Luan da Fonseca Santos

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Summary

I have a PhD degree in Applied Mathematics from the University of São Paulo. My primary research focus is on the development of numerical methods for geophysical fluid dynamics, with a particular emphasis on numerical weather/climate modeling, specifically the dynamical core development. I have experience in finite-volume/difference methods and locally refined grid generation.

Education

Institute of Mathematics and Statistics, University of São Paulo - USP São Paulo, SP, Brazil
Ph.D. Applied Mathematics *March 2020 - May 2024*

- Thesis title: Analysis of finite-volume advection schemes on cubed-sphere grids and an accurate alternative for divergent winds. Advisor: Dr. Pedro Peixoto.
- **2023/09**: Research visit to the AOS - Princeton University (hosts: Dr. Joseph Mouallem and Dr. Lucas Harris).

Institute of Mathematics and Statistics, University of São Paulo - USP São Paulo, SP, Brazil
M. Sc. Applied Mathematics *March 2018 - March 2020*

- Dissertation title: Analysis of mimetic finite volume schemes on classical and moist shallow water models considering topography based local refinement in spherical Voronoi grids. Advisor: Dr. Pedro Peixoto.

Institute of Mathematics and Statistics, University of São Paulo - USP São Paulo, SP, Brazil
B. Sc. Applied Mathematics (GPA: 9.3/10) *2014 - 2017*

- Project title: Local refinement and interpolation in spherical icosahedral grids. Advisor: Dr. Pedro Peixoto.
- Honorable mention for outstanding performance in the Applied Mathematics B.Sc. program.

Experience

Teaching Assistant 2017 – 2021
University of São Paulo *São Paulo, SP, Brazil*

- Grad courses:
  - 1^{st} sem/2019, 1^{st} sem/2020 and 1^{st} sem/2021 - MAP5729 - Introduction to Numerical Analysis (Institute of Mathematics and Statistics).
- Undergrad courses:
  - 2^{nd} sem/2019 - MAP2320 - Numerical methods in differential equations II (Institute of Mathematics and Statistics).
  - 2^{nd} sem/2018 - MAP0214 - Numerical Calculus with Applications to Physics (Institute of Astronomy, Geophysics and Atmospheric Sciences).
  - 1^{st} sem/2017 - MAC0427 - Non-linear Programming (Institute of Mathematics and Statistics).

Publication list

- Luan F Santos and Pedro S Peixoto (2021). **Topography based local spherical Voronoi grid refinement on classical and moist shallow-water finite volume models**, Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-14-6919-2021.

Talks

- **2023**: Enhancing accuracy of FV3 finite-volume operators at *FV3 group meeting, GFDL/NOAA, Princeton, USA.*
- **2021**: Topography based local spherical Voronoi grid refinement on classical and moist shallow-water finite volume models at *PDEs on the sphere 2021, Offenbach, Germany (online).*
- **2019**: Poster Presentation, Topography based local refinement in spherical Voronoi grids at *PDEs on the sphere 2019, Montréal, Québec, Canada.*

Participation at events

- **2021**: Participation in the ESCAPE2/Fondazione Alessandro Volta Summer school program - *Towards exascale computing for numerical weather prediction, Lake Como School of Advanced Studies (online).*
- **2019**: Participation in the *Winter School in Atmospheric Numerical Modeling at CPTEC (Center for Weather Forecasting and Climate Studies), Cachoeira Paulista, SP, Brazil.*

Grants

- Doctoral degree scholarship - São Paulo Research Foundation (FAPESP), grant 20/10280-4, 2020-2024.
- Master's degree scholarship - São Paulo Research Foundation (FAPESP), grant 17/25191-4, 2018-2020.
- Undergraduate research funding - São Paulo Research Foundation (FAPESP), grant 17/11542-0, 2017.

Links

- Personal webpage: https://luanfs.github.io/
- Google scholar: https://scholar.google.com/citations?user=lHQVgqgAAAAJ&hl
- ORCID: https://orcid.org/0000-0001-9084-6170

Technical Skills

- Programming languages: Fortran, Python (NumPy, SciPy, Matplotlib, Cartopy), C, and Matlab.
- Experience with parallel programming using OpenMP and MPI.
- General software and tools: Linux environment, Bash scripts, Git, remote servers, SSH, Tmux, Vim, LaTeX.

Additional Information

- Date of birth: August 07, 1993.
- Citizenship: Brazilian.
- Gender: Male.
- Marital status: Married.
- Languages: Portuguese (native) and English (advanced).