# Dr. Thomas Newman, Machine Learning Researcher

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Researcher at SRON Space Research Organisation Netherlands, developing deep learning algorithms for large-scale geospatial detection and quantification of global methane emission. I design, build, deploy and maintain automated machine learning pipelines and translate scientific results into actionable insights for international stakeholders to support rapid intervention and evidence-based climate policy. See CAMS Methane Hotspot Explorer.

## Skills

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|---|---|
| Programming | Python, R, SQL, Bash. |
| ML/AI | Scikit-learn, TensorFlow, PyTorch, JAX. |
| DevOps | GitHub, AWS, FastAPI, Docker. |
| Databases | MySQL. |
| Visualisation | Matplotlib, Seaborn, Tableau, Plotly, Streamlit. |
| Languages | Native French and English. B1 German. |

## Professional Experience

**ML Research & Atmospheric Scientist**: *Oct 2025 - Present*
Space Research Organisation Netherlands.

- Developing deep learning algorithms for large-scale detection of methane sources, increased algorithm's precision by 38%.
- Building and maintaining automated detection pipelines for near real-time monitoring, processing 20M+ data points daily.
- Defining metrics and evaluation frameworks for ambiguous analytical problems where data quality and labeling are limited.
- Working across teams and stakeholders to provide analytical guidance, align priorities, and produce monthly project reports.

**PhD Researcher**: *Jun 2022 - Oct 2025*
Lancaster University/Shell plc.

- Developed and published novel applications of Bayesian inversion models and machine learning algorithms.
- Designed and implemented methodologies that solved complex industry challenges, delivering measurable real-world impact.

**Data Science Consultant**: *Sep 2021 - Oct 2025*
Lancaster University

- Consulted for private, charitable, and government sectors on statistical projects, including airport slot allocation, recommender systems, and route optimisation.
- Collaborated in small teams under tight deadlines, leveraging effective presentation skills and strategic task allocation.

**Statistics Tutor**: *Sep 2020 – Oct 2025*
University of Glasgow/Lancaster University

- Taught Master's level courses in Python, RStudio, Bayesian inference, and time series analysis.
- Delivered undergraduate curriculum across all levels, including statistical inference, models, and core statistics principles.

**Data Scientist**: *Aug 2019 – Jul 2020*
NHS Scotland

- Served as data scientist for NHS Scotland monitoring COVID-19 cases, emergency service attendance, and waiting times.
- Processed healthcare data, generated predictive models, and produced weekly KPI status reports.

## Education

**Ph.D. - Statistics & Machine Learning**: *Sep 2022 - Oct 2025*
Lancaster University

**MRes - Statistics & Operations Research**: *Oct 2021 - Sep 2022*
Lancaster University
Grade: Distinction

**MSci - Statistics with Work Placement**: *Sep 2018 - Jul 2021*
University of Glasgow
Grade: Distinction

**Bsc - Finance & Statistics**: *Oct 2016 - Sep 2018*
University of Glasgow
Grade: First

## Example Projects

**Energy Forecasting and Profit Optimisation**

*Gaussian Process, XGBoost, Linear Program, Stochastic Program*

Developing hourly energy consumption and production forecasts for multiple neighbourhoods over several months. Optimising daily trading strategies to maximise profits on the energy market. (https://github.com/NewmanTHP/Energy-Prediction-and-Profit-Optimisation/tree/main)

**Spatio-Temporal Methane Emission Characterisation**

*Particle Filter, Deep Neural Networks, JAX*

Detecting and quantifying methane source locations in obstructed unsteady-state flow fields using deep learning surrogate modelling of atmospheric methane transport. (https://github.com/NewmanTHP/Deep-Learning-Surrogates-for-Real-Time-Gas-Emission-Inversion)

**Housing Price Prediction using Gaussian Processes**

*Scikit-learn, Gaussian Process, EDA, Feature Engineering*

Cleaned data, conducted exploratory analysis, engineered features, and applied Gaussian process regression to predict California house prices. (https://github.com/NewmanTHP/California_Housing/blob/main/california_housing.ipynb)

## Presentations

- *May 2026* Invited speaker by Shell plc - Netherlands.
- *Sep 2025* Invited speaker by Shell plc - Netherlands.
- *Jun 2025* BayesComp 2025 - Singapore.
- *Oct 2024* Invited speaker by the Thuerey Group - Technische Universität München - Germany.
- *Jul 2024* 2024 ISBA World Meeting - International Society for Bayesian Analysis - Italy.
- *Jan 2024* STOR-i Annual Conference 2024 - Lancaster University - UK.
- *Sep 2023* Workshop on Ecological and Environmental Statistics - Lancaster University - UK.
- *Jun 2023* Nordic Probabilistic AI School - Norwegian University of Science and Technology (NTNU) - Norway.

## Publications

- Newman, Thomas, et al. "Probabilistic inversion modeling of gas emissions: A gradient-based MCMC estimation of Gaussian plume parameters." The Annals of Applied Statistics 19.4 (2025): 2937-2956.
- Newman, Thomas, et al. "Deep Learning Surrogates for Real-Time Gas Emission Inversion." arXiv preprint arXiv:2506.14597 (2025).
- Newman, Thomas HP. Probabilistic Inversion Modelling of Atmospheric Gaseous Emissions. PhD Thesis. Lancaster University (United Kingdom), 2025.

## Awards and Funding

*Jul 2024* 2024 ISBA World Meeting - Best Research Poster Award.

*Jun 2024* Raised funding and organised BayesAI 2024 conference. (https://bayesaiworkshop.github.io/)