

José Carlos Fontanesi Kling

PhD in Applied Mathematics with solid academic background from the [University of São Paulo \(USP\)](#) and [Kiel University \(CAU\)](#), combined with programming knowledge and interest from logical and mathematical problems.

Having worked as a researcher at [GEOMAR Helmholtz Centre for Ocean Research Kiel](#) granted me the ability to work in highly interdisciplinary and international environments, in addition to capacity to communicate complex concepts both orally and in writing.

EXPERIENCE

May 2025 – Jul 2025 Researcher in Applied Mathematics
[GEOMAR](#)

Layers of volcanic ash can be found on land or in sediments collected from the ocean floor. It is usually possible to determine the source of a volcanic layer found on land. In marine sediments, however, it is common for several volcanoes to be nearby, making it difficult to determine their source.

The goal of this project is to use geochemical composition data from various volcanic layers whose volcano responsible for the eruption is known as ground truth for the classification of layers found in marine sediments. The k-nearest neighbors algorithm was used as a benchmark, and the final model is a combined model composed of a neural network and a random forest.

The results were used in the article *Facies characterization and volcanic source assignment of marine tephra deposits around São Miguel Island, Azores Archipelago*, currently under review in the journal [G³](#)

Nov 2021 – Apr 2025 PhD research in Applied Mathematics
[GEOMAR/Kiel University](#)

Tesis: [New statistical techniques for the analysis of eruption data](#)

This project, part of the [MarDATA School for Marine Data Science](#), aimed to develop rigorous statistical procedures to evaluate the relationship between historical climate data and the occurrence of volcanic eruptions.

The problem was mathematically formalized using the concept of point processes, treating volcanic eruptions as random events within a predetermined time interval, while historical temperatures are external factors that may influence the rate at which eruptions occur.

Several models for this influence were developed and tested with simulation-based procedures. This methodology was introduced in the article [On goodness-of-fit testing for self-exciting point processes](#) and used in the analysis of the eruption history of the Izu–Bonin arc (to be published).

All procedures developed in this research are open source and available in [PointProcessTools.jl](#), implemented in the [Julia](#) programming language. This package is being improved together with other researchers and will be released as an official package ([PointProcesses.jl](#)).

EDUCATION

2021 – 2025 PhD in Applied Mathematics
[Christian-Albrechts-Universität zu Kiel \(CAU\)](#)

2018 – 2020 Master of Science in Mathematics
[ICMC, Universidade de São Paulo](#)
[Applications of ultrafilters to ergodic Ramsey theory](#)
FAPESP Scholarship

2014 – 2017 Bachelor of Science in Mathematics
[ICMC, Universidade de São Paulo](#)
2015 – 2017 FAPESP scientific initiation scholarship

PERSONAL INFORMATION

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🔊: JoseKling
in: José Kling
🏠: Hamburg, Germany

SKILLS

- Mathematics
 - Statistics
 - Machine Learning
 - Set Theory
 - Topology
- Problem solving
- Scientific writing and presentation
- Programming
 - Julia, Python, MATLAB
 - SQL
 - Git, GitHub
 - Linux, Bash
 - Docker
 - LaTeX
- Microsoft office
 - Word
 - Excel
 - PowerPoint

LANGUAGES

Portuguese	Native
English	Proficient
Spanish	Advanced
German	Advanced
Italian	Intermediate

PROJECTS / LEARNING

- [PointProcesses.jl](#)
Simulation and inference for Point Processes.
- [TPP notebooks](#)
Interactive Notebooks for the analysis of Point Processes.
- [HTTP Server](#)
Simple HTTP server for plain text and JSON APIs.
- [IQSolver](#)
Algorithm for solving the game IQ Puzzler Pro.
- [Neural Network](#)
Simple Neural Network using only the numpy library.
- [Sudoku Solver](#)
Reads and solves a sudoku board from an image using Crook's algorithm.

PUBLICATIONS

On goodness-of-fit testing for self-exciting point processes	2025	Kling , Vetter
PointProcessTools. jl (software)	2024	Kling , Vetter, Schindlbeck-Belo, Jegen, Kutterolf
Timing and Recurrence Intervals for Major Eruptions from AMATITLÁN Caldera (guatemala)	2022	Cisneros, Danisik, Schindlbeck-Belo, Kutterolf, Schmitt, Freundt, Kling , Wang, Lee
Variations in event-bed thickness-frequency distributions near volcanic islands: Indicators of varied geological processes	2025	Chang, Kling , Schindlbeck-Belo, Mitchell, Hsiung, Kanamatsu

PRESENTATIONS

A new test for the analysis of volcanic activity over time	2023	AGU Conference, San Francisco, EUA
A New Statistical Test for Volcanic Activity Variability on a 1.1 Myr Tephra from the NW Pacific	2023	INQUA, Rome, Italy
New statistical test for the relation between climate and volcanism	2023	Physics of Volcanoes, Oberpfaffenhofen, Germany
A topological game on the space of ultrafilters	2018	Winter School of Mathematics, Hejnice, Czech Republic

TEACHING

- 2016** Introduction to Game Theory (16 hours) - ICMC (USP)
- 2015** Mini-course on Topology (16 hours) - ICMC (USP)

AWARDS

- 2014/2015/2016/2017** Academic highlight - Best grades in class