# PASCALE GOURDEAU

## 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** *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)** *2012 – 2016*
McGill University, Montreal
Minor in Mathematics
Overall GPA: 3.94/4

## 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 – Present*
*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 – Present*
*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.

## 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

**Anita Borg Memorial Scholarship** *2015*
Scholarship from Google recognizing women's contribution and leadership in Computer Science

**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)

## 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

1. **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.

[1]Now joint with Mila.

2. **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]

3. **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]

4. 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.

5. **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.

## INVITED TALKS

**Sample Complexity Bounds for Robust Classification**

· University of British Columbia
· University of Victoria, British Columbia
· University of Princeton
· Université Laval, Quebec City

**On the Hardness of Robust Classification**

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

**Bisimulation Metrics for Weighted Finite Automata**

· University of Warwick
· University College London
· Verification seminar, University of Oxford

## PROFESSIONAL SERVICE

**Chairmanship:** Area Chair, *Women in Machine Learning Workshop 2022*

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