**Antoine LEDENT**

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## Summary Statement

Antoine Ledent is a tenure-track Assistant Professor in Computer Science at SCIS with expertise spanning Recommender Systems, Deep Learning, Statistical Learning Theory, Computer Vision and Stochastic Analysis.

## Education

PhD, University of Luxembourg, Luxembourg, 2017

Bachelor of Arts, University of Cambridge, Great Britain, 2013

Master of Mathematics, University of Cambridge, Great Britain, 2013

## Skill Set

Probability, Statistical Learning Theory, Machine Learning, Data Science, Stochastic Analysis.

## Academic Appointments

Assistant Professor of Computer Science, School of Computing and Information Systems, SMU, Jul 2022 - Present

## Awards and Honors

Expert Reviewer, Transactions on Machine Learning Research (TMLR), 2024

Certificate of Excellence in Reviewing, ACM SIGKDD Conference on Knowledge Discovery and Data mining, 2023

Outstanding Reviewer Award (top 8-10 percent), International Conference on Machine Learning, 2022, 2021

Highlighted Reviewer (top 8-10 percent), International Conference on Learning Representations (ICLR), 2022

Top Reviewer, Advances in Neural Information Processing (NeurIPS), 2022

Top 25 percent of Reviewers, Association for the Advancement of Artificial Intelligence (AAAI), 2021

Best reviewer award (top 10 percent), Advances in Neural Information Processing (NeurIPS), 2020

### Professional Memberships

Member, Institute of Electrical and Electronics Engineers, 2024

Member, Association for the Advancement of Artificial Intelligence (AAAI), 2020

## RESEARCH

### Research Interests

Machine Learning, Artificial Intelligence, Statistical Learning Theory, Matrix Completion, Recommender Systems, Deep Learning Theory, Computer Vision, Time Series Analysis, Stochastic Analysis.

### Publications

Journal Articles [Refereed]

Context-Aware REpresentation: Jointly learning item features and selection from triplets, by ALVES, Rodrigo; LEDENT, Antoine. (2024). *IEEE Transactions on Neural Networks and Learning Systems,* 1-10. https://doi.org/10.1109/TNNLS.2024.3383246 (Advance Online)

Recommendations with minimum exposure guarantees: A post-processing framework, by LOPES, Ramon; ALVES, Rodrigo; LEDENT, Antoine; SANTOS, Rodrygo L. T.; KLOFT, Marius. (2024). *Expert Systems with Applications, 236* 1-9. https://doi.org/10.1016/j.eswa.2023.121164 (Published)

Uncertainty-Adjusted Recommendation via Matrix Factorization With Weighted Losses, by ALVES, Rodrigo; LEDENT, Antoine; KLOFT, Marius. (2023). *IEEE Transactions on Neural Networks and Learning Systems,* 1-14. https://doi.org/10.1109/TNNLS.2023.3288769 (Advance Online)

Orthogonal Inductive Matrix Completion, by LEDENT, Antoine; ALVES, Rodrigo; KLOFT, Marius. (2023). *IEEE Transactions on Neural Networks and Learning Systems, 34* (5), 1-12. https://doi.org/10.1109/TNNLS.2021.3106155 (Published)

Conference Proceedings

Unraveling the dynamics of stable and curious audiences in web systems, by ALVES, Rodrigo; LEDENT, Antoine; ASSUNÇÃO, Renato; VAZ-DE-MELO, Pedro; KLOFT, Marius. (2024.0). *WWW '24: Proceedings of the ACM Web Conference 2024, Singapore, May 13-17,* (pp. 2464-2475) New York: ACM. https://doi.org/10.1145/3589334.36454 (Published)

Interpretable tensor fusion , by VARSHNEYA, Saurabh; LEDENT, Antoine; LIZNERSKI, Philipp; BALINSKYY, Andriy; MEHTA, Purvanshi; MUSTAFA, Waleed; KLOFT, Marius. (2024.0). *Proceedings of the Thirty-Third International Joint Conference on Artificial Intelligence, Jeju, South Korea, 2024 August 3-9 ,* (pp. 5037-5045) Jeju: IJCAI. https://doi.org/10.24963/ijcai.2024/557 (Published)

Generalization analysis of deep nonlinear matrix completion, by LEDENT, Antoine; ALVES, Rodrigo. (2024.0). *Proceedings of the 41st International Conference on Machine Learning, Vienna, Austria 2024 July 21-27 ,* (pp. 26290-26360) Vienna: PMLR. https://proceedings.mlr.press/v235/ledent24a.html (Published)

