

Jason Matthews

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Experience

Memorial University of Newfoundland

May 2024 - Present

Research Assistant - Department of Mathematics and Statistics

- Developed Python library implementing physics-informed neural networks (PINNs) and deep operator networks to solve ordinary and partial differential equations, using mainly Python, C++, and frameworks TensorFlow and JAX.
- Created entire documentation website demonstrating an ability to create high-quality documentation.
- Developed machine learning expertise while making contributions in improving adaptive point selection and meta-learned optimization, and designing user-friendly interfacing which reduces the difficulties associated with alternative packages

Paradigm Engineering

Sept 2024 – Present

Software Team Member (Extra Curricular)

- Designed and implemented main waypoint finding algorithm using mainly ROS2, C++, and Python within self-created Gazebo Classic simulations for a Pixhawk 4 autopilot controller to make an autonomously driving kart.
- Worked with printed circuit boards as well as many embedded systems such as ESP32's and Arduino's.

Kent Building Supplies

May - Aug, 2020-2023

Seasonal Associate

- Redesigned seasonal floor plans and garden center to be more efficient for product movement and selling.
- Over experience, acted as every role in the store, as was often asked and expected to cover any section that needed help.

Awards/Scholarships

Schulich Leader Scholarship

June 2022

- Canada's most prestigious undergraduate STEM scholarship, awarded to only 100 graduating high school students in Canada each year, with only 50 for science students. Valued at \$80,000 over four years.

TechNL Making Waves Innovator Scholarship

Jan 2024

Memorial University Faculty of Science Dean's List

2022-2023, 2023-2024

Education

Memorial University of Newfoundland

Class of 2027

Bachelor of Science - Joint Honours in Computer Science and Pure Mathematics

Publications

PinnDE: Physics-Informed Neural Networks for Solving Differential Equations

Aug 2024

Jason Matthews, Alex Bihlo: Preprint: [10.48550/arXiv.2408.10011](https://arxiv.org/abs/10.48550/arXiv.2408.10011) [🔗](#), Website: <https://pinnde.readthedocs.io/en/latest/> [🔗](#)

Projects

Note: Many other projects not noted are on Personal Website (linked above) and GitHub page, and will gladly discuss

PinnDE - Research Project - github.com/JB55Matthews/PinnDE [🔗](#)

May 2024 - Present

- Library designed to give user-friendly access to physics-informed neural networks and deep operator networks for solving ordinary and partial differential equations. Designed in Python with TensorFlow, JAX, as well as using C++
- Research which has been funded by Memorial University of Newfoundland for three consecutive semesters.

Seam Carving - Personal Project - github.com/JB55Matthews/SeamCarving [🔗](#)

Aug 2024

- Java application which allows users to upload images and dynamically resize them using a technique known as seam carving, which removes unimportant sections of images while keeping important sections after resizing.
- This implementation uses the Sobel operator, edge detection, and dynamic programming for energy function computation.

Skills

Languages: Java, C/C++, Python, JavaScript, TypeScript, Go **Embedded:** ESP32, Arduino, Verilog

Frontend: HTML, CSS, AstroJS, ReactJS, TailwindCSS, **Database:** SQLite, MySQL

Tools: Git, GitHub Actions, Docker, TensorFlow, JAX, ROS/ROS2, Gazebo, RViz