Andrew Cropper
andrew.cropper@cs.ox.ac.uk

Research interests

Inductive logic programming, program induction, program synthesis

Academic employment

- Research Fellow, University of Oxford 2021 -
- Junior Research Fellow, Hertford College, University of Oxford 2018 -
- Research Assistant, University of Cambridge 2013

Education

- PhD Computer Science, Imperial College London 2018
- MSc Computer Science, University of Oxford 2011
- BSc Computer Science, Nottingham Trent University 2009

Awards and honours

- Best paper ILP 2019
- Best paper ILP 2018
- Best student paper ILP 2014

Fellowships, scholarships, and grants

- EPSRC kick-starter grant (£81k) 2021
- EPSRC early career fellowship (£1.4m) 2021
- Google cloud platform grant ($5k) 2019
- Hertford College junior research fellowship (£120k) 2018
- JSPS postdoctoral fellowship (*declined in favour of the JRF*) 2018
- National Institute of Informatics internship (£3k) 2014
- Syngenta fellowship (£30k) 2013
- BBSRC PhD studentship (£100k) 2013

Supervision

I am/was the primary supervisor of the following students/researchers:

Postdoc

- Céline Hocquette 2021 -

PhD/DPhil

- Rolf Morel 2023 (expected)

MSc

- John Wahlig 2021
- Brad Hunter 2021
- Rolf Morel 2018

BA

- Victor Vasiesiu 2022
- Bogdan Cretu 2022
- Cristian Dinu 2021, 2022
- Andrei Diaconu 2020
- Alastair Flynn 2020

Summer intern

- Joar Skalse (⟶ DPhil Oxford) 2018

External PhD examiner

- Lidia Contreras Ochando, Universitat Politècnica de València 2020

Teaching

- Introduction to Formal Proof, University of Oxford 2020
- Computational Logic, Stanford University (Oxford campus) 2019

Industrial employment

- Researcher, MFG Labs, Paris, France 2012 - 2013
- Software Engineer, Esendex, Nottingham 2009 - 2010
- Software Engineer, Counter Solutions, Derby 2007 - 2008

Research visits

- MIT, Josh Tenenbaum 2016, 2018, 2019
- KU Leuven, Sebastijan Dumančić 2019
- National Institute of Informatics, Tokyo, Japan, Katsumi Inoue 2014, 2015, 2017

Publications

Journals

1. C. Hocquette and **A. Cropper**. Learning programs with magic values. *Mach. Learn.*, 2023
2. **A. Cropper** and S. Dumancic. Inductive logic programming at 30: A new introduction. *J. Artif. Intell. Res.*, 74:765–850, 2022
3. **A. Cropper**, S. Dumančić, R. Evans, and S. H. Muggleton. Inductive logic programming at 30. *Mach. Learn.*, 111(1):147–172, 2022
4. **A. Cropper** and R. Morel. Learning programs by learning from failures. *Mach. Learn.*, 110(4):801–856, 2021
5. **A. Cropper** and S. Tourret. Logical reduction of metarules. *Mach. Learn.*, 109(7):1323–1369, 2020
6. **A. Cropper**, R. Evans, and M. Law. Inductive general game playing. *Mach. Learn.*, 109(7):1393–1434, 2020
7. **A. Cropper**, R. Morel, and S. H. Muggleton. Learning higher-order logic programs. *Mach. Learn.*, 109(7):1289–1322, 2020
8. **A. Cropper** and S. H. Muggleton. Learning efficient logic programs. *Mach. Learn.*, 108(7):1063–1083, 2019

Conferences

1. C. Hocquette and **A. Cropper**. Relational program synthesis with numerical reasoning. *AAAI*, 2023
2. **A. Cropper** and C. Hocquette. Learning logic programs by discovering where not to search. *AAAI*, 2023
3. **A. Cropper**. Learning logic programs though divide, constrain, and conquer. In *Thirty-Sixth AAAI Conference on Artificial Intelligence, AAAI 2022*, pages 6446–6453. AAAI Press, 2022
4. S. Dumancic, T. Guns, and **A. Cropper**. Knowledge refactoring for inductive program synthesis. In *Thirty-Fifth AAAI Conference on Artificial Intelligence, AAAI 2021*, pages 7271–7278. AAAI Press, 2021