Non-vacuous generalization bounds for adversarial risk in stochastic neural networks, by WALEED, Mustafa; PHILIPP, Liznerski; ANTOINE, Ledent; DENNIS, Wagner; PUYU, Wang; MARIUS, Kloft. (2024.0). *Proceedings of The 27th International Conference on Artificial Intelligence and Statistics, Valencia, Spain, 2024 May 2-4,* (pp. 4528-4536) New York: ML Research Press. (Published)

Uncertainty-adjusted inductive matrix completion with Graph Neural Networks, by KASALICKY, Petr; LEDENT, Antoine; ALVES, Rodrigo. (2023.0). *RecSys '23: Proceedings of the 17th ACM Conference on*

*Recommender Systems, Singapore, September 18-22,* (pp. 1169-1174) New York: ACM. https://doi.org/10.1145/3604915.3610654 (Published)

Generalization bounds for inductive matrix completion in low-noise settings, by LEDENT, Antoine; ALVES, Rodrigo; LEI, Yunwen; GUERMEUR, Yann; KLOFT, Marius. (2023.0). *Proceedings of the 36th AAAI Conference on Artificial Intelligence, Washington, 2023 February 7-14,* (pp. 8447-8455) Washington: AAAI Press. https://doi.org/10.1609/aaai.v37i7.26018 (Published)

Fine-grained generalization analysis of inductive matrix completion, by LEDENT, Antoine; ALVES, RODRIGO; LEI, Yunwen; KLOFT, Marius. (2021.0). *Proceedings of the 35th Conference on Neural Information Processing System (NeurIPS 2021), Virtual Conference, December 6-12,* (pp. 25540-25552) Virtual Conference: https://proceedings.neurips.cc/paper/2021/hash/d6428eecbe0f7dff83fc607c5044b2b9-Abstract.html (Published)

Beyond smoothness : Incorporating low-rank analysis into nonparametric density estimation, by VANDERMEULEN, Rob; LEDENT, Antoine. (2021.0). *Advances in Neural Information Processing Systems (NeurIPS 2021): December 7-10, Virtual: Proceedings,* (pp. 12180-12193) San Diego: NIPs Foundation. https://arxiv.org/abs/2204.00930 (Published)

Burst-induced Multi-Armed Bandit for learning recommendation, by ALVES, Rodrigo; LEDENT, Antoine; KLOFT, Marius. (2021.0). *RecSys '21: Proceedings of the 15th ACM Conference on Recommender Systems, September 27 - October 1, Amsterdam,* (pp. 292-301) New York: ACM. https://doi.org/10.1145/3460231.3474250 (Published)

Fine-grained analysis of structured output prediction, by MUSTAFA, Waleed; LEI, Yunwen; LEDENT, Antoine; and KLOFT, Marius. (2021.0). *Proceedings of the Thirtieth International Joint Conference on Artificial Intelligence, Montreal, 2021 August 19-27,* (pp. 2841-2847 ) International Joint Conferences on Artificial Intelligence: International Joint Conferences on Artificial Intelligence. https://doi.org/10.24963/ijcai.2021/391 (Published)

Learning interpretable concept groups in CNNs, by VARSHNEYA, Saurabh; LEDENT, Antoine; VANDERMEULEN, Rob; LEI, Yunwen; ENDERS, Matthias; BORTH, Damian; KLOFT, Marius. (2021.0). *Proceedings of the Thirtieth International Joint Conference on Artificial Intelligence, Montreal, 2021 August 19-27,* (pp. 1061-1067) Montreal, Canada: IJCAI. https://doi.org/10.24963/ijcai.2021/147 (Published)

An empirical study of the discreteness prior in low-rank matrix completion, by ALVES, Rodrigo; LEDENT, Antoine; ASSUNÇÃO, Renato; and KLOFT, Marius. (2021.0). *Proceedings of the NeurIPS 2020 Workshop on Pre-registration in Machine Learning, Virtual Conference, December 13-20,* (pp. 111-125) Virtual Conference: https://proceedings.mlr.press/v148/alves21a.html (Published)

Model uncertainty guides visual object tracking, by ZHOU, Lijun; LEDENT, Antoine; HU, Qintao; LIU, Ting; ZHANG, Jianlin; KLOFT, Marius . (2021.0). *Proceedings of the 35th AAAI Conference on Artificial Intelligence 2021: February 2-9, Virtual,* (pp. 3581-3589) Paolo Alto, CA: AAAI Press. (Published)

Fine-grained generalization analysis of vector-valued learning, by WU, Liang; LEDENT, Antoine; LEI, Yunwen; KLOFT, Marius. (2021.0). *Proceedings of the 35th AAAI Conference on Artificial Intelligence: February 2-9, Virtual,* (pp. 10338-10346) Paolo Alto, CA: AAAI Press. https://ojs.aaai.org/index.php/AAAI/article/view/17238 (Published)

