Jason Matthews

◉ Pasadena/St. John's, NL ✉ jbmatthews@mun.ca 📞 (709) 660-8421 🔗 Personal Site ⌨ GitHub: JB55Matthews

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.
- Acted as every role in the store and became someone who was relied upon 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](#), 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, NodeJS, TailwindCSS, **Database:** SQLite, MySQL

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