Pedro Maciel Xavier

EDUCATION

Ph.D., Chemical Engineering Aug. 2024 - present
Purdue University *West Lafayette, IN*

M.Sc., Systems Engineering and Computer Science Jun. 2022 - present
PESC - COPPE/UFRJ - Optimization *Rio de Janeiro, RJ*
Advisors: Nelson Maculan & David E. Bernal Neira
GPA: 2.88 / 3

B.Sc., Computer and Information Engineering Apr. 2016 - Nov. 2022
Polytechnic School - POLI/UFRJ *Rio de Janeiro, RJ*
Thesis: SATyrus III: Generation of Computable Specifications
Advisor: Priscila Machado Vieira Lima
GPA: 7.9 / 10

B.Sc., Mathematics (*double major*) Jul. 2017 - Nov. 2020
Institute of Mathematics - IM/UFRJ *Rio de Janeiro, RJ*
GPA: 7.9 / 10

PROFESSIONAL EXPERIENCE

Research Intern Apr. 2024 - Jul. 2024
Microsoft Research — full-time *Cambridge, UK*
Analog Optimization ● Mathematical Programming ● *Open-source* Development

Researcher & Developer Mar. 2023 - Mar. 2024
PSR Energy — full-time *Rio de Janeiro, RJ*
Operations Research ● Stochastic Optimization ● Mathematical Modeling ● Software Engineering ● *Open-source* Development ● Quantum Optimization ● Innovation ● Power Systems Analysis

Visiting Scholar Aug. 2023 - Dec. 2023
Purdue University — full-time *West Lafayette, IN - USA*
Quantum Optimization ● Disjunctive Programming ● Mathematical Modeling ● *Open-source* Development ● Process Systems Engineering

Research & Development Intern Nov. 2021 - Feb. 2023
PSR Energy — part-time *Rio de Janeiro, RJ*

RESEARCH

Optimization & Quantum Computing Jan. 2020 - Aug. 2022
Final Project - LAM - PESC-COPPE/UFRJ *Rio de Janeiro, RJ*
Development of a SAT-like compiler for Quantum Optimization architectures.

Generative & Parametric Design Mar. 2020 - Jun. 2021
Undergraduate Research - LAMO - FAU/UFRJ *Rio de Janeiro, RJ*
Prepare course on Programming and Generative Design techniques for Architecture & Urbanism.

CONTACT

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⌂ pedromxavier
in pedro-maciel-xavier
🔗 pedro.ελ

LANGUAGES

🇧🇷 Native
🇬🇧 Fluent
🇪🇸 Intermediate
🇩🇪 Basic

TOOLS

↪ Julia
↪ Python
↪ Fortran
↪ C/C++
↪ Git
↪ $\TeX$, $\LaTeX$
↪ Rhinoceros
↪ AutoCAD
↪ Revit

LATEST

| **Weightless Neural Networks** | Jan. 2019 - Dec. 2019 |
| *Undergraduate Research - LAM - PESC-COPPE/UFRJ* | *Rio de Janeiro, RJ* |

Development of nonlinear encoding schemes for applications in High Energy Physics (HEP).

| **Weightless Neural Networks** | Jan. 2017 - Dec. 2018 |
| *Undergraduate Research - NCE/UFRJ* | *Rio de Janeiro, RJ* |

| **CAPES program against Zika Virus** | Jul. 2017 - Jun 2018 |
| *Undergraduate Research - IFF/FIOCRUZ* | *Rio de Janeiro, RJ* |

Developed clinical research forms and electronic medical record system with SQL database and Web interface.

PUBLICATIONS

QUBO.jl: A Julia Ecosystem for Quadratic Unconstrained Binary Optimization

arXiv preprint

Research Article   2023

Computation for Architecture, hybrid visual and textual language: Research developments and considerations about the implementation of structural imperative and object-oriented paradigms

International Journal of Architectural Computing (IJAC)

Research Article   2022

Detection of elementary particles with the WiSARD n-tuple classifier

28th European Symposium on Artificial Neural Networks (ESANN)

Conference   Bruges, Belgium   Oct. 2 - 4, 2020

EVENTS

CQ&OR22 — Workshop on Quantum Computing and Operations Research

Fields Institute

Presentation   Toronto, ON   13 - 14 Oct. 2022
  ↪ JuMP To QUBO Automatic Reformulation

XXV SIGraDi International Conference 2021

Sociedade Ibero-Americana de Gráfica Digital

Presentation   8 - 12 Nov. 2021
  ↪ Designing Learning Methods: Programming with Visual and Textual Language in Python

AcademyHack Ambev

Ambev Tech, AB Inbev

Hackathon   Nov. 2021
  ↪ Ambev Ambassador, participant in a series of mentorships in communication and leadership.
  ↪ Student responsible for interaction with the university and advisor to one of the winning teams.

JICTAC UFRJ 2020

Federal University of Rio de Janeiro

Presentation   Rio de Janeiro, RJ   2020

- ↪ *Best work:* Elementary particle detection with Weightless Neural Networks.
- ↪ Content development for programming course applied to Architecture.

Vacathon Ideas for Milk 2019

EMBRAPA Dairy Cattle

Hackathon   Juiz de Fora, MG   28 Oct. - 1 Nov. 2019

- ↪ UFRJ representative in the competition.

JICTAC UFRJ 2018

Federal University of Rio de Janeiro

Presentation   Rio de Janeiro, RJ   2018

- ↪ *Honorable Mention:* The Neural Model without WiSARD weights in the classification of elementary particles.
- ↪ *Honorable Mention:* Reducing Inequalities with training workshops for the Brazilian Mathematics Olympiad for Public Schools.

LNCC Summer Program 2018

National Laboratory of Scientific Computing (LNCC)

Mini-courses   Petrópolis, RJ   5 - 8 Mar. 2018

- ↪ Data Analysis
- ↪ Oncoimmunology
- ↪ Modeling of Biological Systems
- ↪ Computational Fluid Animation

TEACHING
TA

Graduate courses   2020-2022   Rio de Janeiro, RJ

- ↪ Optimization for Data Science (lato sensu)   IM/UFRJ
- ↪ Weightless Neural Networks   PESC - COPPE/UFRJ
- ↪ Computer Graphics   PESC - COPPE/UFRJ

TA

Undergraduate courses   2018-2021   Rio de Janeiro, RJ

- ↪ Mathematical Optimization   POLI/UFRJ
- ↪ Computer Graphics   POLI/UFRJ
- ↪ Data Structures   POLI/UFRJ
- ↪ Programming for Architecture   FAU/UFRJ
- ↪ Calculus   IM/UFRJ
- ↪ Programming Languages   POLI/UFRJ
- ↪ Programming II   POLI/UFRJ
- ↪ Programming I   POLI/UFRJ