Engineering*. Zagreb, Croatia. March 22-24, 2021.
- [6] **Bryan Chalarca, André Filiatrault, Daniele Perrone**, Earthquake Economic Losses in Moment-Resisting Steel Frames Equipped with Fluid Viscous Dampers. *Proceedings of the 17th World Conference on Earthquake Engineering*. Sendai, Japan. September 13-18, 2020.
- [5] **Bryan Chalarca, André Filiatrault, Daniele Perrone**, Seismic Performance of Steel Moment-Resisting Frame Retrofitted with Linear and Nonlinear Viscous Dampers. *Proceedings of the 16th World Conference on Seismic Isolation, Energy Dissipation and Active Vibration Control of Structures*. Saint-Petersburg, Russia. July 1-6, 2019.
- [4] **Bryan Chalarca, André Filiatrault, Daniele Perrone**, Floor Acceleration Demand on Steel Moment Resisting Frame Buildings Retrofitted with Linear and Nonlinear Viscous Dampers. *Proceedings of the Fourth International Workshop on Seismic Performance of Non-Structural Elements*. Pavia, Italy. May 22-23, 2019.
- [3] **Bryan Chalarca, Daniel Bedoya-Ruiz, Diego A. Álvarez, Jorge E. Hurtado**, Behavior of precast ferrocement walls under cyclic loading. *Proceedings of the 11th International Symposium on Ferrocement FERRO-11 and International Conference on Textile Reinforced Concrete 3rd ICTRC*. Aachen, Germany. June 7-10, 2015.
- [2] **Daniel Bedoya-Ruiz, Bryan Chalarca, Felipe Uribe, Diego A. Álvarez, Jorge E. Hurtado**, Strength assessment of sandwich-type ferrocement structural walls under cyclic loading. *Proceedings of the 11th International Symposium on Ferrocement FERRO-11 and International Conference on Textile Reinforced Concrete 3rd ICTRC*. Aachen, Germany. June 7-10, 2015.
- [1] **Felipe Uribe, Diego A. Álvarez, Jorge E. Hurtado, Bryan Chalarca, Daniel Bedoya-Ruiz**, Hysteresis parameter identification and reliability assessment of ferrocement walls. *Proceedings of the 11th International Symposium on Ferrocement FERRO-11 and International Conference on Textile Reinforced Concrete 3rd ICTRC*. Aachen, Germany. June 7-10, 2015.

PATENTS

May, 2023 **Seismic Restraint Device for Suspended Elements**, *Bryan Chalarca, Daniele Perrone, André Filiatrault, and Roberto Nascimbene*, University School for Advanced Studies IUSS Pavia, Italy, Italian Patent filed on May 8, 2023. Application number 102023000009123.

INVITED TALKS AND SHORT LECTURES

- [8] **Bryan Chalarca**, Design of fluid viscous dampers based on the ASCE 7-22. *Escuela Superior Politécnica del Litoral*. Guayaquil, Ecuador. April 19, 2023.

- [7] **Bryan Chalarca**, Introduction to Supplemental Damping and Seismic Isolation. *Universidad Nacional de Colombia at Manizales, Colombia. Biannual from 2018 to 2021.*
- [6] **Bryan Chalarca**, Passive Seismic Protection Systems and their Impact in the Structural and Nonstructural Seismic Performance. *Escuela Superior Politécnica del Litoral. Guayaquil, Ecuador. July 15, 2021.*
- [5] **Bryan Chalarca**, Fundamentals and Current Advances of Earthquake Engineering. *Universidad Especialidades Espíritu Santo. Guayaquil, Ecuador. July 2, 2021.*
- [4] **Bryan Chalarca**, Seismic Demand on Acceleration-Sensitive Nonstructural Components in Viscously Damped Braced Frames. *ROSE Seminars, Pavia. November 25, 2020.*
- [3] **Bryan Chalarca**, Fundamentals of Earthquake Engineering. *Universidad Nacional de Colombia at Manizales, Colombia. October 10, 2020.*
- [2] **Bryan Chalarca**, Seismic Performance of Steel Moment-Resisting Frame Retrofitted with Linear and Nonlinear Viscous Dampers. *The 5th International Nigel Priestley Seminar. Pavia, Italy. May 23-24, 2019.*
- [1] **Bryan Chalarca**, Collapse Capacity of Steel Buildings Retrofitted with Linear and Nonlinear Viscous Dampers. *The 3rd International Nigel Priestley Seminar. Pavia, Italy. May 25-26, 2017.*

