



Lorin Werthen-Brabants

FWO Fellow at Ghent University

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Postdoctoral researcher at IDLab – Ghent University working on trustworthy machine learning and uncertainty quantification, with applications spanning healthcare diagnostics, time-series analysis, and control.

Professional Experience

2025–2028	Postdoctoral Fellow <i>FWO & IDLab – imec, Ghent University</i> Focus on Trustworthy Machine Learning (TML) and uncertainty quantification in deep learning models, with applications in healthcare diagnostics. Grant number 1264826N.
2023–2025	Postdoctoral Researcher <i>IDLab – imec, Ghent University</i> Research focused on emerging probabilistic hardware (p-bits), with a focus on Model Predictive Control.
2019–2023	PhD Student <i>IDLab – imec, Ghent University</i> Dissertation: “Quantifying Uncertainty and Improving Reliability of Time-Series Based Deep Learning Models.”
2018–2019	Machine Learning Engineer <i>Robovision</i> Developed machine learning pipelines for computer vision applications, transitioning to academia for deeper exploration of research questions.

Education

2019–2023	PhD in Computer Science <i>Ghent University</i> Dissertation: “Quantifying Uncertainty and Improving Reliability of Time-Series Based Deep Learning Models.” Promoters: Prof. dr. ir. Tom Dhaene, Prof. dr. mult. Dirk Deschrijver.
2016–2018	MSc in Computer Science <i>Ghent University</i> Thesis focused on machine learning methods for time-series data.
2013–2016	BSc in Informatics <i>Ghent University</i>

Selected Publications

- [1] **Werthen-Brabants, L.**, et al. (2024). “Deep Learning-Based Event Counting for Apnea-Hypopnea Index Estimation using Recursive Spiking Neural Networks.” *IEEE Transactions on Biomedical Engineering*.
 - [2] **Werthen-Brabants, L.**, et al. (2022). “Split BiRNN for real-time activity recognition using radar and deep learning.” *Scientific Reports*.
 - [3] **Werthen-Brabants, L.**, et al. (2022). “Uncertainty quantification for appliance recognition in non-intrusive load monitoring using Bayesian deep learning.” *Energy and Buildings*.
 - [4] Bhavanasi, G., **Werthen-Brabants, L.**, et al. (2022). “Patient activity recognition using radar sensors and machine learning.” *Neural Computing and Applications*.
 - [5] Castillo-Escario, Y., **Werthen-Brabants, L.**, et al. (2022). “Convolutional neural networks for Apnea detection from smartphone audio signals: effect of window size.” *IEEE EMBC Conference*.
- Full publication list at werthen.com/publications and at the end of this document.

Grants and Awards

FWO Postdoctoral Fellowship

Funded by the Research Foundation Flanders (FWO) for postdoctoral research on Trustworthy ML and uncertainty quantification in deep learning (2025–2028).

Academic Representation

Selected as a PhD representative for the Flanders AI Research Program (2023).

Invited Talks

Trustworthy and Reliable (Deep) Machine Learning for Healthcare

IBEC, Barcelona, Spain (2025)

Trustworthy ML for Healthcare: Challenges and Developments

Winkelhaak, Antwerp, Belgium (2024)

Teaching and Supervision

Teaching Assistant

Courses on Computer Science, Machine Learning, and Logic at Ghent University (2019–Present).

Master’s Thesis Supervision

Supervised multiple Master’s theses, with students publishing conference papers under guidance:

- Vincent-De Sloover, Louis, et al. “Tailoring Radar-Based Patient Monitoring Models to Real-Life Needs using Utility Maximization.” *2022 19th European Radar Conference (EuRAD)*. IEEE, 2022.
- Tuytte, Victor, et al. “Optimized Data Transmission for Radar-Based Edge-Cloud Human Activity Recognition via Quantization.” *2024 21st European Radar Conference (EuRAD)*. IEEE, 2024.

Service and Outreach

Peer Review Service

Regular reviewer for *Scientific Reports* and *IEEE Transactions on Biomedical Engineering*.

Science Communication

Featured in public AI discussions, including television appearances (e.g., Karrewiet 2019, VRT NWS Laat 2024).

Mobility and Research Stays

Visiting Researcher – University of Sydney, Australia (2022)

Research Interests

Trustworthy Machine Learning (TML) · Uncertainty Quantification in Deep Learning · Event-Based Time Series Analysis · Multimodal Data Integration · Self-Supervised Learning for Healthcare Applications

Skills

Programming Languages

Python, C, C++, MATLAB

Deep Learning Frameworks

TensorFlow, PyTorch

Data Science

Time Series Analysis, Uncertainty Quantification, Statistical Modeling, Data Visualization

Languages

English (C2) • Dutch (C2, Native) • French (B2) • Spanish (A2)

