JOÃO VITOR DE O. SILVA

MSc in Computational Modeling

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PROFESSIONAL EXPERIENCE

Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Laboratory of Microhydrodynamics and Flow in Porous Media (LMMP) *Rio de Janeiro, RJ, Brazil*

Scientific Programmer/Researcher *September 2022 - Present*

- Participation in oil well simulation research project. Activities associated with this position include software development in C++, implementation of high-performance numerical solvers, and mathematical modeling.

Universidade Federal do Rio de Janeiro *Rio de Janeiro, RJ, Brazil*

Temporary University Lecturer (*Professor substituto*) *03/2020 - 03/2022*

Responsible for the following undergraduate courses:

- **Introduction to Programming (ICP114/ICP121, 4 hours per week)** in the semesters 2020-1, 2020-2 and 2021-2. This course presents the foundations of computer programming for the students who have no or very little programming knowledge and experience, using the Python 3 language. The topics include functions, variables, conditional statements (if/else), loops (for/while), data structures and modularization.
- **Computational Linear Algebra (ICP115, 6 hours per week)** in the semesters 2021-1 and 2021-2. This course is an introduction to linear algebra concepts such as linear combinations, subspaces, linear systems and eigenvalues, aimed for computer scientists. Part of the program is dedicated to the study of algorithms, as well as solving problems such as graphics animation with transformation matrices, least squares fitting and PageRank.
- **Computer Graphics I (ICP122, 4 hours per week)** in the semesters PLE (*Período letivo excepcional* - Exceptional remote semester), 2020-1, 2020-2 and 2021-1. This is a introductory course in computer graphics. The discussed topics include color theory, raster and vector graphics, 2D and 3D rendering, animation, 3D modeling, virtual cameras, texture mapping, lightning and image processing.

Also participated in the Computer Science curriculum reform discussions during the 2020 year.

Encontro Acadêmico de Modelagem Computacional XIV/XV *Petrópolis, RJ, Brazil*

Organizing Committee *February 2020 and February 2021*

- Responsible for inviting researchers for keynotes, as well as participating as chair of certain sessions.

International Mathematical Olympiad and International Mathematical Congress *Rio de Janeiro, RJ, Brazil*

Volunteer *July 2017 and August 2018*

- Helped the participants of both events to communicate with Brazilians. Also assisted the event's organizing committee on a number of situations.

EDUCATION

Laboratório Nacional de Computação Científica *Petrópolis, RJ, Brazil*

MSc in Scientific Computing *10/2018 - 08/2021*

- Master Thesis: Gaussian process modeling with applications to tumor growth.

Universidade Federal do Rio de Janeiro *Rio de Janeiro, RJ, Brazil*

Bsc in Computer Science *08/2013 - 08/2018*

- Bachelor Thesis: Generalized eigenvalue problems in linear hydrodynamic stability

ABOUT ME

Computer scientist, with experience in code development, teaching and research. Has interest in computer modeling, numerical and optimization algorithms, bayesian inference and metamodeling. More recently, has started to get involved with data science.

SKILLS

Python 3 • advanced
C/C++ • intermediate
Matlab • intermediate
Julia • intermediate
SQL • intermediate
Java • basic
HTML • basic
Javascript • basic
R • basic

LANGUAGES

Portuguese • native language
English • fluent
Spanish • basic

PUBLICATIONS

- Bayesian inference using Gaussian process surrogates in cancer modeling. *Computer Methods in Applied Mechanics and Engineering.*
- A generalised SEIRD model with implicit social distancing mechanism: A Bayesian approach for the identification of the spread of COVID-19 with applications in Brazil and Rio de Janeiro state. *Journal of Simulation.*
- Model Comparison and Uncertainty Quantification in Tumor Growth. *Trends in Computational and Applied Mathematics.*

HONORS

2019 **2nd Place,** *Prêmio Beatriz Neves - Sociedade Brasileira de Matemática Aplicada e Computacional* (undergraduate thesis national award)

EXAMINATION BOARDS

- Participation in undergraduate thesis examination board
  Student: Matheus Henrique Panno Guimarães
  Title: *Implementação Sequencial e Paralela das equações de Navier-Stokes usando C+CUDA*
  Examination board: Silvana Rosetto, Juliana Valério, Daniel A. Vigo, **João V. de O. Silva**
  Universidade Federal do Rio de Janeiro, 2022

EVENTS

- XXII ENMC - *Encontro Nacional de Modelagem Computacional, Juiz de Fora, Brazil, 2019.*
  Oral presentation: Bayesian Inference using Gaussian Process surrogates in cancer modeling.
- XXXIX CNMAC - *Congresso Nacional de Matemática Aplicada e Computacional, Uberlândia, Brazil, 2019.*
  Poster presentation: Use of surrogate models in tumor growth modeling.
- XXXVIII CNMAC - *Congresso Nacional de Matemática Aplicada e Computacional, Campinas, Brazil, 2018.*
  Poster presentation: Comparison of Discretization Methods in Linear Hydrodynamic Stability Problems.
- 22nd ILAS - conference of the International Linear Algebra Society, *Rio de Janeiro, 2019.*
  Congress participant.