5. **A. Cropper** and S. Dumančić. Learning large logic programs by going beyond entailment. In *Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence, IJCAI 2020*, pages 2073–2079. ijcai.org, 2020
6. **A. Cropper**, S. Dumančić, and S. H. Muggleton. Turning 30: New ideas in inductive logic programming. In *Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence, IJCAI 2020*, pages 4833–4839. ijcai.org, 2020
7. **A. Cropper**. Forgetting to learn logic programs. In *The Thirty-Fourth AAAI Conference on Artificial Intelligence, AAAI 2020*, pages 3676–3683. AAAI Press, 2020
8. **A. Cropper**, R. Morel, and S. H. Muggleton. Learning higher-order programs through predicate invention. In *The Thirty-Fourth AAAI Conference on Artificial Intelligence, AAAI 2020*, pages 13655–13658. AAAI Press, 2020
9. **A. Cropper**. Playgol: learning programs through play. In *Proceedings of the Twenty-Eighth International Joint Conference on Artificial Intelligence, IJCAI 2019*, pages 6074–6080. ijcai.org, 2019
10. S. Tourret and **A. Cropper**. SLD-resolution reduction of second-order horn fragments. In *Logics in Artificial Intelligence - 16th European Conference, JELIA 2019*, volume 11468 of *Lecture Notes in Computer Science*, pages 259–276. Springer, 2019
11. R. Morel, **A. Cropper**, and C. L. Ong. Typed meta-interpretive learning of logic programs. In *Logics in Artificial Intelligence - 16th European Conference, JELIA 2019*, volume 11468 of *Lecture Notes in Computer Science*, pages 198–213. Springer, 2019
12. **A. Cropper** and S. Tourret. Derivation reduction of metarules in meta-interpretive learning. In *Inductive Logic Programming - 28th International Conference, ILP 2018*, volume 11105 of *Lecture Notes in Computer Science*, pages 1–21. Springer, 2018
13. **A. Cropper** and S. H. Muggleton. Learning higher-order logic programs through abstraction and invention. In *Proceedings of the Twenty-Fifth International Joint Conference on Artificial Intelligence, IJCAI 2016*, pages 1418–1424. IJCAI/AAAI Press, 2016
14. **A. Cropper**. Logic-based inductive synthesis of efficient programs. In *Proceedings of the Twenty-Fifth International Joint Conference on Artificial Intelligence, IJCAI 2016*, pages 3980–3981. IJCAI/AAAI Press, 2016
15. **A. Cropper** and S. H. Muggleton. Learning efficient logical robot strategies involving composable objects. In *Proceedings of the Twenty-Fourth International Joint Conference on Artificial Intelligence, IJCAI 2015*, pages 3423–3429. AAAI Press, 2015
16. **A. Cropper**, A. Tamaddoni-Nezhad, and S. H. Muggleton. Meta-interpretive learning of data transformation programs. In *Inductive Logic Programming - 25th International Conference, ILP 2015*, volume 9575 of *Lecture Notes in Computer Science*, pages 46–59. Springer, 2015
17. C. Farquhar, G. Grov, **A. Cropper**, S. Muggleton, and A. Bundy. Typed meta-interpretive learning for proof strategies. In *Late Breaking Papers of the 25th International Conference on Inductive Logic Programming, 2015.*, volume 1636 of *CEUR Workshop Proceedings*, pages 17–32. CEUR-WS.org, 2015
18. **A. Cropper**. Learning efficient logic programs. In *Proceedings of the Twenty-Fourth International Joint Conference on Artificial Intelligence, IJCAI 2015*, pages 4359–4360. AAAI Press, 2015
19. **A. Cropper** and S. H. Muggleton. Can predicate invention compensate for incomplete background knowledge? In *Thirteenth Scandinavian Conference on Artificial Intelligence - SCAI 2015*, volume 278 of *Frontiers in Artificial Intelligence and Applications*, pages 27–36. IOS Press, 2015
20. **A. Cropper** and S. H. Muggleton. Logical minimisation of meta-rules within meta-interpretive learning. In *Inductive Logic Programming - 24th International Conference, ILP 2014*, volume 9046 of *Lecture Notes in Computer Science*, pages 62–75. Springer, 2014

Service

Tutorials

- Inductive logic programming: an introduction and recent advances — AAAI 2023

Organisation

- Co-organiser Dagstuhl seminar *Approaches and Applications of Inductive Programming* — 2021

Senior program committee

- IJCAI 2021

Program committee

- IJCAI 2019, 2020, 2021, 2022
- AAAI 2020, 2021, 2022, 2023
- ILP 2020, 2021, 2022
- KR 2021
- ECAI 2020

Reviewer

- Machine Learning journal 2020, 2021, 2022
- POPL 2020
- StarAI 2020

Department service

- PhD/DPhil admissions 2022

College service

- Undergraduate admissions, Hertford College 2021, 2022

Outreach

- UNIQ summer school, University of Oxford 2021
- Bebras Computing Challenge, University of Oxford 2019

Selected talks

- Learning programs by learning from failures (*journal track*) AAAI23
- The automatic computer scientist, University of South Carolina 2022
- Learning higher-order logic programs, LMU Munich 2021
- Inductive logic programming, UC San Diego 2021
- Learning programs by learning from failures, Potsdam 2021
- Learning programs by learning from failures, MIT 2020
- Inductive general game playing, KU Leuven 2019
- Playgol: learning programs through play, KU Leuven 2019
- Learning higher-order logic programs, KU Leuven 2019
- Inductive general game playing, MIT 2019
- Playgol: learning programs through play, MIT 2019
- Learning efficient logic programs, MIT 2018
- Logic-based learning of programs, UC Berkeley 2016