Cristian Andrés Inzunza Domínguez

Personal Information

Nationality:	Chilean
Date of Birth:	October 7, 1992
Marital Status:	Married
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Education

2020- 2024 University of Concepción, Chile
Ph.D. in Applied Sciences with mention in Mathematical Engineering

2011- 2018 University of Concepción, Chile
Mathematical Civil Engineer

Work Experience

2024-Current | **Part-Time Professor**, Universidad Católica de la Santísima Concepción, Concepción, Chile.

- *Algebra and Linear Algebra*
- *Calculus*
- *Multivariable Calculus*
- *Differential equations*
- *Numerical Calculus*

2019 | **Research Assistant**, Center for Research in Mathematical Engineering, Udec, Concepción, Chile.

2018 | **Internship**, Department of Physics, Faculty of Physical and Mathematical Sciences, Udec, Concepción, Chile.

Matlab programming of optimization algorithms applied to quantum tomography problems.

2013-2018 | **Teaching Assistant**, Faculty of Physical and Mathematical Sciences, Udec, Concepción, Chile.

Tutoring for students in the following courses:

- *Numerical Calculus*
- *Linear Algebra*
- *Algebra and Trigonometry*
- *Introduction to University Mathematics*
- *Calculus*
- *Numerical Methods*

Thesis

2024-Grad.	Banach spaces-based mixed finite element methods for coupled diffusion problems and related models. Adv. G.N. Gatica.
2018-Under.	An augmented fully-mixed finite element method for a coupled flow-transport problem. Adv. G.N. Gatica.

Scholarships

2020-2024 National Doctoral Scholarship, Academic Year 2020, ANID (Chile).

Research Interests

Numerical analysis, finite element methods, mixed finite element methods, coupled and nonlinear PDE problems.

References

Gabriel N. Gatica	Full Professor Universidad de Concepción Email: ggatica@ci2ma.udec.cl
Nilima Nigam	Professor Simon Fraser University Email: nigam@math.sfu.ca
Ricardo Ruiz-Baier	Professor School of Mathematics, Monash University Email: ricardo.ruizbaier@monash.edu

Highlight Conferences

2024-Jan.	**Workshop on Numerical Analysis for PDE 2024** Fully mixed methods for the coupled poroelasticity and Poisson–Nernst–Planck equations.
2023-Dec.	**The 67th Annual Meeting of the Australian Mathematical Society 2023** A Banach spaces-based fully-mixed finite element method for the coupled poroelasticity and Poisson–Nernst–Planck equations.

Publications

Submitted Preprints

- G.N. Gatica, C. Inzunza, and R. Ruiz-Baier, *Primal-mixed finite element methods for the coupled Biot and Poisson-Nernst-Planck equations*. Preprint, Centro de Investigación en Ingeniería Matemática (CI^{2}MA), Universidad de Concepción, (2024).

In press (accepted for publication)

- J. Careaga, G.N. Gatica, C. Inzunza, and R. Ruiz-Baier, *New Banach spaces-based mixed finite element methods for the coupled poroelasticity and heat equations*. IMA Journal of Numerical Analysis, (2024).

Published

- G.N. Gatica, C. Inzunza and F.A. Sequeira, *New Banach spaces-based fully-mixed finite element methods for pseudostress-assisted diffusion problems*. Applied Numerical Mathematics, vol. 193, pp. 148-178, (2023).
- S. Caucao, E. Colmenares, G.N. Gatica and C. Inzunza, *A Banach spaces-based fully-mixed finite element method for the stationary chemotaxis-Navier-Stokes problem*. Computers & Mathematics with Applications, vol. 145, pp. 65-89, (2023).
- G N. Gatica, C. Inzunza and F.A. Sequeira, *A pseudostress-based mixed-primal finite element method for stress-assisted diffusion problems in Banach spaces*. Journal of Scientific Computing, vol. 92, 3, article: 103, (2022).
- G.N. Gatica, C. Inzunza, R. Ruiz-Baier and F. Sandoval, *A posteriori error analysis of Banach spaces-based fully-mixed finite element methods for Boussinesq-type models*. Journal of Numerical Mathematics, vol. 30, 4, pp. 325-356, (2022).
- G.N. Gatica and C. Inzunza, *On the well-posedness of Banach spaces-based mixed formulations for the nearly incompressible Navier-Lame and Stokes equations*.. Computers & Mathematics with Applications, vol. 102, pp. 87-94, (2021).
- G.N. Gatica and C. Inzunza, *An augmented fully-mixed finite element method for a coupled flow-transport problem*. Calcolo, vol. 57, 1, article:8, (2020).

Research Visits

2023	**Research Internship**, School of Mathematics, Monash University, Australia. Adv. Ricardo Ruiz-Baier. contact: ricardo.ruizbaier@monash.edu.
2019	**Research Internship**, Department of Mathematics, Simon Fraser University, Burnaby B.C. Canada. Adv. Nilima Nigam. contact: nigam@math.sfu.ca.

Programming Languages

Advanced Proficiency: LaTeX- Matlab - FreeFem++ - FEniCS