

# Diego Renner

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 [DiegoRenner](#)

</> C++, Python, Rust

Date of Birth: 29.08.1995

Nationality: Swiss

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*(Items relating to projects and papers are clickable.)*



## EDUCATION

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- **Imperial College London**

*M.Sc. Mathematics*

London, England

*May 2025 - now*

- Development of GPU Compressible Flow Solver for Turbomachinery (C++).

- **ETH Zurich**

*M.Sc. Mathematics*

Zurich, Switzerland

*September 2021 - December 2023*

- Degree completed with a thesis on differentiable haemodynamics solver in JAX (Python).

- **ETH Zurich**

*M.Sc. Computational Science and Engineering, Specialization Physics*

Zurich, Switzerland

*September 2018 - August 2021*

- Degree completed with a thesis on solving the transmission scattering problem using BEM (C++).

- **Universität Basel**

*B.Sc. Computational Mathematics*

Basel, Switzerland

*September 2014 - December 2017*

- Completed extracurricular courses on Computer Architecture, Operating Systems and Quantum Mechanics.

- **Gymnasium Bäumlihof**

*Matura, Specialization Biology & Chemistry*

Basel, Switzerland

*August 2009 - July 2014*

## PROJECTS & THESIS

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- Parallelizing the Barnes-Hut Algorithm with MPI: Parallelized implementation of N-Body solver in C++ using the MPI framework. (Course Work)
- AiiDA Lab implementation of IR spectrum calculations for carbon based nanomaterials: An AiiDa workflow implemented in the Jupyter Notebooks based AiiDa lab interface. (Semesters Thesis, Computational Science)
- Near Resonances for Scattering Transmission Problems: A BEM based C++ solver for Scattering Transmission Problems, developed to investigate scatterer-dependent near resonances. (Master's Thesis, Computational Science)
- ML Based Game Simulation in a Finance Setting: Agents trained to trade or hold a stock taking into account real historical data on cash returns. Policies are learned via reinforcement learning. (Course Work)

- On differentiable simulations of haemodynamic systems: A 1D-haemodynamics solver written in Python using JAX. The differentiability of the solver aims to aid in the development of personalised medicine. (Master's Thesis, Mathematics)

## PUBLICATIONS

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- Detecting Near Resonances in Acoustic Scattering: Continued development of root finding algorithm from Master's Thesis using handcrafted optimization algorithm and state of the art computation of singular values. (Published)
- Accelerated Patient-Specific Calibration via Differentiable Haemodynamics Simulations: Demonstrating feasibility of parameter inference through differentiable 1D-haemodynamics solver written in Master's Thesis. (Preprint)
- Raman spectroscopy enabled automatic media release controlled by convolutional neural networks. (Work in Progress)

## EXPERIENCE

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- Novartis Pharma AG** Basel, Switzerland  
June 2024 - December 2024  
*MSc Student Proc Dev & New Technologies*
  - Developing ML/AI algorithms for classifying Raman spectroscopy data.**Technologies:** imbalanced-learn, JAX, Matplotlib, NumPy, scikit-learn, SciPy, TensorFlow  
**Theory:** (C)NN, DoE, GMM, PCA, SMOTE
- plantime** Basel, Switzerland  
January 2024 - April 2025  
*Software Engineer*
  - Developing ML/AI algorithms for optimizing shift scheduling.**Technologies:** Rust  
**Theory:** Evolutionary optimization algorithms
- ETH Zurich** Zurich, Switzerland  
September 2021 - February 2022  
*Teaching Assistant*
  - Teaching Assistant for Lecture "Numerical Methods for Computer Science".**Technologies:** C++  
**Theory:** ODEs, PDEs and numerical algorithms to solve them
- ETH Zurich** Zurich, Switzerland  
September 2020 - June 2021  
*Research Assistant*
  - Hired for continued development of BEM code that was implemented in Master's Thesis.**Technologies:** C++, CMake, Git  
**Theory:** BEM, Resonances in Transmission Scattering Problems
- ETH Zurich** Zurich, Switzerland  
September 2020 - February 2021  
*Teaching Assistant*
  - Teaching Assistant for Lecture "Numerical Methods".**Technologies:** C++, CMake  
**Theory:** ODEs, PDEs and numerical algorithms to solve them
- CSCS Swiss National Supercomputing Center** Lugano, Switzerland  
May 2018 - August 2018  
*Internship*
  - Writing regression checks for Piz Daint, Cray XC40/XC50 production system.**Technologies:** C, MPI, MySQL, Kibana, Grafana

## CERTIFICATES & EXTRACURRICULARS

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- **Ready, set, go! A short introduction for Student Teaching Assistants** (remote) Zurich  
*Education Development and Technology, ETH Zurich* April 2020
  - Improving didactic skills
  - Setting goals for upcoming teaching activity
- **Effective High-Performance Computing & Data Analytics with GPU** (remote) Lugano, Switzerland  
*Summerschool, CSCS-USI* July 2020
  - GPU: architecture & programming (CUDA, OpenACC)
  - JupyterLab
  - Python: Numpy, SciPy, Dask, Numba
  - ML: Rapids
  - Deep Learning: TensorFlow
- **International Consulting Network (ICON)** Shanghai, (remote) Belo Horizonte  
*Student Consulting Network* March 2017 - February 2018
  - Market Research & Trend Analysis consulting for CREP (Real Estate, China) & Lalubema (Private Security, Brazil)

## VOLUNTEERING

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- **Mapathon@Novartis with the Swiss Red Cross** Basel  
*Tracing maps in underserved areas for risk reduction and disaster response.* October-November 2024
- **Jugendsession** Bern  
*Formulating demands to be passed on to the Parliament: Neutrality in Media.* November 2011
- **Jugendsession** Bern  
*Formulating demands to be passed on to the Parliament: Electronic Voting.* November 2009

## NAMED REFERENCES

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- **Dr. Andreas Jocksch**  
*Senior Research Software Engineer*
  - Phone: +41 91 610 82 32
  - Mail: andreas.jocksch@cscs.ch

**Relation:** Supervisor during internship at CSCS on writing regression checks for Piz Daint, Cray XC40/XC50 production system.
- **Prof. Dr. Ralf Hiptmair**  
*Full Professor and Deputy head of Dep. of Mathematics / Head of Seminar for Applied Mathematics at ETH Zurich*
  - Phone: +41 44 632 34 04
  - Mail: ralf.hiptmair@sam.math.ethz.ch

**Relation:** Supervisor of Computational Science Master's Thesis on solving the transmission scattering problem using BEM (C++).

▪ **Prof. Dr. Siddhartha Mishra**

*Full Professor at the Dep. of Mathematics / Deputy head of Seminar for Applied Mathematics at ETH Zurich*

- Phone: +41 44 632 75 63
- Mail: siddhartha.mishra@sam.math.ethz.ch

**Relation:** Supervisor of Mathematics Master's Thesis on differentiable haemodynamics solver in JAX (Python).

▪ **Dr. Georgios Kissas**

*Postdoctoral Fellow at ETH AI Center + BAUG + MAVT + SAM*

- Phone: +41 78 969 95 77
- Mail: gkissas@ai.ethz.ch

**Relation:** Co-Supervisor of Mathematics Master's Thesis on differentiable haemodynamics solver in JAX (Python) and Supervisor of publication thereof.