

# Diego Renner

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 [DiegoRenner](#)

</> C++, Python, Rust

Date of Birth: 29.08.1995

Nationality: Swiss

(Items relating to projects and papers are clickable.)



## EXPERIENCE

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### ▪ Novartis Pharma AG

*Intern*

Basel, Switzerland

June 2024 - December 2024

- Developing ML/AI algorithms for classifying Raman spectroscopy data.

**Technologies:** imbalanced-learn, JAX, Matplotlib, NumPy, scikit-learn, SciPy, TensorFlow

**Theory:** (C)NN, GMM, PCA, SMOTE

### ▪ plantime

*Software Engineer*

Basel, Switzerland

January 2024 - Today

- Developing ML/AI algorithms for optimizing shift scheduling.

**Technologies:** Rust

**Theory:** Evolutionary optimization algorithms

### ▪ ETH Zürich

*Teaching Assistant*

Zurich, Switzerland

Sepember 2021 - February 2022

- Teaching Assistant for Lecture "Numerical Methods for Computer Science".

**Technologies:** C++

**Theory:** ODEs, PDEs and numerical algorithms to solve them

### ▪ ETH Zürich

*Research Assistant*

Zurich, Switzerland

September 2020 - June 2021

- Hired for continued development of BEM code that was implemented in Masters Thesis.

**Technologies:** C++, CMake, Git

**Theory:** BEM, Resonances in Transmission Scattering Problems

### ▪ ETH Zürich

*Teaching Assistant*

Zurich, Switzerland

September 2020 - February 2021

- Teaching Assistant for Lecture "Numerical Methods".

**Technologies:** C++, CMake

**Theory:** ODEs, PDEs and numerical algorithms to solve them

▪ **CSCS Swiss National Supercomputing Center**

*Internship*

Lugano, Switzerland

May 2018 - August 2018

- Writing regression checks for Piz Daint, Cray XC40/XC50 production system.

**Technologies:** C, MPI, MySQL, Kibana, Grafana

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## EDUCATION

▪ **ETH Zürich**

*M.Sc. Mathematics*

Zurich, Switzerland

September 2021 - December 2023

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

▪ **ETH Zürich**

*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 - Februar 2018

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

▪ **Gymnasium Bäumlihof**

*Matura, Specialization Biology & Chemistry*

Basel, Switzerland

August 2009 - July 2014

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## CERTIFICATES & EXTRACURRICULARS

▪ **Ready, set, go! A short introduction for Student Teaching Assistants**

*Education Development and Technology, ETH Zurich*

(remote) Zurich

April 2020

- Improving didactic skills
- Setting goals for upcoming teaching activity

▪ **Effective High-Performance Computing & Data Analytics with GPU**

*Summerschool, CSCS-USI*

(remote) Lugano, Switzerland

July 2020

- GPU: architecture & programming (CUDA, OpenACC)
- JupyterLab
- Python: Numpy, SciPy, Dask, Numba
- ML: Rapids
- Deep Learning: TensorFlow

▪ **International Consulting Network (ICON)**

*Student Consulting Network*

Shanghai, (remote) Belo Horizonte

March 2017 - Februar 2018

- Market Research & Trend Analysis consulting for CREP (Real Estate, China) & Lalubema (Private Security, Brazil)

## 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. (Masters Thesis, Computational Science)
- Detecting Near Resonances in Acoustic Scattering: Continued development of root finding algorithm from the Masters Thesis using empirical evidence and state of the art computation of singular values. (Published Paper)
- 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. (Masters Thesis, Mathematics)

## PUBLICATIONS

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- Detecting Near Resonances in Acoustic Scattering: Continued development of root finding algorithm from the Masters Thesis using empirical evidence and state of the art computation of singular values. (Published)
- 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. (Work in Progress)

## NAMED REFERENCES

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- **Dr. Andreas Jocksch**

*Senior Research Software Engineer*

- Phone: +41 91 610 82 32
- Mail: andreas.jocksch@csccs.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 Zürich*

- Phone: +41 44 632 34 04
- Mail: ralf.hiptmair@sam.math.ethz.ch

**Relation:** Supervisor of Computational Science Masters 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 Zürich*

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

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