


# César Herrera Garro

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## Education

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2022 – present  **Mathematics Ph.D. student, Purdue University**

2018 – 2022  **B.S. in Mathematics, Universidad de Costa Rica**

## Work Experience

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2022 (August)–present  **Teaching assistant, Purdue University**

- Analytic Geometry And Calculus II (MA 16600): Recitation Instructor
- Differential Equations And Partial Differential Equations For Engineering And The Sciences (MA 30300): Grader
- Elementary Linear Algebra (MA 35100): Grader
- Introduction To Discrete Mathematics (MA 37500): Grader
- Foundations of Analysis (MA 34100): Grader

2022 (March)– 2022 (August)  **Lecturer, Universidad de Costa Rica** Calculus II (MA 1002)


2019 – 2021  **Student Assistant, Universidad de Costa Rica**


- Graded and wrote assignments in Calculus and Linear Algebra
- Collaborated in math research projects
- Gave lectures in leveling workshops in mathematics

## Research

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### Journal Articles

1 J. C. Montesinos-López, M. L. Daza-Torres, Y. E. García, *et al.*, “Bayesian sequential approach to monitor covid-19 variants through test positivity rate from wastewater,” *mSystems*, vol. 0, no. 0, e00018–23,  DOI: 10.1128/msystems.00018–23. eprint: <https://journals.asm.org/doi/pdf/10.1128/msystems.00018–23>.

2 C. Herrera, R. Corrales-Barquero, J. Arroyo-Esquivel, and J. G. Calvo, “A numerical implementation for the high-order 2d virtual element method in matlab,” *Numer. Algorithms*, vol. 92, no. 3, pp. 1707–1721, Jul. 2022, ISSN: 1017-1398.  DOI: 10.1007/s11075-022-01361-4.

### Conference Proceedings

- 1 J. G. Calvo, C. Herrera, and F. A. Sequeira, "An overlapping preconditioner for 2d virtual problems posed in  $h(\text{rot})$  with irregular subdomains," in *Domain Decomposition Methods in Science and Engineering XXVII*, Z. Dostál, T. Kozubek, A. Klawonn, *et al.*, Eds., Cham: Springer Nature Switzerland, 2024, pp. 101–108, ISBN: 978-3-031-50769-4.



## Preprints

- 1 Z. Cai, A. Doktorova, R. D. Falgout, and C. Herrera, "Fast iterative solver for neural network method: I. 1d diffusion problems," in 2024. [URL: https://arxiv.org/abs/2404.17750](https://arxiv.org/abs/2404.17750).
- 2 M. L. Daza-Torres, J. C. Montesinos-López, C. Herrera, *et al.*, "Optimizing spatial distribution of wastewater-based disease surveillance to advance health equity," in Cold Spring Harbor Laboratory Press, 2024. [DOI: 10.1101/2024.05.02.24306777](https://doi.org/10.1101/2024.05.02.24306777). eprint: <https://www.medrxiv.org/content/early/2024/05/03/2024.05.02.24306777.full.pdf>.
- 3 A. Serracín-Morales, C. Herrera-Garro, and F. Sanchez, "Modeling the university drinking culture phenomenon," in 2022. [URL: https://hdl.handle.net/10669/87710](https://hdl.handle.net/10669/87710).




## To be submitted

- 1 Z. Cai, A. Doktorova, R. D. Falgout, and C. Herrera, *Fast iterative solver for neural network method:ii. 1d general elliptic problems and data fitting*.



## Skills

Languages  English, Spanish  
Coding  Java, Python, C, C++, Matlab,  $\text{\LaTeX}$

## Conferences & Workshops Attended

- May 2023  **Adaptive Methods and Model Reduction for PDEs** Research Summer School, University of Nottigham, Nottigham, England
- Oct 2023  **Fall 2023 Finite Element Circus**, University of Notre Dame, Notre Dame, Indiana, United States
- April 2024  **18th Copper Mountain Conference on Iterative Methods**, Copper Mountain, Colorado, United States

## Grants




- 2024  **Purdue Graduate Student Government Travel Grant**
-  **Purdue Graduate School Summer Research Grant**

## Programming and Mathematics Competitions

- 2021  **First place** The 2020 International Collegiate Programming Contest (ICPC) Central America Finals




## Programming and Mathematics Competitions (continued)

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- 2022  **ICPC World Finals Contestant** 45th ICPC World Finals, Dhaka
- 2021  **Bronze Medal** International Mathematics Competition for University Students
- 2020  **Honorable Mention** International Mathematics Competition for University Students

## Talks and Presentations

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- April 2022  Cálculo numérico de medidas de equilibrio utilizando un problema de Riemann-Hilbert, Universidad de Costa Rica
- April 2024  Fast Iterative Solver for Neural Network Method: II. 1D General Elliptic Problems and Data Fitting, Copper Mountain Conference On Iterative Methods
- May 2024  Fast Iterative Solver for Neural Network Method: I. 1D Diffusion Problems, Universidad de Costa Rica