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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- 📍 Erlangen, Germany
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- ⌨ @Martinshs
- in 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 - Actual
📍 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 for eight courses related with differential and integral Calculus, and ordinary and partial differential equations.
Exercise Teacher

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

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

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

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

⚙ PROFESSIONAL EXPERIENCE

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

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

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

Uniform Turnpike Property and Singular Limits

Martín Hernández and Enrique Zuazua

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

Mini-batch Descent in Semiflows

Alberto Domínguez Corella and **Martín Hernández**

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

PREPRINTS

Averaged observations and turnpike phenomenon for parameter-dependent systems

Martín Hernández, Martin Lazar, Sebastián Zamorano.

2024   Preprint

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

Martín Hernández and Enrique Zuazua.

2024   Preprint

Random Batch Methods for PDE control on graphs.

Martín Hernández and Enrique Zuazua.

2025   Preprint

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