



# LUÃ GUEDES COSTA

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## PROFILE

I'm a Ph.D. in Mechanical Engineering and a Professor at the Federal University of Rio de Janeiro. My research focuses on nonlinear mechanics phenomena and computational modeling, including energy harvesting, smart materials and structures, nonlinear dynamics, multistability, chaos, and high-performance computing. I've received awards related to innovation and research activities, notably winning the Invent for the Planet 2019 (Texas A&M University), for the development of a set of devices to enhance the mobility of visually impaired individuals, and the ABCM-Springer Award for the best Ph.D. dissertation given by the Brazilian Association of Mechanical Sciences and Engineering (ABCM).

## EXPERIENCE

### Professor

Apr 2025 - Present

Universidade Federal do Rio de Janeiro, Brazil  
Department of Mechanical Engineering.

### Postdoctoral Researcher

Jul 2024 - Apr 2025

Center for Nonlinear Mechanics, Universidade Federal do Rio de Janeiro, Brazil  
Activities: Design and development of new nonlinear smart systems and structures.

### Doctoral Researcher

Mar 2020 - Jul 2024

Center for Nonlinear Mechanics, Universidade Federal do Rio de Janeiro, Brazil  
Activities: Design, development and analysis of new types of nonlinear energy harvesters.

### Co-Founder and Manager

Mar 2020 - 2022

Tupan Acessibilidade, Brazil  
Activities: Management and development of accessibility technology.

### Research Assistant

Mar 2018 - Jan 2020

Centro Federal de Educação Tecnológica Celso Suckow da Fonseca (CEFET/RJ).  
Activities: Analysis of bistable piezoelectric energy harvesters using reduced-order models.

### Undergraduate Research Program

Jun 2017 - Dec 2017

Centro Federal de Educação Tecnológica Celso Suckow da Fonseca (CEFET/RJ).  
Activities: Dynamical analysis of energy harvesting systems using finite element method.

## EDUCATION

### PhD in Mechanical Engineering

2020 - 2024

Universidade Federal do Rio de Janeiro (COPPE/UFRJ), Brazil.

### Master's Degree in Mechanical Engineering and Materials Technology

2018 - 2020

Centro Federal de Educação Tecnológica Celso Suckow da Fonseca (CEFET/RJ), Brazil.

### Degree in Mechanical Engineering

2011 - 2017

Centro Federal de Educação Tecnológica Celso Suckow da Fonseca (CEFET/RJ), Brazil.

## AWARDS 🏆

<b>ABCm–Springer Award</b> Best Ph.D. dissertation in Mechanical Engineering, 2024.	Nov 2025
<b>ABCm Best Paper Award</b> 9th International Symposium on Solid Mechanics (MECSOL 2024).	Oct 2024
<b>Best PhD Student Paper Award</b> XIX International Symposium on Dynamic Problems in Mechanics (DINAME 2023).	Feb 2023
<b>Winner of Invent for the Planet 2019</b> Texas A&M, US. Global contest of technology and innovation for real-world challenges. Winning Project: Team Tupã	Apr 2019

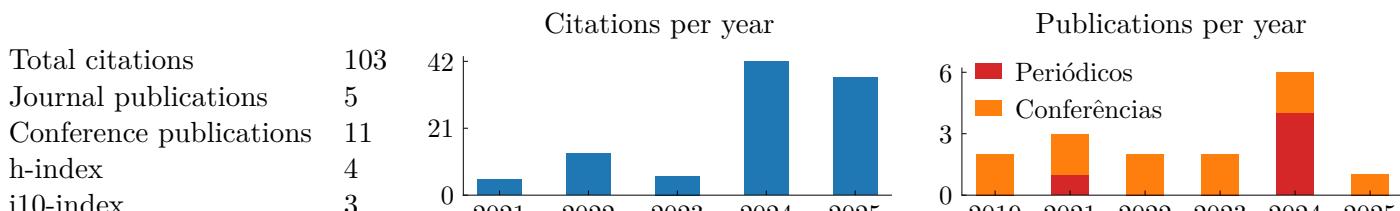
## ADDITIONAL TRAINING ✨

<b>School of Advanced Sciences on Nonlinear Dynamics</b> Universidade de São Paulo, São Paulo, Brazil.	Aug 2019
<b>Oratory</b> Rogéria Guida Oratory Course, Rio de Janeiro, Brazil.	2017
<b>Undergraduate Exchange Program in Mechanical Engineering</b> Technological University Dublin (Former Dublin Institute of Technology), Ireland.	2015 - 2016

