

333, Cedar Street,
CT-06510, New Haven
USA

+32-499461863

+1(781)658-1748

✉ edward.debrouwer@gmail.com

🌐 [edebrouwer](#)

32 years old

Edward De Brouwer

Machine Learning Researcher

Education

- 2018–2023 **PhD in Machine Learning for Healthcare**, *KU Leuven*, Belgium, *Summa Cum Laude*.
Title: Machine learning modeling of time-dependent patient trajectories (with Prof. Yves Moreau)
- 2020–2024 **Bachelor in Philosophy**, *Institute of Philosophy, KU Leuven*, Belgium.
Specialization in Continental Philosophy and Phenomenology
- 2016–2017 **Master Degree in Financial Mathematics and Actuarial Sciences**, *UCLouvain*, Belgium,
2013–2014 *Magna Cum Laude*.
- 2011–2014 **Double Master Degree in Electrical Engineering**, *KU Leuven and UCLouvain*, Belgium,
Magna Cum Laude.
Specialization in Telecoms and Signal Processing.
- 2008–2011 **Bachelor in Engineering**, *UCLouvain*, Belgium, *Cum Laude*.
Options in Electrical and Mechanical Engineering

Experience

- 2023–Present **Postdoctoral Associate**, *Yale University*, New Haven, CT.
Development of geometric machine learning techniques to model spatio-temporal cellular interactions.
Developed new graph neural network methods for biological data.
Supervisor: Pr. Dr. Smita Krishnaswamy.
- 2018–2023 **Ph.D Student**, *ESAT, Katholieke Universiteit Leuven*, Leuven.
Machine learning for healthcare.
Thesis title : Machine learning modeling of time-dependent patient trajectories.
Supervisor : Pr. Dr. Ir. Yves Moreau.
Funded by a competitive personal FWO grant.
- 2022–2023 **Visiting Researcher**, *Massachusetts Institute of Technology (MIT)*, Boston, USA.
Researcher in the clinical ML group of Professor David Sontag. Working on modeling of clinical time series, survival analysis, and causal inference.
- May-Sep/2022 **Visiting Researcher**, *University of Toronto + Vector Institute*, Toronto, Canada.
Research stay in the group of Professor Rahul Krishnan, working on orthogonal polynomial representations to improve neural differential equations architectures.
- May-Jul/2021 **Machine Learning Intern**, *Microsoft Research*, Cambridge, United Kingdom.
Machine Learning Researcher supervised by Stephanie Hyland, co-supervised by Javier Gonzalez Hernandez and Melanie Pradier. Working on causal inference with uncertainty estimates for longitudinal observational data.
- 2020–2021 **Visiting Researcher**, *ETH Zürich*, Basel, Switzerland.
Machine Learning Researcher in the group of Prof. Karsten Borgwardt (MLCB). Working on topological data analysis and stochastic processes for medical time series data.

- Sep-Nov/2020 **Digital Arts Resident**, *Cinema Jolia*, Brussels, Belgium.
Worked on a digital artistic production, linking literature, photography and artificial intelligence. Production of "The Labyrinth", a poem generator through a journey in a labyrinth video game. Published in Backslash Lit, a magazine for digital literature. <http://3.134.244.254/>
- Oct-Dec/2019 **Machine Learning Researcher Intern**, *Janssen pharmaceutica*, Beerse, Belgium.
Machine learning for real world evidence in type-2 diabetes. Using CPRD data, I designed an algorithm to predict future occurrence of lower limb complication in type-2 diabetes.
- Jun-Sep/2019 **Artificial Intelligence Resident**, *[Google] X, the moonshot factory*, Mountain View, California.
Making the world a radically better place with machine learning empowered moonshots. Contributed to project Amber, aiming at addressing depression with EEG. Designed machine learning workflow to analyze the EEG data.
- Jun-Aug/2017 **Data Scientist Intern**, *Data Innovation Lab, AXA*, Brussels.
Worked on computer vision for car crash detection and estimation. Deep convolutional neural networks and visualization using class activation maps.
- 2016–2017 **Teaching Assistant**, *ISBA, Université Catholique de Louvain*, Louvain-la-Neuve.
I was in charge of the practical sessions of courses given by the Institute of Statistics, Bio-Statistics and Actuarial Sciences. Courses given : Statistics I, Statistics II and Econometrics
- 2014–2015 **Software Design Engineer**, *Alcatel-Lucent*, Antwerp.
I was member of the software development team for the G.Fast technology. Programming was done in C++.
- 2013–2013 **Research Student**, *IMEC Research Center*, Leuven.
As an internship student, I worked on the Massive MIMO project MAMMOET (European Consortium).
Part of my master thesis
- 2011–2011 **Tutor**, *UCL*, Louvain-la-Neuve.
I was in charge of the practical sessions of the course "LFSAB1104 : Methodes Numerique"

