

ABOUT ME

I am a curious and creative problem-solver. Fascinated by how artificial intelligence, maths, and computing intertwine, I develop meta-learning techniques for rapid model adaptation to novel settings. My commitment to lifelong learning is reflected in my research interests, my community outreach, and my hobbies.

SKILLS

Flow Matching

Machine learning

Signal processing

Simulation

Automatic differentiation

Optimal control

Finite Elements/Volumes

OpenMP

Networks

Cloud Computing

Graphs

HPC

Optimisation

PDEs

MPI

OpenCL

Web development

Multilingual

Teamwork

Rigour

Communication

Flexibility

Adaptability

Hard work

Efficiency

TOOLS

C/C++

Julia

TensorFlow

Git

Linux

Docker

CUDA

Python

JAX

PyTorch

AWS

LaTeX

LANGUAGES

English

French

Japanese

Spanish

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ROUSSEL DESMOND NZOYEM

PhD candidate blending machine learning, scientific computing, and high-performance computing solutions for science.

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EDUCATION

PhD in Interactive Artificial Intelligence | University of Bristol | Bristol, UK

- September 2021 — September 2025
- Combining physics- and data-driven techniques for highly performant simulation and control of PDEs;
 - Enhancing neural ordinary differential equations and generative modelling with meta-learning.
 - Supervised by Dr Tom Deakin, Pr David Barton, and Pr Simon McIntosh-Smith

MSc in Applied Mathematics (CSMI) | University of Strasbourg | Strasbourg, FR

- September 2019 — September 2021
- Modelisation, simulation, and optimisation of physical systems on high-performance computing clusters;
 - Theoretical and practical concepts on differential equations, signal processing, and deep learning;
 - Completed the degree with distinction (FR: Très Bien, UK: 1st, US: 4.0).

Bachelor's degree (BSc) in Mathematics | Aix-Marseille University | Marseille, FR

- November 2017 — July 2019
- Finalising my BSc with a particular accent on pure mathematical concepts; achieved with 15.25/20.

Advanced technician's degree (Mechatronics) | Oshima College of Technology | Oshima, JP

- April 2017 — June 2019
- Intensive training focusing on mechanical, electrical, and computer science engineering;
 - Assembly languages for the CASL and CASL II machines.

Associate degree in Computer Science | University of the People | Pasadena, USA

- January 2017 — April 2019
- Theoretical and applied computer science followed by web and software development projects.
 - Assembly language and low-level computer architecture

Associate degree in Maths. and Phys. Sci. | Polytechnique (NASEY) | Yaoundé, CMR

- September 2014 — April 2017
- First two years (MSP) consisting of mathematics and physics common core subjects;
 - Ranked sixth at the entrance examination amongst more than 4000 candidates;

GCE A-level (Baccalaureate) | Gov. Bilingual High Shcool | Bamenda, CMR

- July 2014
- Focused on mathematics, physics, computer science and chemistry;
 - Finished top in Cameroon's North-West region with grade A.

RESEARCH EXPERIENCE

Data Science PhD Internship | SLB (Schlumberger) | Abingdon, UK

- June 2024 — September 2024
- Scaling Graph Neural Networks (GNNs) as proxy models for carbon capture and storage;
 - Focus on computational efficiency with JAX, super-resolution and transfer-learning on large GNNs.

Interactive AI CDT Summer Project | UoB HPC Research Group | Bristol, UK

- May 2022 — August 2022
- Improved algebraic multigrid linear solvers with Graph Neural Networks (GNNs);
 - Tested several GNN library including the PyTorch-based DGL and the JAX-based Jraph.

MSc Internship | Jacques-Louis Lions Laboratory (Sorbonne University) | Paris, FR

- February 2021 — July 2021
- Studied the collapse of the Arctic ice cap via a percussive granular model of the MIZ. Ice floes were modelled with mass-spring-damper systems, and fracture with the Francfort-Marigo model.