Norm-based generalisation bounds for deep multi-class convolutional neural networks, by LEDENT, Antoine; MUSTAFA, Waleed; LEI, Yunwen; KLOFT, Marius. (2021.0). *Proceedings of the 35th AAAI Conference on Artificial Intelligence 2021: February 2-9, Virtual,* (pp. 8279-8287) Palo Alto, CA: AAAI Press. https://ojs.aaai.org/index.php/AAAI/article/view/17007 (Published)

Sharper generalisation bounds for pairwise learning, by LEI, Yunwen; LEDENT, Antoine; KLOFT, Marius. (2020.0). *Proceedings of the 35th Conference on Neural Information Processing System (NeurIPS 2020), Virtual Conference, December 6-12,* (pp. 21236-21246) Virtual Conference: (Published)

Conference Papers

Improved generalisation bounds for deep learning through L∞ covering numbers, by LEDENT, Antoine; LEI, Yunwen; KLOFT, Marius. (2019.0). *NeurIPS 2019 Workshop on Machine Learning with Guarantees, Vancouver, Canada, 14 December,* Vancouver, Canada.

https://sites.google.com/view/mlwithguarantees/accepted-papers (Published)

### Research Grants

Singapore Management University

Implicit feedback as side information in MF-based Recommender Systems, SMU Internal Grant, Ministry of Education (MOE) Tier 1 , PI (Project Level): Antoine LEDENT, 2022, S$100,000

Other Institutions

The Data-dependency Gap: A New Problem in the Learning Theory of Convolutional Neural Networks, SFPP2298, DFG (National Research Institute of Germany) KLOFT, Marius, KLOFT, Marius, EUR297,100

## TEACHING

### Teaching Areas

Machine Learning, Data Science, Statistics, Linear Algebra.

### Courses Taught

Singapore Management University

Undergraduate Programmes :

- Introduction to Artificial Intelligence
- Linear Algebra for Computing Applications
- Principles of Machine Learning

Postgraduate Research Programmes :

- Empirical Research Project 1

## THESES AND DISSERTATIONS

### Theses and Dissertations Assessed

Other Institutions

Co Supervisor, "Generalization analysis for contrastive learning using deep neural networks", Thesis by Hieu Nong Minh, Nanyang Technological University, 2024

Co Supervisor, "Orthogonal Inductive Tensor Completion (OTIC).", Dissertation by Justus Will, Bachelor's Thesis in Computer Science. , TU Kaiserslautern, 2020

Co Supervisor, "Inducing Interpretability in Convolutional Neural Networks via Regularization Methods", Dissertation by Saurabh Varshneya, Masters' degree in Computer Science. , TU Kaiserslautern, 2019

Co Supervisor, "Interpretable Multimodal Deep Learning.", Dissertation by Purvanshi Mehta, Internship report, TU Kaiserslautern, 2019

## UNIVERSITY SERVICE

### Singapore Management University

Interviewer for candidates to our undergraduate CS programme, CS Admissions Committee (SCIS), Mar 2024 - Apr 2024

Interviewer for candidates to our undergraduate programme, CS Admissions Committee (SCIS), Mar 2023 - Apr 2023

## EXTERNAL SERVICE – PROFESSIONAL

Action Editor, Transactions on Machine Learning Research (TMLR), 2024 - Present

Area Chair, Advances in Neural Information Processing, 2024 - Present

Reviewer Journal Article, Transactions of Machine Learning Research, 2023 - Present

Reviewer Journal Article, Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2023

Reviewer Conference Paper, International Joint Conference on Artificial Intelligence (IJCAI), 2023

Reviewer Conference Paper, ACM SIGKDD conference on Knowledge Discovery and Data mining, 2023

Reviewer Journal Article, Transactions on Neural Networks and Learning Systems, 2022

Reviewer Journal Article, International Journal of Information Technology and Decision Making, 2022 - 2023

Reviewer Conference Paper, International Conference on Learning Representations (ICLR), 2022 - Present

Reviewer Journal Article, Transactions of Signal Processing , 2021 - 2023

Reviewer Conference Paper, Advances in Neural Information Processing (NeurIPS) , 2020 - 2023

Reviewer Conference Paper, International Conference on Machine Learning (ICML), 2020 - Present

Reviewer Conference Paper, European Conference on Machine Learning (ECML), 2020

Committee Member, Association for the Advancement of Artificial Intelligence (AAAI), 2020 - Present

Reviewer Journal Article, Neural Networks, 2019

Reviewer Conference Paper, Knowledge Discovery in Databases (KDD), 2019

Reviewer Conference Paper, Conference on Artificial Intelligence and Statistics (AiStats), 2019