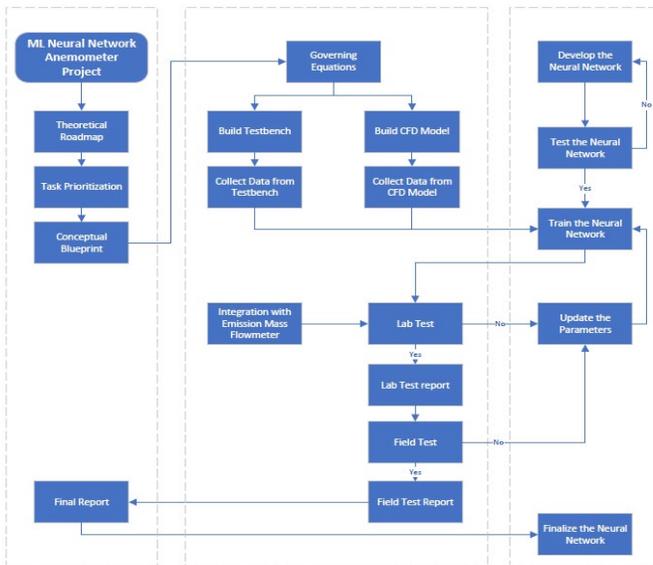


Machine Learning Identification of Real-Time Wind Direction and Velocity from a Novel Anemometer Integrated into an Emission Mass Flowmeter

[EmMea is developing a hardware-based anemometer intake system which will be integrated into an emission mass flowmeter for wind directions, used for emission measurement. The project proposes to use a machine learning algorithm to optimize the computing process to make it suitable for mobile and remote applications. A digital twin model will be developed, based on computational fluid dynamics, which will be verified via lab experiments and computer simulations using third-party software.



RECIPIENT:
EmMea



PARTNERS:
Adfast



TOTAL BUDGET:
\$679,949



AI FUNDING:
\$250,000



PROJECT DATES:
JUN 2024 –
OCT 2025



PROJECT TRL:
Start: 6
End: 7

APPLICATION

This technology is proposed to be used in emissions measurement for greenhouse gas emission (GHG) reporting, specifically sources of non-continuous GHG emissions and/or varying atmospheric and environmental condition for various market applications include oil and gas, agriculture, manufacturing, landfills, commercial real estate, and more.



PROJECT GOALS

- Advanced machine learning algorithms of a new anemometer.
- Conducted field tests to validate the anemometer using the new machine learning algorithms in combination with an emission mass flowmeter, enhancing its accuracy and efficiency in monitoring and measuring emissions.
- Develop GHG measurement partnerships and collaborations with stakeholders and clients in the target industries.

BENEFITS TO ALBERTA

- Real-time ability to measure GHGs from various industries.
- Improved measurement of GHGs, particularly from intermittent or non-continual sources, to improve emission reporting and management capabilities.
- Aiding Alberta’s goal of carbon neutrality by 2050.



2 Publications



1 New Product/Service



1 Patent filed in two countries



4 Project Jobs



2 Future Jobs

CURRENT STATUS

OCT 2025

The project has been complete, and the final public report will be posted in April 2026.

The project successfully developed and tested their smart anemometer technology and have plans for external verification and a full 12-month validation cycle. Additional learnings included systemic optimization of machine-learning hyperparameters that balances accuracy with computational efficiency, critical for remote and embedded application of the technology.