MSc Internship | Research Institute Mathématiques Avancées (IRMA) | Strasbourg, FR

- June 2020 — August 2020
- Inverse problem using ML (VNet) for the supervised reconstruction of a domain's density. The radiative transfer equation (RTE) was solved with a Finite Volume splitting scheme to generate ground truth data.

TEACHING

Teaching Assistant

University of Bristol | Bristol, UK
January 2022 — Present

- Introduction to Artificial Intelligence,
- High-Performance Computing,
- Scientific Computing,
- Engineering Mathematics,
- Etc.

Outreach Ambassador, Widening Participation Tutor

University of Bristol | Bristol, UK
September 2022 — Present

Lead for the CodeMakers initiative: fostering curiosity in young students with after-school programming activities. Delivering STEM sessions to aspiring UoB students.

Volunteer Private Instructor

ExamStar | Bristol, UK
September 2022 — July 2024
Affordable mathematics lessons for primary and secondary school pupils via Zoom and MS Teams.

Volunteer Language Tutor

UoB Global Lounge | Bristol, UK
September 2022 — December 2022
Bi-weekly position as a French language tutor at the Global Lounge's Language Café.

Private Instructor

Complétude | Strasbourg, FR
January 2020 — January 2021
Weekly monitoring of high school students in mathematics and computer science with group tutoring during holidays.

TRAINING & CERTIFICATES

AWS Machine Learning Foundations 2022

Udacity — October 2022

React Front to Back 2022

Packt — September 2022

Deploying a Model for Inference at Production Scale

NVIDIA — August 2022

Introduction to Higher Education (HE) Teaching

UoB — January 2022

Electrotechnique I

EPFL — December 20125

REFERENCES

Dr. Tom Deakin (HPC Research Group, University of Bristol)
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Pr. David Barton (University of Bristol)
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Pr. Christophe Prud'homme (IRMA, Unistra)
prudhomm@math.unistra.fr — +33 3 68 85 00 89

SELECTED PUBLICATIONS

MixER: Better Mixture of Experts Routing for Hierarchical Meta-Learning

RD Nzoyem, G Stevens, A Sahota, DAW Barton, T Deakin
February 2025
arXiv, SCOPE Workshop @ ICLR 2025

Neural Context Flows for Meta-Learning of Dynamical Systems

RD Nzoyem, DAW Barton, T Deakin
February 2025
International Conference on Learning Representations (ICLR) 2025

Extending Contextual Self-Modulation: Meta-Learning Across Modalities, Task Dimensionalities, and Data Regimes

RD Nzoyem, DAW Barton, T Deakin
September 2024
arXiv

A comparison of mesh-free differentiable programming and data-driven strategies for optimal control under PDE constraints

RD Nzoyem, DAW Barton, T Deakin
November 2023
SuperComputing (SC) 2023 Workshop on AI4S

AWARDS AND SCHOLARSHIPS

CDT Studentship | UK Research and Innovation | Bristol, UK
June 2021

Fully-funded scholarship to pursue a PhD within the Interactive AI CDT at the University of Bristol.

MEXT (Monbukagakusho) | Japanese Government | Tokyo, JP
November 2016

For this prestigious international scholarship, I was the only one chosen amongst hundreds of candidates.

Fondation Hoffmann | University of the People (UoPeople) | Pasadena, USA
April 2017 & April 2018

Scholarship granted (and renewed) to fully support assessment fees.

Excellence Award | The President of the Republic of Cameroon | Yaoundé, CMR
July 2015 & July 2016

Prize awarded for two consecutive years for my outstanding accomplishments at Polytechnique Yaoundé.

Excellence Award | PKFokam Institute of Technology | Yaoundé, CMR
July 2014

For my fourth place at the PKFokam Excellence national mathematical olympiad.

Excellence Award | Les Brasseries du Cameroun | Bamenda, CMR
October 2014

Grant awarded to the best student at the GCE A-level in every region of Cameroon.

HOBBIES

Video games and coding: Fan and designer;
Cinema and music: Composition, documentary movies;
Football: Regular practice at the amateur level;
Traveling: Loves visiting the farthest corners of Earth.