

# Neil G. Marchant

✉ ngmarchant@gmail.com  
🌐 www.ngmarchant.net  
🌐 ngmarchant  
🌐 ngmarchant  
🆔 0000-0001-5713-4235  
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## Academic and research experience

- Feb 2021–  
now **Postdoctoral Research Fellow**, *University of Melbourne*, Melbourne.  
Advisor: Benjamin Rubinstein
- Aug 2017–  
Feb 2018 **Research Intern**, *Australian Bureau of Statistics*, Melbourne/Canberra.  
Project: *Evaluating feasibility of Bayesian entity resolution*  
Mentor: Daniel Elazar
- Aug 2015–  
Nov 2015 **Research Intern**, *IBM Research Australia*, Melbourne.  
Project: *Flood modelling for emergency decision making*  
Mentor: Laura Rusu

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## Education

- 2016–2021 **PhD in Computer Science**, *University of Melbourne*.  
Thesis: Statistical Approaches for Entity Resolution Under Uncertainty  
Advisors: Ben Rubinstein and Rebecca Steorts (Duke)
- 2013–2014 **MSc in Physics**, *University of Melbourne*.  
Thesis: Vortex Lattices in Quasi-Two-Dimensional Dipolar Bose-Einstein Condensates  
Advisor: Andy Martin
- 2009–2011 **BSc in Physics**, *University of Melbourne*.

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## Research interests

- Adversarial machine learning
- Differential privacy
- Sampling and estimation
- Data integration
- Bayesian modeling and inference

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## Publications

### Conference papers and journal articles

- 2023 Zhuoqun Huang, **Neil G. Marchant**, Keane Lucas, Lujo Bauer, Olga Ohrimenko, and Benjamin I. P. Rubinstein. 2023a. “RS-Del: Edit Distance Robustness Certificates for Sequence Classifiers via Randomized Deletion”. In: *Advances in Neural Information Processing Systems*, accepted.
- Neil G. Marchant**, Benjamin I. P. Rubinstein, and Rebecca C. Steorts. Jan. 2023. “Bayesian Graphical Entity Resolution using Exchangeable Random Partition Priors”. In: *Journal of Survey Statistics and Methodology* 11.3, pp. 569–596.
- 2022 **Neil G. Marchant**, Benjamin I. P. Rubinstein, and Scott Alfeld. 2022. “Hard to Forget: Poisoning Attacks on Certified Machine Unlearning”. In: *Proceedings of the AAAI Conference on Artificial Intelligence*. Vol. 36. 7, pp. 7691–7700.
- 2021 **Neil G. Marchant**, Andee Kaplan, Daniel N. Elazar, Benjamin I. P. Rubinstein, and Rebecca C. Steorts. 2021a. “d-blink: Distributed End-to-End Bayesian Entity Reso-

lution". In: *Journal of Computational and Graphical Statistics* 30.2, pp. 406–421.

**Neil G. Marchant** and Benjamin I. P. Rubinstein. 2021b. "Needle in a Haystack: Label-Efficient Evaluation under Extreme Class Imbalance". In: *Proceedings of the 27th ACM SIGKDD Conference on Knowledge Discovery & Data Mining*, pp. 1180–1190.

2017 **Neil G. Marchant** and Benjamin I. P. Rubinstein. Aug. 2017. "In Search of an Entity Resolution OASIS: Optimal Asymptotic Sequential Importance Sampling". In: *Proceedings of the VLDB Endowment* 10.11, pp. 1322–1333.

A. M. Martin, **N. G. Marchant**, D. H. J. O'Dell, and N. G. Parker. Feb. 2017. "Vortices and vortex lattices in quantum ferrofluids". In: *Journal of Physics: Condensed Matter* 29.10, p. 103004.

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## Talks

2022 **Neil G. Marchant**. July 2022. "Statistical Approaches for Entity Resolution Under Uncertainty". ISBA 2022 World Meeting (invited). Montréal, Canada.

**Neil G. Marchant**, Benjamin I. P. Rubinstein, and Scott Alfeld. Feb. 2022. "Hard to Forget: Poisoning Attacks on Certified Machine Unlearning". AAAI'22 (contributed). Virtual Event.

2021 **Neil G. Marchant** and Benjamin I. P. Rubinstein. Aug. 2021. "Needle in a Haystack: Label-Efficient Evaluation under Extreme Class Imbalance". KDD'21 (contributed). Virtual Event.

