

Théo Verhelst - Résumé

Date of birth	31/08/1996
Nationality	Belgian
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Links	LinkedIn – Scholar – ResearchGate GitHub – personnal webpage



Summary

Researcher in causal machine learning, autonomous and continuously learning. PhD in computer science on causal inference and machine learning for customer churn prediction. Looking to apply my experience to new and exciting problems in innovative ways. Strong experience of programming and team work.

Education

2020 – 2024

PhD in Computer Science at the Machine Learning Group, Université Libre de Bruxelles (ULB)

PhD thesis: *Causal and predictive modeling of customer churn: lessons learned from empirical and theoretical research* [[PDF](#)]

Supervisor: Prof. Gianluca Bontempi

Presented in January 2024

2018 – 2019

2nd year of Master in Computer Science at ULB

Master thesis: *Churn Prediction and Causal Analysis on Telecom Customer Data* [[PDF](#)]

Supervisor: Prof. Gianluca Bontempi

Raymond Devillers award for best master thesis

Average mark: 18.2 / 20, Grande distinction

2017 – 2018

1st year of Master in Artificial Intelligence at Southampton University, Erasmus Programme

Average mark: 16.4 / 20

2014 – 2017

Bachelor in Computer Science at ULB

Bachelor thesis: *Pitch Shifting of Music Signals*

Average mark: 15.65 / 20, with Grande distinction

Employment history

2024 (upcoming)

Postdoc at the Machine Learning Group (project TRAIL – ARIAC), funded by the Wallonia Region project [digitalwallonia4.ai](#).

2020 – 2024

PhD student at the Machine Learning Group (project [Machu-Picchu](#)), in collaboration with Orange Belgium, funded by Innoviris.

Research topic: Causal machine learning for customer churn prevention in the telecommunication industry.

2019 – 2020

Researcher at Machine Learning Group (project [DefeatFraud](#)), in collaboration with Atos / Worlwide, funded by Innoviris.

Research topic: transfer learning for credit card fraud detection.

2018

Back-end programmer at Open Summer of Code 2018.

Project: Development of a visualization tool for open parking data ([2018.summerofcode.be/openparking](#)).

Languages

French First language

English Fluent

Skills

Machine Learning Churn prediction, supervised/unsupervised learning, feature selection, clustering, parallel computing (Spark), GPU programming, deep learning, optimization

Causal analysis Uplift modeling, causal effect inference, counterfactual identification, causal graph inference (causal discovery), do-calculus

Programming Python (sklearn, tensorflow, pytorch), R, C++, C, Java, Bash, Clojure, Matlab

Web Development HTML5, CSS3 (SASS), JavaScript (Jquery), SQL, PHP, Bootstrap, Django

Others Agile development, GNU/Linux system administration, assembly language, \LaTeX

Publications

- Verhelst, Théo, Olivier Caelen, et al. (2020). “Understanding Telecom Customer Churn with Machine Learning: From Prediction to Causal Inference”. In: *Artificial Intelligence and Machine Learning*. Ed. by Bart Bogaerts et al. ISSN: 16130073. Springer International Publishing, pp. 182–200. ISBN: 978-3-030-65154-1.

- Lebichot, Bertrand et al. (2021). “Transfer Learning Strategies for Credit Card Fraud Detection”. In: *IEEE Access* 9, pp. 114754–114766. doi: [10.1109/ACCESS.2021.3104472](https://doi.org/10.1109/ACCESS.2021.3104472).
- Verhelst, Théo, Jeevan Shrestha, et al. (2021). “Predicting reach to find persuadable customers: Improving uplift models for churn prevention”. In: *Discovery science*. Ed. by Carlos Soares and Luis Torgo. Cham: Springer International Publishing, pp. 44–54. ISBN: 978-3-030-88942-5.
- Verhelst, Théo, Denis Mercier, Jeevan Shrestha, and Gianluca Bontempi (2023a). “A churn prediction dataset from the telecom sector: a new benchmark for uplift modeling”. In: *ECML PKDD 2023 Workshops - Workshop on Uplift Modeling and Causal Machine Learning for Operational Decision Making*.
- Verhelst, Théo, Denis Mercier, Jeevan Shrestha, and Gianluca Bontempi (Mar. 2023b). “Partial counterfactual identification and uplift modeling: theoretical results and real-world assessment”. en. In: *Machine Learning*. ISSN: 0885-6125, 1573-0565. doi: [10.1007/s10994-023-06317-w](https://doi.org/10.1007/s10994-023-06317-w). URL: <https://link.springer.com/10.1007/s10994-023-06317-w> (visited on 05/03/2023).

Presentations

- 31st Benelux Conference on Artificial Intelligence (BNAIC 2019) and the 28th Belgian Dutch Conference on Machine Learning (Benelearn 2019), 6th to 8th of November 2019, Brussels, Belgium.
- 24th International Conference on Discovery Science (DS 2021), 11th to 13th of October 2021, online (planned to be in Halifax, Canada).
- Fundamental Challenges in Causality, 9th to 12th of May 2023, Grenoble, France (poster presentation).
- ECML PKDD 2023 - Workshop on Uplift Modeling and Causal Machine Learning for Operational Decision Making, 18th to 22nd of September 2023, Turin, Italy.

Other interests

- Physics, astronomy, astrophysics, electronics, mathematics
- Martial arts, music