## PEER REVIEW 📝

<b>International Journal of Mechanical Sciences</b> Elsevier.	2021 - 2024
<b>Nonlinear Dynamics</b> Springer Nature.	2023 - 2024
<b>Journal of Vibration and Control</b> SAGE Journals.	2020 - 2023
<b>Journal of Computational and Nonlinear Dynamics</b> ASME.	2023 - 2024
<b>Journal of Vibration Engineering &amp; Technologies</b> Springer Nature.	2024 - 2025
<b>Journal of the Brazilian Society of Mechanical Sciences and Engineering</b> Springer Nature.	2025
<b>International Nonlinear Dynamics Conference (NODYCON)</b> Springer Nature.	2025

## RESEARCH METRICS 📈



Google Scholar metrics (from 10/30/2025)

## JOURNAL PUBLICATIONS

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2024

**Costa, L. G;** Savi, M. A. "Complex nonlinear dynamics of a multidirectional energy harvester with hybrid transduction". *Smart Materials and Structures*, v. 33, p. 115007, 2024.

**Costa, L. G;** Savi, M. A. "Pendulum-based hybrid system for multidirectional energy harvesting". *Nonlinear Dynamics*, v. 112, n. 21, p. 18665-18684, 2024.

**Costa, L. G;** Monteiro, L. L. S.; Savi, M. A. "Multistability investigation for improved performance in a compact nonlinear energy harvester". *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, v. 46, n. 4, p. 212, 2024.

**Costa, L. G;** Savi, M. A. "Nonlinear dynamics of a compact and multistable mechanical energy harvester". *International Journal of Mechanical Sciences*, v. 262, p. 108731, 2024.

2021

**Costa, L. G;** Monteiro, L. L. S.; Pacheco P. M. C. L.; Savi, M. A. "A parametric analysis of the nonlinear dynamics of bistable vibration-based piezoelectric energy harvesters". *Journal of Intelligent Material Systems and Structures*, v. 32, n. 7, p. 699-723, 2021.

## CONFERENCE PUBLICATIONS

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2025

**Costa, L. G;** Savi, M. A. "Nonlinear dynamics perspective framework employed to the analysis of energy harvesters". *Proceedings of the XX International Symposium on Dynamic Problems of Mechanics*, 2025.

2024

**Costa, L. G;** Savi, M. A. "Mechanical energy multi-harvesting: on the performance enhancement of mechanical energy harvesters". *Proceedings of the 9th International Symposium on Solid Mechanics*, 2024.

**Costa, L. G;** Savi, M. A. "Analysis of a multidirectional hybrid energy harvester". *Anais do Congresso Nacional de Engenharia Mecânica*, 2024.

2023

**Costa, L. G;** Savi, M. A. "Analysis of mechanical energy harvesters using a nonlinear dynamics perspective". *Proceedings of the XIX International Symposium on Dynamic Problems of Mechanics*, 2023.

**Costa, L. G;** Savi, M. A. "A prototype for hybrid and multidirectional energy harvesting using pendulum structures". *Proceedings of the 27th International Congress of Mechanical Engineering*, 2023.

2022

**Costa, L. G;** Caetano, V. J.; Savi, M. A. "Nonlinear dynamics of an oscillator-pendulum energy harvester". *Anais do Congresso Nacional de Engenharia Mecânica*, 2022.

**Costa, L. G;** Monteiro, L. L. S.; Savi, M. A. "Vibration energy harvesting using a two-degree of freedom duffing-type structure". *Proceedings of the 8th International Symposium on Solid Mechanics*, 2022.

2021

**Costa, L. G;** Monteiro, L. L. S.; Savi, M. A. "Chaos and hyperchaos in a two-degree of freedom duffing oscillator". *Proceedings of the 26th International Congress of Mechanical Engineering*, 2021.

**Costa, L. G**; Reis, E. V. M.; Savi, M. A. "Energy Harvesting from Chaotic Vibration". *Proceedings of the 26th International Congress of Mechanical Engineering*, 2021.

2019

Borges, G. X. G.; **Costa, L. G**; Adeodato, A.; Duarte B. T.; Monteiro, L. L. S.; Pacheco, P. M. C. L.; Savi, M. A. "Nonlinear effects on experimental piezomagnetoelastic energy harvesting". *Proceedings of the 25th International Congress of Mechanical Engineering*, 2019.

**Costa, L. G**; Monteiro, L. L. S.; Savi, M. A. "A parametric analysis of the nonlinear dynamics of a duffing oscillator". *Proceedings of the 25th International Congress of Mechanical Engineering*, 2019.