Elishan Christian Braun, Ph.D

Address

Nationality

Mobile Phone
Email

Work Experience

May 2022 - Sep 2023 **Postdoctoral Research Fellowship**
MOX-Dipartimento di Matematica, Politecnico di Milano, Milan, Italy

Development of algorithm for the Retrodeformation of terrain and restoration of given terrain for previous geological time based on the Geochron approach and geological data with finite element methods and implementation into a python library on Github.

Supervisor: Luca Formaggia, Anna Scotti, Alessio Fumagalli

Nov 2020 - Nov 2021 **Postdoctoral Research Fellowship**
Istituto per le Applicazioni del Calcolo M.Picone, Consiglio Nazionale delle Ricerche, Rome, Italy

Numerical simulation of non-Newtonian flows undergoing a pressure gradient based on innovative mathematical models: a) flow from a 3D printer head and b) flow of a morainic glacier solicited by an accumulation zone.

Supervisor: Daniela Mansutti, Marco Lauricella

Education

2017-2021 **Ph.D. in Mathematics** - University Roma Tre, Italy, *with honours (lode)*

Thesis: "Organs-On-Chips: mathematical modelling and parameter estimation"
Advisor: Roberto Natailini and Gabriella Bretti(Istituto per le Applicazioni del Calcolo-CNR)
Topics: Mathematical Modelling, Chemotaxis, Inverse Problems, Parameter Estimation, Optimization, Data Assimilation, Microfluidic Chip

2014-2017 **Master of Science in Applied Mathematics** - University of Kassel, Germany

Thesis: "Numerical Analysis and Visualisation of Implicit Ordinary Differential Equations"
Advisor: Werner M. Seiler(University of Kassel)
Topics: Implicit ODE, Singularities, Vessiot distribution, Numerical Integration, Visualisation.

2010-2014 **Bachelor of Science in Mathematics** - University of Kassel, Germany

Thesis: "Discrete Gradientmethods for Hamiltonian Systems with Constains"
Advisor: Werner M. Seiler(University of Kassel)
Topics: ODE, Numerical Analysis, Hamiltonian Systems, Numerical Integration.

Conferences and Workshops

May 2023 Speaker at the conference

"Math 2 Product (M2P) Emerging Technologies in Computational Science for Industry, Sustainability and Innov
Taormina, Italy
Talk title: "Numerical methods for 3D geological restoration "

Sept 2021 Speaker at the online conference

"Mathematical Modelling and Control for Healthcare and Biomedical Systems",
Italian National Research Council (CNR), Rome, Italy
Talk title: " Mathematical modelling and model calibration of organ-on-chips."

May 2021 Speaker at the online conference

"MBMC2021 : Mathematical Biology on the Mediterranean Coast",
Paris, France
Talk title: "Mathematical modelling and parameter estimation of Organ-on-chips (OOC)."

Feb 2021 Poster Presentation at the online conference

"DSABNS2021 : Dynamical Systems Applied to Biology and Natural Sciences",
Trento, Italy
Poster title: "A Multi-Domain Transmission Model for Microfluidic Chips"

Skills

- **Programming Languages**

  MATLAB, Fortran, C/C++, Java, Python, Copasi, R

- **Languages**

  German: Native
  English: Proficient
  Italian: Intermediate
  Portuguese: Beginner

Publications

- Braun, Elishan, Werner M. Seiler, and Matthias Seiß. *"On the numerical analysis and visualisation of implicit ordinary differential equations."* Mathematics in Computer Science 14.2 (2020): 281-293.
- Braun, Elishan Christian, Gabriella Bretti, and Roberto Natalini. *"Mass-preserving approximation of a chemotaxis multi-domain transmission model for microfluidic chips."* Mathematics 9.6 (2021): 688.
- Braun, Elishan Christian, Gabriella Bretti, and Roberto Natalini. *"Parameter Estimation Techniques for a Chemotaxis Model inspired by Cancer-On-Chip (COC) Experiments"* International Journal of Non-Linear Mechanics 140 (2022): 103895.
- Braun, Elishan Christian, Daniela Mansutti, and Kumbakonam R. Rajagopal. *"Numerical solution of a two-dimensional rock-glacier flow model via the pressure method."* preprint(2024) submitted