Selected publications and participation in international conferences

- Dec. 2023 **NeurIPS**, Huguet*, Tong*, De Brouwer*, et al., *A Heat Diffusion Perspective on Geodesic Preserving Dimensionality Reduction*.
- May. 2023 **ICLR**, Edward De Brouwer et al., *Anamnesic Neural Differential Equations with Orthogonal Polynomial Projections*.
- May. 2023 **ICLR**, Martijn Oldenhof, Adam Arany, Yves Moreau, Edward De Brouwer, *Weakly Supervised Knowledge Transfer with Probabilistic Logical Reasoning for Object Detection*.
- Dec. 2022 **NeurIPS**, Edward De Brouwer, *Deep Counterfactual Estimation with Categorical Background Variables*.
- April. 2022 **AISTATS**, Edward De Brouwer et al., *Predicting the impact of treatments over time with uncertainty aware neural differential equations*.
- April. 2022 **International Conference on Learning Representations (ICLR)**, Max Horn, Edward De Brouwer et al., *Topological Graph Neural Networks*.
- Sep. 2021 **Neurology**, Steve Simpson-Yap & Edward De Brouwer et al., *Associations of Disease-Modifying Therapies With COVID-19 Severity in Multiple Sclerosis*.
- July 2021 **Conference on Machine Learning, Optimization, and Data Science (LOD)**, Jaak Simm, Adam Arany, Edward De Brouwer and Yves Moreau, *Expressive Graph Informer Networks*.
Grasmere, United Kingdom

- May 2021 **International Conference on Learning Representations (ICLR)**, *Poster*, Edward De Brouwer et al., *Latent Convergent Cross Mapping*.
Vienna, Austria
- April 2021 **Computer Methods and Programs in Biomedicine**, *Journal article*, Edward De Brouwer et al., *Longitudinal machine learning modeling of MS patient trajectories improves predictions of disability progression*.
- Dec. 2020 **Conference on Neural Information Processing Systems (NeurIPS): Causality workshop**, *Spotlight*, Edward De Brouwer et al., *Latent Convergent Cross Mapping*.
Vancouver, Canada
- Nov. 2020 **Multiple Sclerosis and related disorders**, *Journal article*, Liesbet Peeters, ..., Edward De Brouwer et al., *Multiple Sclerosis Data Alliance—A global multi-stakeholder collaboration to scale-up real world data research*.
- June 2020 **International Conference of Machine Learning (ICML): Artemis workshop**, *Poster*, Edward De Brouwer et al., *Inferring Causal Dependencies between Chaotic Dynamical Systems from Sporadic Time Series*.
Vienna, Austria
- June. 2020 **Multiple Sclerosis Journal**, *Article*, Liesbet Peeters, ..., Edward De Brouwer et al., *COVID-19 in people with multiple sclerosis: A global data sharing initiative*.
- Dec. 2019 **Conference on Neural Information Processing Systems (NeurIPS)**, *Poster*, Edward De Brouwer et al., *GRU-ODE-Bayes: Continuous modeling of sporadically-observed time series*.
Vancouver, Canada
- Sep. 2019 **European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS) Conference**, *Talk and Poster*, Edward De Brouwer et al., *Introducing Machine Learning for full MS patient trajectories improves predictions for disability score progression*.
Stockholm, Sweden
- Dec. 2018 **Conference on Neural Information Processing Systems (NeurIPS): ML4Health workshop**, *Poster*, Edward De Brouwer et al., *Deep ensemble tensor factorization for longitudinal patient trajectories classification*.
Montreal, Canada

Talks

- September 2023 **Yale University**, Guided diffusion for cell trajectories prediction.
New Haven, USA
- March 2023 **KU Leuven**, Machine Learning for Patient Trajectories.
Leuven, Belgium
- September 2022 **Fields Institute**, Predicting the impact of treatments over time with uncertainty aware neural differential equations.
Toronto, Canada
- July 2022 **Harvard University**, *Data to Actionable Knowledge Lab*, Neural Differential Equations for Modeling Patient Trajectories.
Boston, USA
- Oct. 2021 **UC San Diego Health Department of Biomedical Informatics Seminar**, Machine Learning for Patients Trajectories.
San Diego, USA
- Oct. 2021 **Fall Workshop on Computational Geometry**, Topological Graph Neural Networks.
Montana State University, USA

