MARTÍN HERNÁNDEZ SALINAS

Mathematical Engineer and M.Sc. in Mathematics (Technical University Federico Santa María, Chile). Currently a Ph.D. student at Friedrich-Alexander-Universität Erlangen–Nürnberg, Germany. Independent researcher with strong analytical skills for solving and analyzing mathematics-related problems.

CONTACT

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- @Martinshs
- Martín Hernández

SKILLS

Programming

Python
MATLAB
C
Office
LaTeX
Tableau
ACL

Python libraries

Visualization
(Matplotlib, Altair)
Data Analysis
(Pandas, Spark)
Mathematics
(Numpy, Gekko, Scipy, Fenics/Dolfin)
Machine Learning
(Pytorch, Tensorflow, sklearn, scikit-learn)

Languages

Spanish
English
Portuguese

RESEARCH INTERESTS

- Control Theory
- Partial Differential Equations
- Numerical Analysis
- Deep learning
- Machine learning
- Efficient algorithms
- Optimization

EDUCATION

09/2021 - 09/2025
Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
Dr. rer. nat. Student

03/2019 - 03/2021
Technical University Federico Santa María, Valparaiso
M.Sc. in Mathematics

03/2015 - 03/2021
Technical University Federico Santa María, Valparaiso
Mathematical Engineer

HONORS & AWARDS

- (2016 - 2021) Honor roll member of the Technical University Federico Santa María. Student belonged to the USM Honor Roll, whose members, by academic performance, are located within the top 10% of students taking subjects
- Mathematical Engineering degree with Highest Distinction (Maximum score in defense of thesis).
- M.S. degree with Highest Distinction (Maximum score in defense of thesis).

TEACHING EXPERIENCE

03/2018 - 12/2020
UTFSM, Valparaiso
Exercise Teacher
Exercise teacher for eight courses related with differential and integral Calculus, and ordinary and partial differential equations.

03/2021 - 12/2021
UTFSM, Valparaiso
Part-Time Teacher
Lecturing at the Mathematics Department.

05/2024
ML&OC24, Italy
Summer School
Summer school in the ML&OC 24: Machine Learning and Optimal Control.

06/2024
EECI-IGSC M18, Croatia
Summer School
Summer school in EECI-IGSC 2024: Control and Machine Learning.

01/2025
UFF, Brazil
Summer School
Summer school at UFF, Introduction to turnpike phenomenon

PROFESSIONAL EXPERIENCE

12/2022 - 06/2025
TRR154 subproject C07, Germany.
Associated Ph.D. student
Analysis of gas transport models, numerical implementations and random domain decomposition.

02/2021 - 02/2022
Deloitte Spa. Santiago
Analyst in Financial Risk
Specialist in financial risk models, statistical models and programming.

FUNDING

2019-2021	Scholarship. Dirección de Postgrados y Programas (DPP) of the U. Técnica Federico Santa María.
2021-2022	Scholarship. Deutsche Forschungsgemeinschaft within Project ID 239904186 – TRR 154 Mathematical modeling, simulation and optimization using the example of gas networks.
2022-2026	Scholarship. Acuerdo Bilateral en el Extranjero ANID-DAAD.
2022-2026	SFB Transregio 154 Mathematische Modellierung, Simulation und Optimierung am Beispiel von Gasnetzwerken.
2023-2025	DAAD/CAPES Programs for Project-Related Personal, grant 57703041, Name: 'Control and numerical analysis of complex systems'.