SERVICE

- January, 2023 **Doctoral qualifying exam committee**, *Doctoral program in Engineering - Structures, Universidad Nacional de Colombia, Manizales, Colombia.*
- December, 2022 **Scientific committee**, *Fifth International Workshop on the Seismic Performance of Non-Structural Elements SPONSE, Stanford, United States.*
- May, 2021 **Advisory committee**, *Master's in Seismic-Resistance Civil Structures, Escuela Superior Politécnica del Litoral, Guayaquil, Ecuador.*
- December, 2020 **Defense committee**, *Master's in Engineering - Structures, Universidad Nacional de Colombia, Manizales, Colombia.*
- June, 2020 – **Web developer and webmaster**, *Website of the Nonstructural Elements Research at the University School for Advanced Studies IUSS Pavia, Pavia, Italy.*
<https://sites.google.com/iusspavia.it/nonstructural/>
- July, 2018 **Scientific committee**, *12th International symposium on Ferrocement and thin cement Composites Ferro 12, Belo Horizonte, Brazil.*

PROFESSIONAL EXPERIENCE

- March, 2022 **Structural Designer**, *Project: Dwelling house in Santuario, Risaralda, Colombia.*
Structural design of a dwelling house with 130.0 square meters of built area.
- January, 2018 **Structural Designer**, *Project: Dwelling house in Santuario, Risaralda, Colombia.*
Structural design of a dwelling house with 150.0 square meters of built area.
- January, 2018 **Structural Designer**, *Project: New roof terrace in Santuario, Risaralda, Colombia.*
Structural design of a new roof terrace with 19.0 square meters of built area.
- December, 2017 **Structural Designer**, *Project: Dwelling houses in Santuario, Risaralda, Colombia.*
Structural design of two dwelling houses with 286.0 (143.0 each) square meters of built area.
- April-August, 2015 **Assistant Engineer**, *Company: Eng. Felipe Correa Gutiérrez.*
Design of non-structural elements for several projects in the department of Cesar, Colombia. Draw of structural plans, creation of structural reports, seismic vulnerability studies.
- July, 2015 **Structural Designer**, *Project: Dwelling house in Santuario, Risaralda, Colombia.*
Structural design of a dwelling house with 132.0 square meters of built area.
- May, 2015 **Structural Consultant**, *Project: Club Tatamá Santuario S.A. in Santuario, Risaralda, Colombia.*
Report with the guidelines for the vulnerability study of a two-story building with a built area of 1000 square meters. Report with the guidelines for the construction of an emergency exit which includes the construction of a new staircase.
- March, 2014 **Structural Designer**, *Project: Dwelling house in Villamaria, Caldas, Colombia.*
Structural design of a dwelling house with 50.0 square meters of built area.

GRANTS AND HONORS

- September 2022 **Recognition for contributions**, "Regalías Bien Invertidas" *award to the project* Strengthening of institutional research and technology transfer capacities of the Universidad Nacional de Colombia at Manizales: Strengthening of characterization of materials and structures, Universidad Nacional de Colombia, Manizales, Colombia.
- 2017 – 2021 **Doctoral Scholarship**, *Doctoral program in Earthquake Engineering and Engineering Seismology, UME-ROSE School, University School for Advanced Studies IUSS Pavia, Italy.*
- 2015 – 2016 **Erasmus Mundus Partner Country Scholarship**, *Master in Earthquake Engineering, MEEES Program, Turkey - Italy.*
- 2013 – 2014 **COLCIENCIAS Young Researcher grant**, *(COLCIENCIAS is the Colombian research promoter institute), Colombia.*

- 2014 **Best grades of the Specialization in Structures program**, *Universidad Nacional de Colombia at Manizales*, Colombia.
- 2013 **Best grades of the Civil Engineering program**, *Universidad Nacional de Colombia at Manizales*, Colombia.
- 2006 **Best Bachelors of the Country**, *(It is a special admission program for the best high school students) Universidad Nacional de Colombia*, Colombia.

LANGUAGES

Spanish Native language
English Excellent
Italian Good

TOEFL iBT Score: 101/120; Date: 12/2014