2019 **Neil G. Marchant**. Sept. 2019. "Analysing Human Rights Abuses using Bayesian Entity Resolution". School of CIS Doctoral Colloquium (contributed). University of Melbourne, Australia.

**Neil G. Marchant**. Apr. 2019. "Analysing Human Rights Abuses using Bayesian Entity Resolution". MLBytes Seminar (invited). Duke University, USA.

**Neil G. Marchant**, Andee Kalpan, Daniel N. Elazar, Benjamin I. P. Rubinstein, and Rebecca C. Steorts. Aug. 2019. "Distributed Markov Chain Monte Carlo for Scalable Bayesian Entity Resolution". Conference on Current Trends in Survey Statistics (invited). Singapore.

2017 **Neil G. Marchant**. July 2017. "OASIS: An efficient evaluation method for entity resolution". School of CIS Doctoral Colloquium (contributed). University of Melbourne, Australia.

**Neil G. Marchant**. Oct. 2017. "Statistically efficient linkage validation". ACEMS-ABS Workshop (invited). Canberra, Australia.

**Neil G. Marchant** and Benjamin I. P. Rubinstein. July 2017. "In Search of an Entity Resolution OASIS: Optimal Asymptotic Sequential Importance Sampling". VLDB'17 (contributed). Munich, Germany.

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## Open-source software

2020– **comparator**, an R package for string similarity/distance comparisons.  
GitHub: ngmarchant/comparator · CRAN: comparator

2020– **clevr**, an R package for evaluating link prediction/clustering results.  
GitHub: cleanzr/clevr · CRAN: clevr

2019– **activeeval**, a Python package for pool-based active evaluation.  
GitHub: ngmarchant/activeeval

- 2019– **exchanger**, an R package for Bayesian entity resolution with exchangeable priors.  
GitHub: [cleanzr/exchanger](#)
- 2018– **dblink**, an Apache Spark package for distributed Bayesian entity resolution.  
GitHub: [cleanzr/dblink](#)

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## Funding

- 2017–2018 **Australian Bureau of Statistics**, *Research Contract*, AUD \$31k.  
Project: *Scaling up Bayesian record linkage*  
PI: Ben Rubinstein, co-investigator: Neil Marchant
- 2019 **University of Melbourne**, *MSE Conference Travel Scholarship*, AUD \$1500.
- 2016–2019 **Australian Government**, *PhD Research Training Program Scholarship*.
- 2017 **Google Australia**, *PhD Travel Scholarship*, AUD \$2500.
- 2011 **University of Melbourne**, *Melbourne Global Grant*, AUD \$2500.

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## Teaching

### University of Melbourne

- Sem 2, 2020 **Head Tutor & Guest Lecturer**, Statistical Machine Learning (graduate-level).  
Subject coordinator: Ben Rubinstein
- Sem 1, 2020 **Tutor**, Elements of Data Processing (undergraduate-level).  
Subject coordinator: Pauline Lin
- Sem 1, 2019 **Tutor**, Elements of Data Processing (undergraduate-level).  
Subject coordinator: James Bailey
- Sem 2, 2018 **Head Tutor**, Statistical Machine Learning (graduate-level).  
Subject coordinator: Ben Rubinstein
- 2015–2017 **Tutor**, Physics 1 & 2 (undergraduate-level).
- 2012–2015 **Laboratory Demonstrator**, Physics 1 & 2 (undergraduate-level).

### Melbourne Business School

- 2019 **Tutor**, Statistical Learning 2, Advanced Business Analytics (graduate-level).

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## Mentorship

- 2023– Maria Bulychev, MSc co-supervisor (with Benjamin Rubinstein)
- 2023– Maria Bulychev, Undergraduate research project co-supervisor (with Benjamin Rubinstein)
- 2021– Calvin Huang, PhD co-supervisor (with Olya Ohrimenko and Benjamin Rubinstein)

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## Academic Service

### Peer Review

- Reviewer NeurIPS'23, ICML'23, NeurIPS'22 (Top Reviewer), J Surv Stat Methodol, NeurIPS'21, ICML'21, AISTATS'21, ICML'20, ICML'19, NeurIPS'19
- Sub-reviewer IEEE S&P'22, ICML'18, ICML'17, NIPS'16, KDD'16

### Service to Department

- 2022 Reviewer of submissions for CIS Doctoral Colloquium

- 2017 Organising Committee Member, CIS DC, Treasurer, Venue Management and Proceedings
- 2016–2017 Executive Committee Member, CIS Postgraduate Group