

ABOUT ME

I am a curious and creative problem-solver, fascinated by how artificial intelligence, maths, and computing intertwine. My commitment to lifelong learning is reflected in my research interests, my community outreach, and my hobbies.

SKILLS

Transformers

Linear RNNs

Physical AI

Diffusion/Flow matching

GNNs

Simulation

Optimisation

Differentiable programming

Optimal control

CFD

PDEs

Finite Elements/Volumes

OpenMP

MPI

OpenCL

Web dev.

Inverse dynamics

Cloud Computing

Interpersonal: Teamwork, cross-cultural communication (fluent in 4 languages).

Work ethic: Rigour, adaptability, efficiency in dynamic and fast-paced environments.

TOOLS

C/C++

CUDA

Python

Julia

JAX

Git

AWS

Linux

TensorFlow

PyTorch

Docker

RESEARCH INTERESTS

- Artificial General Intelligence**
 - Out-of-distribution generalisation
 - Test-time training
- Physical AI**
 - Physics-informed machine learning
 - Robotic simulation & spatial computing
- ML Systems**
 - Linear recurrence
 - Hardware-aware training
 - Etc.

LANGUAGES

English

French

Japanese

Spanish

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ROUSSEL DESMOND NZOYEM

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EDUCATION

PhD in Machine Learning (Interactive AI) | University of Bristol | Bristol, UK
September 2021 — (Anticipated 2025)

- Meta-learning, test-time training, and parameter efficient fine-tuning for OoD generalisation;
- Physics-informed neural networks and generative models for sequential data and spatial computing;
- 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 analysis of partial differential equations, signal processing, and deep learning;
- Completed the degree with exceptional distinction (**FR:** 18.1/20—Excellent, **UK:** 1st, **US:** 4.0).

BSc in Mathematics | Aix-Marseille University | Marseille, FR
November 2017 — July 2019

- Strong accent on statistics, algebra, advanced calculus, and numerical analysis; achieved with 15.25/20.

Associate degree in 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 national entrance examination amongst more than 4000 candidates.

RESEARCH & WORK EXPERIENCE

Teaching Assistant | University of Bristol | Bristol, UK
January 2022 — Present

- Supported **MSc** units—Introduction to AI, High-Performance Computing, Computer Architecture, Cloud Computing—and **BSc** units—Scientific Computing, Engineering Mathematics (EMAT) 1&2.
- Received one Bristol Teaching Awards nomination for preparing and delivering lectures for EMAT.

Data Science Internship | SLB (Schlumberger) | Abingdon, UK
June 2024 — September 2024

- Scaled by 10X Graph Neural Networks (GNNs) inputs for proxy modelling of carbon capture and storage;
- Implemented novel JAX GNN layers using Jraph, and achieved 2X speedup compared to PyTorch's PyG;
- Achieved zero-shot super-resolution and transfer learning from small to large graphs.

PhD Summer Projects | HPC Research Group & Bristol Robotics Lab. | Bristol, UK
May 2022 — August 2022

- Extensively explored path planning and stable grasping under disturbance within Mujoco;
- Integrated NVIDIA's WARP and Mujoco's MJX for robotic spatial simulation and control (follow-up work);
- Accelerated algebraic multigrid linear solvers with GNNs, benchmarking DGL, PyG, and Jraph.

MSc Internship | Jacques-Louis Lions Laboratory (Sorbonne University) | Paris, FR
February 2021 — July 2021

- Theoretically studied the collapse of the Arctic ice cap via a percussive granular model. Ice floes were modelled with mass-spring-damper (MSD) systems, and fracture with the Francfort-Marigo model;
- Developed an interactive software for MSD percussion and fracture simulation using Python's Flask;
- Lead to my MSc thesis "Fracturing of ice floes by impact in a granular mode", supervised by Prof Stéphane Labbé.

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.

OUTREACH & VOLUNTEERING

Outreach Ambassador, Widening Participation Tutor

University of Bristol | Bristol, UK
September 2022 — Present
I lead the [CodeMakers](#) initiative to foster curiosity in young students with after-school programming activities. We also deliver 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.

Volunteer Staff

University of Bristol | Bristol, UK
September 2022
I worked aboard the SS Great Britain to set up and evaluate exhibitions for the FUTURES Festival of Discovery.

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 2015

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 Prudh'homme (IRMA, Unistra)
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SELECTED PUBLICATIONS

Weight-Space Linear Recurrent Neural Networks

RD Nzoyem, N Keshtmand, I Tsayem, DAW Barton, T Deakin
May 2025

arXiv Preprint

Reevaluating Meta-Learning Optimization Algorithms Through Contextual Self-Modulation

RD Nzoyem, DAW Barton, T Deakin
May 2025

Conference on Lifelong Learning Agents (CoLLAs) 2025

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

RD Nzoyem, G Stevens, A Sahota, DAW Barton, T Deakin
February 2025

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

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

MOST RECENT PROJECTS

MJ-WARP (Since May 2025)

- Investigating gradient-free generalisation in-simulation with the open-source MuJoCo Warp (MJWarp).
- Ongoing project (code available soon)

WARP (June 2025)

- Assembled a team of PhDs and postdocs from UK, France, and the USA to redefine test-time sequence modelling
- Led to the preprint "Weight-Space Linear Recurrent Neural Networks"
- Code: <https://github.com/ddrous/warp>

AWARDS AND SCHOLARSHIPS

- Financial Assistance** by CRM (May 2025) — Assistance for all expenses to attend the Mathematical Foundations of Data Science thematic programme at the CRM in Montréal.
- Financial Assistance** by ICLR (March 2025) — Funding for registration, travel, and accommodation to present multiple research papers at ICLR'25 in Singapore.
- CDT Studentship** by UK Research and Innovation (June 2021) — Fully-funded scholarship to pursue a PhD within the Interactive AI CDT at the University of Bristol.
- MEXT (Monbukagakusho)** by The Japanese Government (November 2016) — For this prestigious international scholarship, I was the only one chosen amongst hundreds of candidates.
- Fondation Hoffmann** by University of the People (April 2017 & April 2018) — Scholarship granted (and renewed) to fully support assessment fees.
- Excellence Award** by The President of the Republic of Cameroon (July 2015 & July 2016) — Prize awarded for two consecutive years for my outstanding accomplishments at Polytechnique Yaoundé.
- Excellence Award** by PKFokam Institute of Technology (July 2014) — For my fourth place at the PKFokam Excellence national mathematical olympiad.
- Excellence Award** by Les Brasseries du Cameroun (October 2014) — Grant awarded to the best student at the GCE A-level in every region of Cameroon.

HOBBIES & PERSONAL SKILLS

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.
Languages: English & French (*native*), Japanese (*proficient*), Spanish (*basic*).