Andrew Cropper

andrew.cropper@cs.ox.ac.uk

Research interests

Inductive logic programming, program induction, program synthesis

Academic employment

- Junior Research Fellow (JRF), Hertford College, University of Oxford 2018 -
- Research Assistant, University of Cambridge 2013

Education

- PhD Computer Science, Imperial College London 2013 - 2018
  Supervisor: Professor Stephen Muggleton
- MSc Computer Science, University of Oxford 2010 - 2011
- BSc Computer Science, Nottingham Trent University 2005 - 2009

Industrial employment

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

Awards

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

Fellowships and scholarships

- Hertford College Junior Research Fellowship (JRF) (£120,000) 2018
- JSPS postdoctoral fellowship (*declined in favour of the JRF*) 2018
- Syngenta fellowship (£30,000) 2013
- BBSRC PhD studentship (£100,000) 2013

Grants

- Google Cloud Platform grant ($5,000) 2019
- National Institute of Informatics internship (£3,000) 2014

Supervision

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

PhD

- Rolf Morel, University of Oxford 2019 -

MSc

- Rolf Morel, University of Oxford (distinction) 2018

BSc

- Andrei Diaconu, University of Oxford (distinction) 2020
- Alastair Flynn, University of Oxford (distinction) 2020

Research internships

- Joar Skalse, University of Oxford 2018

Examination

External PhD examiner

- Lidia Contreras Ochando, Universitat Politècnica de València 2020

Research visits

- Massachusetts Institute of Technology, USA 2016, 2018, 2019
  Visited Professor Josh Tenenbaum
- KU Leuven 2019
  Visited Dr Sebastijan Dumančić
- National Institute of Informatics, Tokyo, Japan 2014, 2015, 2017
  Visited Professor Katsumi Inoue

Publications

Journals

1. **A. Cropper** and R. Morel. Learning programs by learning from failures. *Machine Learning*. To appear.
2. **A. Cropper** and S. Tourret. Logical reduction of metarules. *Machine Learning*, 109(7):1323–1369, 2020
3. **A. Cropper**, R. Evans, and M. Law. Inductive general game playing. *Machine Learning*, 109(7):1393–1434, 2020
4. **A. Cropper**, R. Morel, and S. H. Muggleton. Learning higher-order logic programs. *Machine Learning*, 109(7):1289–1322, 2020
5. **A. Cropper** and S. H. Muggleton. Learning efficient logic programs. *Machine Learning*, 108(7):1063–1083, 2019

Conferences

1. S. Dumančić, T. Guns, and **A. Cropper**. Program refactoring for inductive program synthesis. **AAAI** 2021.
2. **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
3. **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
4. **A. Cropper**. Forgetting to learn logic programs. In *The Thirty-Fourth AAAI Conference on Artificial Intelligence*, ***AAAI*** *2020*, pages 3676–3683. AAAI Press, 2020
5. **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
6. **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
7. 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
8. 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

9. **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
10. **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
11. **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
12. **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
13. **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
14. 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
15. **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
16. **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
17. **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

Workshops

1. S. Dumančić and **A. Cropper**. Inventing abstractions by refactoring knowledge. *Conceptual Abstraction and Analogy in Natural and Artificial Intelligence 2020*.
2. S. Tourret and **A. Cropper**. SLD-resolution reduction of second-order Horn fragments. *Termgraph 2018*.
3. **A. Cropper**. Identifying and inferring objects from textual descriptions of scenes from books. In *2014 Imperial College Computing Student Workshop, ICCSW 2014*, volume 43 of *OASICS*, pages 19–26. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2014

Under review

1. **A. Cropper** and S. Dumančić. A new introduction to inductive logic programming.

Services

Organisation

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

Senior program committee

- IJCAI 2021

Program committee

- AAAI 2020, 2021
- IJCAI 2019, 2020
- ECAI 2020
- ILP 2020

Reviewer

- Machine Learning Journal 2020
- POPL 2020
- StarAI 2020

Other

- IJCAI student volunteer 2015, 2016

Outreach

- Bebras Computing Challenge, Oxford 2019

Selected talks

- Inductive logic programming, UC San Diego 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
- Playgol: learning programs through play, Machine Intelligence 21 2019
- Inductive general game playing, Dagstuhl 2019
- Playgol: learning programs through play, Dagstuhl 2019
- Learning algorithms using logic, University of Oxford 2019
- Learning efficient logic programs, MIT 2018
- Learning efficient logic programs, Dagstuhl 2017
- Learning higher-order logic programs, Dagstuhl 2017
- Learning efficient logic programs, Machine Intelligence 20 2016
- Logic-based learning of programs, UC Berkeley 2016
- Metagol, Dagstuhl 2015
- Predicate invention in meta-interpretive learning, Wakayama University 2014