Jean–Sébastien (JS) Dandurand

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# Education

**Carnegie Mellon University**

* Master of Science in Machine Learning Sep 2025 – Jan 2027

**University of Toronto**

* Honours Bachelor of Science, Computer Science and Mathematics (**4.0 cGPA**) Sep 2021 – May 2025

# WORK EXPERIENCE

**Machine Learning Engineering Intern** May 2024 – January 2025

## EmMea Inc.

## Participated in research and development of physics-informed neural networks architecture to solve partial difference equations (advection-diffusion) in emission transportation, achieving state-of-the-art relative L2 error in modelling 2D ADE equation

## Integrated implicit Runge-Kutta methods into model training and architecture, reducing need for training data by up to 80% while significantly improving numerical stability

## Applied transfer learning techniques to reduce model training time by up to 70%

**Teaching Assistant: Machine Learning, Computer Architecture, Differential Equations** September 2023 – May 2025

## University of Toronto

## Administered weekly tutorials giving lectures on machine learning, differential equations, logical circuit design, and coding in Assembly.

## Mentored and aided attendance of 20+ students through office hours and review seminars

# RESEARCH EXPERIENCE

**Undergraduate Research Intern** September 2023 – June 2025

## embARC Research Group

## Participated in developing retrieval framework for neural radiance field retrieval, utilizing high quality visual feature embeddings generated by vision-language models

## Researched efficient camera angle selection for high quality novel view synthesis, improving retrieval accuracy by up to 40%

## Participated in developing dynamic 3D Gaussian Splatting scenes by leveraging optical flow models, achieving a 6x speedup compared to state-of-the-art iterative methods

## Developed data preprocessing pipeline using COLMAP and Nerfstudio, reducing data preprocessing and compilation speeds by 75%

# PUBLICATIONS

## TOGS: Triangulated Optical Flow for 3D Gaussian Splatting Streaming

## Pending review at ICCV 2025

## Retri3D : 3D Neural Graphics Representation Retrieval

## Accepted at ICLR 2025

## Physics Informed Machine Learning for Emission Measurement

## Accepted at Digital Horizons: Energizing Transformation in Oil, Gas and Beyond (ASME DTOG2024): Digital Solutions for Gas Emissions

# HONOURS AND AWARDS

University of Toronto In-Course Scholar - $1,500 2024

University of Toronto Scarborough Dean’s List 2022, 2023, 2024

Sotherton Wadhams In-Course Scholar - $1,500 2022

University of Toronto Scholar - $16,500 2021