PASCALE GOURDEAU

Postdoctoral Research Fellow
pascale.gourdeau@vectorinstitute.ai

RESEARCH INTERESTS

Learning theory, robustness, trustworthy machine learning

EDUCATION & ACADEMIC EMPLOYMENT

Postdoctoral Research Fellow *October 2023 – Present*
Vector Institute & University of Toronto
Supervisors: Nicolas Papernot and Shai Ben-David

DPhil (PhD) in Computer Science *2017 – 2023*
University of Oxford
Supervisors: James Worrell, Varun Kanade and Marta Kwiatkowska
Thesis title: *Sample Complexity of Robust Learning against Evasion Attacks*
Medical leaves: October 2019 – April 2020; October 2020 – April 2021

M.Sc. in Computer Science *2016 – 2017*
McGill University, Montreal
Supervisors: Prakash Panangaden and Doina Precup
Thesis Title: *Bisimulation Pseudometrics for Weighted Finite Automata*
Overall GPA: 4/4

B.Sc. in Computer Science (Honours), Minor in Mathematics *2012 – 2016*
McGill University, Montreal
Overall GPA: 3.94/4

PUBLICATIONS

Journal Publications

1. **Pascale Gourdeau**, Varun Kanade, Marta Kwiatkowska, and James Worrell, "On the hardness of robust classification," in *Journal of Machine Learning Research (JMLR)*, 2021.
2. Borja Balle, **Pascale Gourdeau**, and Prakash Panangaden, "Bisimulation metrics and norms for real-weighted automata," in *Information and Computation*, 2020.

Conference Publications and Preprints

($\alpha\beta$ indicates alphabetical order)

1. ($\alpha\beta$) **Pascale Gourdeau**, Tosca Lechner, and Ruth Urner, "On the computability of robust PAC learning," in *Conference on Learning Theory (COLT)*, 2024.
2. **Pascale Gourdeau**, Varun Kanade, Marta Kwiatkowska, and James Worrell, "When are local queries useful for robust learning?," in *36th Conference on Neural Information Processing Systems (NeurIPS)*, 2022.
3. **Pascale Gourdeau**, Varun Kanade, Marta Kwiatkowska, and James Worrell, "Sample complexity bounds for robustly learning decision lists against evasion attacks," in *International Joint Conference on Artificial Intelligence (IJCAI)*, 2022. [long presentation]
4. **Pascale Gourdeau**, Varun Kanade, Marta Kwiatkowska, and James Worrell, "On the hardness of robust classification," in *33rd Conference on Neural Information Processing Systems (NeurIPS)*, 2019. [spotlight]

5. Borja Balle, **Pascale Gourdeau**, and Prakash Panangaden, "Bisimulation metrics for weighted automata," in *44th International Colloquium on Automata, Languages, and Programming (ICALP), Schloss Dagstuhl-Leibniz- Zentrum fuer Informatik*, 2017.

6. **Pascale Gourdeau**, Lara Kanbar, Wissam Shalish, Guilherme Sant'Anna, Robert Kearney, and Doina Precup, "Feature selection and oversampling in analysis of clinical data for extubation readiness in extreme preterm infants," in *2015 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, pp. 4427–4430, IEEE, 2015.

Workshops

1. **Pascale Gourdeau**, Varun Kanade, Marta Kwiatkowska, and James Worrell, "When are local queries useful for robust learning?," in *Women in Machine Learning Workshop (WiML)*, concurrent with NeurIPS, 2022. [oral presentation]

2. **Pascale Gourdeau**, Varun Kanade, Marta Kwiatkowska, and James Worrell, "On the hardness of robust classification," in *Women in Machine Learning Workshop (WiML)*, concurrent with NeurIPS, 2019.

3. **Pascale Gourdeau**, Varun Kanade, Marta Kwiatkowska, and James Worrell, "On the hardness of robust classification," in *Machine Learning with Guarantees Workshop*, concurrent with NeurIPS, 2019.

EMPLOYMENT AND TEACHING EXPERIENCE

Trinity College, University of Oxford *December 2022*
Undergraduate Admissions Interviewer *Oxford, UK*

· Underwent Oxford admissions and interview training
· Assisted in reviewing candidates' applications, and interviewing and recommending applicants

Wadham College, University of Oxford *2022 – 2023*
Course Tutor (grading assignments, reviewing them one-on-one 1h/week) *Oxford, UK*

· Probability & Computing: Winter 2023
· Computational Learning Theory: Fall 2022

Department of Computer Science, University of Oxford *2018 – 2023*
Course Teacher and Marker (grading assignments, reviewing them w/ students 1h/week) *Oxford, UK*

· Computational Learning Theory: Fall 2021, Fall 2022
· Machine Learning: Fall 2018

Department of Computer Science, McGill University *2016 – 2017*
Teaching Assistant (grading assignments and exams, holding office hours) *Montreal, Canada*

· Programming Languages and Paradigms: Winter 2017
· Logic and Computation: Fall 2016
· Foundations of Programming: Summer 2016

Reasoning and Learning Lab[1], McGill University *Summers 2014 and 2015*
Research Assistant *Montreal, Canada*

· Summer 2015: automata theory research. Themes: minimization and approximation algorithms for automata, bisimulation metrics. Supervised by Prakash Panangaden.
· Summer 2014: medical application of machine learning. Project: using machine learning classification algorithms to predict extubation readiness in exteme preterm infants. Supervised by Doina Precup.

[1]Now joint with Mila.

DISTINCTIONS AND AWARDS

Natural Sciences and Engineering Research Council Postdoctoral Fellowship *2023*
Two years of funding for postdoctoral research at the Vector Institute

Graduate Scholarship *2019, 2022*
Awarded by Trinity College, Oxford for outstanding graduate research

Clarendon Scholarship *2017*
Three and a half years of funding (tuition fees and living expenses) for the DPhil in Computer Science at the University of Oxford

Natural Sciences and Engineering Research Council Postgraduate Doctoral Scholarship *2017*
Three years of funding for the DPhil in Computer Science at the University of Oxford

Natural Sciences and Engineering Research Council Graduate Scholarship *2016*
Funding for the M.Sc in Computer Science at McGill University

Natural Sciences and Engineering Research Council Undergraduate Student Research Award *2015*
Summer research funding in the Reasoning and Learning Lab at McGill University

Science Undergraduate Research Award *2014*
Summer research funding in the Reasoning and Learning Lab at McGill University

Full scholarship to attend Lester B. Pearson UWC *2010*
International boarding school network (United World Colleges) working towards peace and a sustainable future. Programme: International Baccalaureate (2 years)

INVITED TALKS

When are Local Queries Useful for Robust Learning?

· University of Waterloo

Sample Complexity Bounds for Robust Classification

· University of British Columbia; University of Victoria; Princeton University; Université Laval

On the Hardness of Robust Classification

· Mila, McGill/Université de Montréal; IRIF, Université de Paris; LabRI, Université de Bordeaux

Bisimulation Metrics for Weighted Finite Automata

· University of Warwick; University College London; University of Oxford

PROFESSIONAL SERVICE

Chairmanship: Area Chair, *WiML NeurIPS Workshop 2022*; Session Chair, *SatML 2024*

Conference and Workshop Reviewing: *COLT 2019, 2023 – 2024*; *NeurIPS 2021 – 2023*; *ICLR 2023*; *SatML 2024*; *WiML Workshop 2019*

Committees: Adjudication for the *Vector AI Masters Scholarship*