Full List of Publications

- [1] Niels Jodts, **Lorin Werthen-Brabants**, Sofie Aerts, et al. (2026). “Data-driven hypothesis discovery from disease trajectories in multiple sclerosis.” *Frontiers in Immunology*.
- [2] Sofie Aerts, **Lorin Werthen-Brabants**, Hamza Khan, et al. (2026). “Combining Magnetic Resonance Imaging and Evoked Potentials Enhances Machine Learning Prediction of Multiple Sclerosis Disability Worsening.” *Frontiers in Immunology*.
- [3] **Lorin Werthen-Brabants**, Pieter Simoens (2025). “Ising Machines for Model Predictive Path Integral-Based Optimal Control.” *NeurIPS Workshop: 2nd edition of Frontiers in Probabilistic Inference: Learning meets Sampling*.
- [4] Hamza Khan, Henry C. Woodruff, Diana L. Giraldo, et al. (2025). “Leveraging Hand-Crafted Radiomics on Multicenter FLAIR MRI for Predicting Disability Progression in People with Multiple Sclerosis.” *Frontiers in Neuroscience*.
- [5] **Lorin Werthen-Brabants**, Tom Dhaene, Dirk Deschrijver (2025). “The Role of Trustworthy and Reliable AI for Multiple Sclerosis.” *Frontiers in Digital Health*.
- [6] **Lorin Werthen-Brabants**, Yolanda Castillo-Escario, Willemijn Groenendaal, Raimon Jané, Tom Dhaene, Dirk Deschrijver (2024). “Deep Learning-Based Event Counting for Apnea-Hypopnea Index Estimation using Recursive Spiking Neural Networks.” *IEEE Transactions on Biomedical Engineering*.
- [7] Victor Tuytte, Arash Heidari, **Lorin Werthen-Brabants**, Tom Dhaene, Ivo Couckuyt (2024). “Optimized Data Transmission for Radar-Based Edge-Cloud Human Activity Recognition via Quantization.” *Proceedings of the 2024 21st European Radar Conference (EuRAD)*.
- [8] Arash Heidari, **Lorin Werthen-Brabants**, Tom Dhaene, Ivo Couckuyt (2024). “Optimizing Memory Footprint for Radar-Based Human Activity Recognition on Resource-Constrained Devices.” *Proceedings of the 2024 21st European Radar Conference (EuRAD)*.
- [9] Arash Heidari, **Lorin Werthen-Brabants**, Sebastian Rojas Gonzalez, et al. (2024). “Towards Trustworthy Neural Networks for Certification by Analysis – Fuel Tank Flammability Reduction System.” *Proceedings of FrontUQ2024, Workshop on Frontiers of Uncertainty Quantification*.
- [10] Edward De Brouwer, Thijs Becker, **Lorin Werthen-Brabants**, et al. (2024). “Machine-learning-based prediction of disability progression in multiple sclerosis: An observational, international, multi-center study.” *PLOS Digital Health*.
- [11] Arash Heidari, **Lorin Werthen-Brabants**, Tom Dhaene, et al. (2024). “Data-Driven Surrogate Modeling for the Flammability Reduction System.” *Proceedings of AIAA SCITECH 2024 Forum*.

- [12] **Lorin Werthen-Brabants**, Tom Dhaene, Dirk Deschrijver (2023). “Reliable assessment of uncertainty for appliance recognition in NILM using conformal prediction.” *Electronics Letters*.
- [13] Geethika Bhavanasi, **Lorin Werthen-Brabants**, Tom Dhaene, Ivo Couckuyt (2023). “Open-set patient activity recognition with radar sensors and deep learning.” *IEEE Geoscience and Remote Sensing Letters*.
- [14] Louis Vincent-De Sloover, **Lorin Werthen-Brabants**, Geethika Bhavanasi, Tom Dhaene, Ivo Couckuyt (2022). “Tailoring Radar-Based Patient Monitoring Models to Real-Life Needs using Utility Maximization.” *Proceedings of the 2022 19th European Radar Conference (EuRAD)*.
- [15] **Lorin Werthen-Brabants**, Geethika Bhavanasi, Ivo Couckuyt, Tom Dhaene, Dirk Deschrijver (2022). “Quantifying Uncertainty in Real Time with Split BiRNN for Radar Human Activity Recognition.” *Proceedings of the 2022 19th European Radar Conference (EuRAD)*.
- [16] Yolanda Castillo-Escario, **Lorin Werthen-Brabants**, Willemijn Groenendaal, Dirk Deschrijver, Raimon Jane (2022). “Convolutional Neural Networks for Apnea Detection from Smartphone Audio Signals: Effect of Window Size.” *Proceedings of IEEE EMBC 2022*.
- [17] **Lorin Werthen-Brabants**, Tom Dhaene, Dirk Deschrijver (2022). “Uncertainty quantification for appliance recognition in non-intrusive load monitoring using Bayesian deep learning.” *Energy and Buildings*.
- [18] **Lorin Werthen-Brabants**, Geethika Bhavanasi, Ivo Couckuyt, Tom Dhaene, Dirk Deschrijver (2022). “Split BiRNN for real-time activity recognition using radar and deep learning.” *Scientific Reports*.
- [19] Geethika Bhavanasi, **Lorin Werthen-Brabants**, Tom Dhaene, Ivo Couckuyt (2022). “Patient activity recognition using radar sensors and machine learning.” *Neural Computing and Applications*.