- Sep. 2021 **University of Torino**, Neural Differential Equations: Handling irregularly sampled time series with a focus on healthcare..
Torino, Italy
- Jul. 2021 **Microsoft Research Cambridge**, Counterfactual ODEs : predicting the impact of treatments over time with uncertainty aware neural differential equations.
Cambridge, United Kingdom
- Nov. 2020 **Imperial College London**, *Invited speaker at the DataLearning seminar*, ODE-Based RNNs for sporadic time series..
London, United Kingdom
- Nov. 2020 **BeneLearn**, *Contributed Talk*, GRU-ODE-Bayes: Continuous modeling of sporadically-observed time series.
Leiden, Netherlands
- Nov. 2019 **Bienal Internacional Covalente**, *Keynote*, Machine learning for patient trajectories.
Cucuta, Colombia
- Nov. 2019 **IEEE EMBS Benelux Chapter symposium**, *Contributed Talk*, Dealing with sporadic observations for critical care patient trajectories.
Leuven, Belgium
- Dec. 2017 **BigData.be**, *Meetup*, Deep convolutional networks for car damages automatic detection.
Brussels, Belgium

Awards

- 2023 **PhD Thesis award**, Received the highest honours for my PhD thesis (top 95%).
- 2022 **FWO PhD Travel Grant**, Competitive travel grant for an internship at University of Toronto.
- 2019-2023 **FWO-SB PhD grant**, Competitive research grant (17% success rate) for a fully funded 4 years PhD program.
- 2022 **NeurIPS travel grant**.
- 2019 **NeurIPS travel grant**.

Teaching

- 2023 **Research Mentor**, *SUMRY - Yale University*, Research mentor for a 8 weeks undergraduate summer research program : Summer of Undergraduate Research at Yale. Topic: graph neural networks and differential geometry.
- 2021-2023 **Master Thesis Supervisor**, *KU Leuven*, Supervised two master thesis in the Artificial Intelligence Master program.
- 2016-2017 **Teaching Assistant**, *UCLouvain*, Teaching assistant for undergraduate courses in Statistics I, II and Econometrics.
- 2011 **Undergraduate Teaching Assistant**, *UCLouvain*, Junior teaching assistant for the course FSAB1104: Numerical Methods.

Languages

- French Mother Tongue
- English Fluent
- Spanish Fluent
- Dutch Fluent
- Italian Intermediate

Computer skills

Programming Python, C++
Statistics R, SAS

Misc. Matlab, Git
Specific. Pytorch, Tensorflow, Keras

Reviewer

- Since 2022 **TMLR**.
Since 2021 **NeurIPS, ICLR, ICML, AISTATS**.
Since 2021 **International Conference on Machine Learning, Optimization, and Data Science, LOD**.
Since 2020 **Transactions on Neural Networks and Learning Systems, IEEE**.
Since 2020 **Artificial Intelligence Review, Springer-Nature**.
Since 2019 **Machine Learning for Healthcare (ML4H), NeurIPS workshop**.
Since 2018 **Bioinformatics, Oxford Academic**.

Gap Year 2015-2016

2015-2016 I traveled for 13 months backpacking around South America. I spent most of my time volunteering in NGO's, toured with a circus as a performer and discovered the continent and its culture. I also took the advantage of the opportunity to learn Spanish.

Interests

- Arts and Technology I spend most of my free time working on projects linking arts, technology and architecture. This includes digital poems generators, making a piano that serves cocktails based on the mood of what you played or the design of virtual reality experiences.
- Music I'm a huge fan of music. I play jazz guitar and love tweaking with synthesizers. Check out my latest project on electronic music for fridges : *Wagner & Faust* on Spotify.
- Oldtimer I am the happy owner of a 1977 VW T2 bay window that I use to tour around Europe. In the process of converting it into an electric powered vehicle.
- Festivals I helped organizing several festivals. Among them, a two weeks jazz festival: openjazz.be.
- Scouts I was a scout leader for 3 years, taking care of teenagers from 12 to 16 years old.