ACTIVITIES

• 04/2025	Attendance at Machine Learning and PDEs Workshop, Germany.
• 01/2025	Talk at Technical University of Darmstadt, and visit to Prof. Jan Giesselmann.
• 01/2025	Lecturing at Universidad Federal Fluminense, Brazil, and visiting Prof. Juan Límaco.
• 12/2024	Talk at Humboldt University of Berlin, and visit to Prof. Falk Hante.
• 11/2024	Attendance at Oberwolfach Seminar: Control and Machine Learning, Germany.
• 26/08/2024	Talk at X Partial differential equations, optimal design and numerics, Benasque, Spain.
• 23/08/2024	Talk at X Partial differential equations, optimal design and numerics, Benasque, Spain.
• 19/08/2024	Talk at X Partial differential equations, optimal design and numerics, Benasque, Spain.
• 06/2024	Lecturer at EECI-IGSC 2024: Control and Machine Learning (M18), Dubrovnik, Croatia.
• 05/2024	Lecturer at the ML&OC24: Machine Learning and Optimal Control summer school, Gaeta, Italy.
• 11/2023	Attendance at the Workshop: Scientific Writing, Darmstadt, Germany.
• 11/2023	Visit to Professor M. Lazar for a week at the University of Dubrovnik, Croatia.
• 10/2023	Visit to the University of Deusto in Spain for a week together with Prof. Falk Hante from the Humboldt-Universität zu Berlin.
• 08/2023	Talk at the 10th International Congress on Industrial and Applied Mathematics (ICIAM), Tokyo.
• 02/06/2023	Talk at the 93rd Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM), Germany.
• 01/06/2023	Talk at the 93rd Annual Meeting of the International Association of Applied Mathematics and Mechanics (GAMM), Germany.
• 05/2023	Talk at the "Orientierungswoche" for first-year students of the Data Science Department at FAU, Germany.
• 11/2022	Attendance at the workshop in Good Scientific Practice, Bamberg, Germany.
• 09/2022	Talk at the 25th International Symposium on Mathematical Theory of Networks and Systems, Germany.
• 08/2022	Talk at the IX Partial differential equations, optimal design, and numerics, Spain.
• 08/2022	Talk at the IX Partial differential equations, optimal design, and numerics, Spain.
• 04/2022	Talk at South Zone Mathematics Conference, Chile.
• 01/2022	Attendance at the workshop of the annual scientific event AIMS-Cameroon Mathematics and its Applications Meeting (ACMAM).
• 01/2022	Attendance at rhetoric workshop Online (second part). Funded by the TRR154 project.
• 11/2021	Workshop on Non-Linear Analysis and Control Theory in honor of Prof. Enrique Zuazua, Universidad de Chile, Chile.
• 10/2021	Attendance at rhetoric workshop, Berlin, Germany. Funded by the TRR154 project.
• 09/2021	Attendance at the workshop Deep Learning with MATLAB, for GMU CMAI and FAU MOD by the MathWorks.
• 04/2021	Attendance at South Zone Mathematics Conference, Chile.
• 04/2021	Deep Learning online course at Coursera.
• 10/2020	Attendance at doctorate school, UC, Chile.
• 08/2020	Attendance at the online course of introduction to moments method for Control of PDEs, UFPB.
• 2019-2020	Member of the student council of Sciences, an organization that groups five careers of the Technical University Federico Santa María, which is in charge of the student representation.
• 2016-2019	Attendance at the National Encounter of Mathematical Civil Engineers, Chile.
• 03/2019	Attendance at the workshop of scientific diffusion and communication, UTFSM, Chile.
• 01-03/2018	Attendance at the summer school at Instituto de matemática pura e aplicada (IMPA).

PUBLICATIONS

Averaged Turnpike Property for Differential Equations with Random Constant Coefficients

Martín Hernández, Rodrigo Lecaros, and Sebastián Zamorano

2023 *Mathematical Control and Related Fields*, **13**(2), 808–832

DOI:10.3934/mcrf.2022016

Uniform Turnpike Property and Singular Limits

Martín Hernández and Enrique Zuazua

2024 *Acta Applicandae Mathematicae*, **190**, Paper No. 3, 33 pp.

DOI:10.1007/s10440-024-00640-7

Mini-batch Descent in Semiflows

Alberto Domínguez Corella and Martín Hernández

2025 *ESAIM: Control, Optimisation and Calculus of Variations*, **31**, Article 28

DOI:10.1051/cocv/2025018

PREPRINTS

Averaged observations and turnpike phenomenon for parameter-dependent systems

Martín Hernández, Martin Lazar, Sebastián Zamorano.

2024 Preprint

arXiv:2404.17455

Constructive Universal Approximation and Finite Sample Memorization by Narrow Deep ReLU Networks.

Martín Hernández and Enrique Zuazua.

2024 Preprint

arXiv:2409.06555

Random Batch Methods for PDE control on graphs.

Martín Hernández and Enrique Zuazua.

2025 Preprint

arXiv:2506.11809

IN PREPARATION

Random domain decomposition for parabolic PDEs.

Martín Hernández.

2025 Preprint

A mathematical framework for dropout in neural ODEs via random batch methods.

Martín Hernández and Antonio Álvarez-López.

2025 Preprint