

Lucas Machado Moschen

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A math student and aspiring scientist with a solid math background. I am interested in Optimal Control, Differential Equations, Probability and Statistics, with applications in Biology, such as Epidemiology, Public Health and Climate modelling.

EDUCATION

Ms.C. in Mathematical Modelling

Fundação Getulio Vargas, School of Applied Mathematics - Rio de Janeiro (Brazil)

2022 - 2023

- ❖ Advisor: Dr. Maria Soledad Aronna
- ❖ Academic grade: A in all courses
- ❖ Master's dissertation entitled "Optimal vaccination strategies for epidemics in metropolitan areas"

Bs.C. in Applied Mathematics

Fundação Getulio Vargas, School of Applied Mathematics- Rio de Janeiro (Brazil)

2018 - 2021

- ❖ Advisor: Dr. Luiz Max Carvalho
- ❖ Final grade: 9.65 (highest grade in my class)
- ❖ Bachelor Dissertation: Prevalence estimation and binary regression methods for respondent-driven sampling with outcome uncertainty

RESEARCH EXPERIENCE

Fundação Getulio Vargas, School of Applied Mathematics - Rio de Janeiro (Brazil)

2022 - 2023

- ❖ Paper production entitled "Bivariate beta distribution: parameter inference and diagnostics" with professor Dr. Luiz Max Carvalho
- ❖ Dissertation production with theme "Control in Complex Networks" with professor Dr. Maria Soledad Aronna

2020 - 2021

- ❖ Production of the published papers with professors Dr. Maria Soledad Aronna and Dr. Roberto Guglielmi

2019 - 2020

- ❖ Scientific Initiation with topic "Optimal Control in Biological Models"

National Institute for Pure and Applied Mathematics - Rio de Janeiro (Brazil)

2014 - 2017

- ❖ Junior Scientific Initiation Program in Mathematics

PUBLICATIONS

Aronna, Maria Soledad, Roberto Guglielmi, and Lucas Machado Moschen. "Estimate of the rate of unreported COVID-19 cases during the first outbreak in Rio de Janeiro." *Infectious Disease Modelling* 7.3 (2022): 317-332.

Aronna, M. Soledad, Roberto Guglielmi, and Lucas Machado Moschen. "A model for COVID-19 with isolation, quarantine and testing as control measures." *Epidemics* 34 (2021): 100437.

TEACHING EXPERIENCE

Fundação Getulio Vargas, School of Applied Mathematics - Rio de Janeiro (Brazil)

2019 - current

- ❖ Teaching assistant: Bs.C. Partial Differential Equations (2021, 2022), Ms.C.

Functional Analysis (2022), Ms.C. Statistical inference (2022), Ms.C. Bayesian Statistics (2022), Bs.C. Curves and Surfaces (2021, 2022), Bs.C. Introduction to Numerical Analysis (2021), Bs.C. Statistical inference (2020), Bs.C. Ordinary Differential Equations (2020) and Bs.C. Linear Algebra (2019)

Project Elos Educação - Rio de Janeiro (Brazil)
2019 - 2020

- ❖ Volunteer Algebra teacher to prepare students for high school exams

RELEVANT KNOWLEDGE

Programming skills in Python, R, Julia, C++, Matlab and JavaScripts

Programming tools Git, Visual Studio Code and Project Jupyter

RELATED ACTIVITIES

Imperial College London - London (United Kingdom)
2022

- ❖ Visiting student at the Department of Mathematics with supervisor Dante Kalise to work on Numerical Analysis and Optimal Control of Fokker-Planck equation.

National Institute for Pure and Applied Mathematics (IMPA) - Rio de Janeiro (Brazil)
Summer of 2020, 2021 and 2022

- ❖ Summer school at IMPA with mathematical courses at Master level.

HONORS & AWARDS

2023

Latin American Congress on Industrial and Applied Mathematics (LACIAM 2023)
Best poster presentation for the work on COVID-19 mathematical modelling

2022

Brazilian Society of Applied and Computational Mathematics (SBMAC)
Scientific Initiation Award SBMAC (3rd place) for my Bachelor Dissertation

2021

Fundação Getulio Vargas, School of Applied Mathematics
Academic Excellence with the highest final grade

REFERENCES

Maria Aronna Soledad
Fundação Getulio Vargas, School of Applied Mathematics - Rio de Janeiro (Brazil)
Associate Professor and Coordinator of the Undergraduate Program in Applied Mathematics
soledad.aronna@fgv.br

Roberto Guglielmi
University of Waterloo, Department of Applied Mathematics - Waterloo (Canada)
Assistant Professor
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Luiz Max Carvalho
Fundação Getulio Vargas, School of Applied Mathematics - Rio de Janeiro (Brazil)
Assistant teacher
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