

# Jason Matthews

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## Experience

**Memorial University of Newfoundland, St. John's, NL** **May 2024 - Present**  
*Research Assistant - Department of Mathematics and Statistics*

- Developing PinnDE, a large Python library implementing physics-informed neural networks and deep operator networks to solve ordinary and partial differential equations, using mainly Python, C++, and frameworks TensorFlow and JAX.
- Creating documentation website, (<https://pinnde.readthedocs.io/en/latest/> [🔗](#)), using ReadTheDocs, demonstrating an ability to create high-quality documentation.
- Wrote preprint (pending publication) "PinnDE: Physics-Informed Neural Networks for Solving Differential Equations", ([10.48550/arXiv.2408.10011](https://arxiv.org/abs/10.48550/arXiv.2408.10011) [🔗](#)), which has currently been cited in four journal articles.

**Paradigm Engineering, St. John's, NL** **Sept 2024 - Present**  
*Software Team Member (Student Group)*

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

**Kent Building Supplies, Corner Brook, NL** **May - Aug, 2020 - 2023**  
*Seasonal Associate*

- Worked to keep garden center product and soil filled throughout summer, as well as transitioning from summer to fall.

## 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 (\$2,826.00)** **Jan 2024**

**Memorial University Faculty of Science Dean's List** **2022 - 2023, 2023 - 2024, 2024 - 2025**

## Education

**Memorial University of Newfoundland** **Expected Graduation May 2027**  
*Bachelor of Science - Joint Honours in Computer Science and Pure Mathematics*

## Selected Projects

**Note:** Many other projects are on personal website and GitHub page (both linked above).

**Simulated Robotic Arm - Academic Project -** [github.com/JB55Matthews/Comp3766\\_FinalProject\\_Group12](https://github.com/JB55Matthews/Comp3766_FinalProject_Group12) [🔗](#) **Mar 2025**

- Using ROS, RViz, with C++ and Python scripts to implement and model the Barret Technologies 7 revolute joint WAM robotic arm in a RViz simulation.
- Implementation of forward and inverse kinematics through RViz with scripts to control joint and end-effector positions.

**Custom Sudoku Solver - Personal Project -** [github.com/JB55Matthews/Sudoku-CSP-Algorithm-Solvers](https://github.com/JB55Matthews/Sudoku-CSP-Algorithm-Solvers) [🔗](#) **Dec 2024**

- Interface in Java which allows users to input Sudoku puzzles and combine different csp algorithm techniques to solve them, including dfs with partial pruning, AC-3 inferencing, and minimum conflicts local search.

**Seam Carving - Personal Project -** [github.com/JB55Matthews/SeamCarving](https://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, Go, C, C++, Python, JavaScript/TypeScript    **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