# Sebastián REYES RIFFO

chilean, 34 years old
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## Research Interests

I am attracted by the opportunity to work in a multidisciplinary team, on problems related with mathematical modeling, control theory, numerical analysis and domain decomposition methods.

## Professional Experience

10.2020 - 09.2021 **Postdoctoral researcher.** WIND Project, Géoazur, CNRS.
- Development of a Schwarz preconditioner for solving a finite-difference discretization of the Helmholtz Equation.
- Implementation of an interface between Fortran codes and PETSc.

02.2016 - 11.2019 **PhD student.** CEREMADE, Université Paris Dauphine-PSL.
- Development of a procedure for coupling unbounded in time data assimilation methods with time-parallel algorithms. Performance study.
- Convergence analysis of an algorithm for blade construction.
- Optimization of a tidal turbine propeller.
- Modeling of a bathymetry determination problem.
- Development of a theoretical framework for the problems mentioned above.

05.2015 - 09.2015 **Research Internship.** Team ANGE, INRIA Paris.
- Development of an algorithm for bathymetry determination.
- Convergence analysis of the associated numerical solver.

04.2014 - 08.2014 **Research Assistant.** ISCI, Universidad de Chile.
- Study of pattern formation related to criminal activity.

06.2011 - 10.2013 **Research Assistant.** CEAMOS, Universidad de Chile.
- Mathematical modeling of criminal activity.
- Theoretical analysis and numerical simulation of bifurcation branches.

## Education

2019 **PhD in Applied Mathematics.** Université Paris Dauphine-PSL.
*Mathematical methods for marine energy extraction*.
Thesis directed by Julien Salomon.

2015 **Master 2 in Applied Mathematics.** Université Paris Dauphine-PSL.

2013 **Mathematical Engineering.** Universidad de Chile.

2012 **Bachelor of Sciences. Major in Mathematics.** Universidad de Chile.

Languages Spanish (Native), English (fluent), French (fluent).

Computer Skills LaTeX, Matlab, FreeFem++, Fortran, Python, C++.

## Conferences

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| 07-12.12.2020 | *Time-parallelization of sequential data assimilation problems.*<br>26th International Conference on Domain Decomposition Methods (DD26).<br>Chinese University of Hong Kong, Hong Kong, China. |
| 10-11.12.2020 | 12th Conference FreeFEM Days.<br>Laboratoire Jacques-Louis Lions (LJLL), Paris, France. |
| 02-04.07.2019 | 2nd Conference on Simulation and Optimization for Renewable Marine Energies (EMRSIM19).<br>Roscoff Marine Station, Roscoff, France. |
| 02-05.09.2018 | 7th Workshop on Parallel-in-Time Methods (PinT18).<br>Roscoff Marine Station, Roscoff, France. |
| 06-10.02.2017 | 24th International Conference on Domain Decomposition Methods (DD24).<br>University of Bergen, Longyearbyen, Norway. |
| 27-29.03.2014 | 3rd French-Chilean Workshop on Bioprocess Modeling.<br>Universidad Técnica Federico Santa María, Valparaíso, Chile. |

## Seminars

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| 23.06.2016 | *Mathematical methods for marine energy extraction.*<br>Team ANGE, INRIA Paris, France. |

## Research Visits

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| 11.2017 | Visit to the Department of Mathematics of HKBU, Hong Kong, China, for a collaboration with Felix Kwok. |
| 10.2016 | Visit to the Department of Mathematics of HKBU, Hong Kong, China, for a collaboration with Felix Kwok. |

## Publications


[1] P.-H. Cocquet, S. Riffo, J. Salomon. *Optimization of bathymetry for long waves with small amplitude*. SIAM J. Control Optim., 59(6), pp. 4429–4456, 2021.

[2] J. Ledoux, S. Riffo, J. Salomon. *Analysis of the Blade Element Momentum Theory*. SIAM J. Appl. Math., 81(6), pp. 2596–2621, 2021.

[3] P.-H. Tournier, P. Jolivet, V. Dolean, H. Aghamiry, S. Operto and S. Riffo. *Three-dimensional finite-difference & finite-element frequency-domain wave simulation with multi-level optimized additive Schwarz domain-decomposition preconditioner: A tool for FWI of sparse node datasets*. Submitted (2020).

[4] F. Kwok, S. Riffo, J. Salomon. *Time-parallelization of sequential data assimilation problems*. Available upon request.

## Teaching Experience

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| 2017 - 2019 | **Assistant Teacher** (∼60h). MIDO, Université Paris Dauphine-PSL.<br>◦ Complex Analysis.<br>◦ Linear Algebra 3. |
| 01.2018 | **Lecturer**. EdV, Universidad de Chile.<br>◦ An introduction to Abstract Algebra. |
| 2011 - 2013 | **Coordinator.** EdV, Universidad de Chile.<br>◦ Leading a team of assistant teachers (between eight and fourteen, depending on the year) and be in charge of all aspects of different mathematics courses, which together had approximately four hundred high school students. |
| 2008 - 2013 | **Assistant Teacher** (∼160h). DIM, Universidad de Chile.<br>◦ Probability and Statistics.<br>◦ Introduction to Partial Differential Equations.<br>◦ Ordinary Differential Equations.<br>◦ Algebra 1.<br>◦ Linear Algebra.<br>◦ Single Variable Calculus. |

## Awards

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| 2015 | Doctoral contract granted by École Doctorale de Dauphine. |
| 2014 | Master scholarship granted by Fondation Sciences Mathématiques de Paris. |
| 2006 | Excellence scholarship granted by Universidad de Chile. |