Andrew Cropper

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Education

PhD Computer Science, Imperial College London   2017
Supervisor: Professor Stephen Muggleton
Thesis: Efficiently learning efficient programs

MSc Computer Science, University of Oxford   2011
Supervisor: Dr Brian Harrington
Thesis: Predicting stock volume using Twitter

BSc Computer Science, Nottingham Trent University   2009
Supervisor: Dr Caroline Langensiepen
Dissertation: Identifying and inferring objects from natural language

Academic employment

Junior Research Fellow, Hertford College, University of Oxford   2018 -

Research Assistant, University of Cambridge   2013

Industry employment

Research Engineer, MFG Labs, Paris, France   2012 - 2013

Software Engineer, Esendex, Nottingham   2010

Software Engineer, Counter Solutions, Derbyshire   2007 - 2008

Research visits

Massachusetts Institute of Technology   2016, 2018
Visited Professor Josh Tenenbaum

National Institute of Informatics, Tokyo, Japan   2014, 2015, 2017
Visited Professor Katsumi Inoue

Awards

Machine Learning journal best paper award   ILP 2018

Machine Learning journal best student paper award   ILP 2014

Grants and fellowships

Google Cloud Platform grant ($5000)   2019

Junior research fellowship, Hertford College, University of Oxford   2018

National Institute of Informatics internship (¥370,500)   2014

Syngenta fellowship (£30,000)   2013

Full BBSRC PhD case studentship (£100,173)   2013

Publications

Journals

1. A. Cropper. Multi-task program induction with forgetting. *Machine Learning*, May 2020.

2. A. Cropper. Self-supervised program induction. *Machine learning*, May 2020.

3. R. Morel and A. Cropper. Learning logic programs using refinement types. *Machine Learning*, May 2020.

4. A. Cropper and S. Tourret. Logical minimisation of metarules. *Machine Learning*. Accepted

5. A. Cropper, R. Evans, and M. Law. Inductive general game playing. *Machine Learning*. Accepted

6. A. Cropper, R. Morel, and S. H. Muggleton. Learning higher-order logic programs. *Machine Learning*. Accepted

7. A. Cropper and S. H. Muggleton. Learning efficient logic programs. *Machine Learning*, 108(7):1063–1083, Jul 2019

Conferences

1. S. Dumancic and A. Cropper. Clustering to find relevant background knowledge. IJCAI 20.

2. K. Ellis and A. Cropper. Learning programs through curious play. IJCAI20.

3. A. Cropper. Inducing logical theories with invented objects. IJCAI20.

4. A. Cropper. Treegol: learning large logic programs from noisy data. IJCAI20.

5. R. Morel and A. Cropper. Meta-interpretive learning with weak constraints. ECAI20.

6. A. Cropper. Learning logic programs by forgetting. AAAI20

7. A. Cropper. Playgol: learning programs through play. In S. Kraus, editor, *Proceedings of the Twenty-Eighth International Joint Conference on Artificial Intelligence, IJCAI 2019, Macao, China, August 10-16, 2019*, pages 6074–6080. ijcai.org, 2019

8. S. Tourret and A. Cropper. SLD-resolution reduction of second-order horn fragments. In F. Calimeri, N. Leone, and M. Manna, editors, *Logics in Artificial Intelligence - 16th European Conference, JELIA 2019, Rende, Italy, May 7-11, 2019, Proceedings*, volume 11468 of *Lecture Notes in Computer Science*, pages 259–276. Springer, 2019

9. R. Morel, A. Cropper, and C. L. Ong. Typed meta-interpretive learning of logic programs. In F. Calimeri, N. Leone, and M. Manna, editors, *Logics in Artificial Intelligence - 16th European Conference, JELIA 2019, Rende, Italy, May 7-11, 2019, Proceedings*, volume 11468 of *Lecture Notes in Computer Science*, pages 198–213. Springer, 2019

10. A. Cropper and S. Tourret. Derivation reduction of metarules in meta-interpretive learning. In F. Riguzzi, E. Bellodi, and R. Zese, editors, *Inductive Logic Programming - 28th International Conference, ILP 2018, Ferrara, Italy, September 2-4, 2018, Proceedings*, volume 11105 of *Lecture Notes in Computer Science*, pages 1–21. Springer, 2018

11. A. Cropper and S. H. Muggleton. Learning higher-order logic programs through abstraction and invention. In S. Kambhampati, editor, *Proceedings of the Twenty-Fifth International Joint Conference on Artificial Intelligence, IJCAI 2016, New York, NY, USA, 9-15 July 2016*, pages 1418–1424. IJCAI/AAAI Press, 2016

12. A. Cropper. Logic-based inductive synthesis of efficient programs. In S. Kambhampati, editor, *Proceedings of the Twenty-Fifth International Joint Conference on Artificial Intelligence, IJCAI 2016, New York, NY, USA, 9-15 July 2016*, pages 3980–3981. IJCAI/AAAI Press, 2016

13. A. Cropper and S. H. Muggleton. Learning efficient logical robot strategies involving composable objects. In Q. Yang and M. Wooldridge, editors, *Proceedings of the Twenty-Fourth International Joint Conference on Artificial Intelligence, IJCAI 2015, Buenos Aires, Argentina, July 25-31, 2015*, pages 3423–3429. AAAI Press, 2015

14. A. Cropper, A. Tamaddoni-Nezhad, and S. H. Muggleton. Meta-interpretive learning of data transformation programs. In K. Inoue, H. Ohwada, and A. Yamamoto, editors, *Inductive Logic Programming - 25th International Conference, ILP 2015, Kyoto, Japan, August 20-22, 2015, Revised Selected Papers*, volume 9575 of *Lecture Notes in Computer Science*, pages 46–59. Springer, 2015

15. C. Farquhar, G. Grov, A. Cropper, S. Muggleton, and A. Bundy. Typed meta-interpretive learning for proof strategies. In K. Inoue, H. Ohwada, and A. Yamamoto, editors, *Late Breaking Papers of the 25th International Conference on Inductive Logic Programming, Kyoto University, Kyoto, Japan, August 20th to 22nd, 2015.*, volume 1636 of *CEUR Workshop Proceedings*, pages 17–32. CEUR-WS.org, 2015

16. A. Cropper. Learning efficient logic programs. In Q. Yang and M. Wooldridge, editors, *Proceedings of the Twenty-Fourth International Joint Conference on Artificial Intelligence, IJCAI 2015, Buenos Aires, Argentina, July 25-31, 2015*, pages 4359–4360. AAAI Press, 2015

17. A. Cropper and S. Muggleton. Can predicate invention compensate for incomplete background knowledge? In S. Nowaczyk, editor, *Thirteenth Scandinavian Conference on Artificial Intelligence - SCAI 2015, Halmstad, Sweden, November 5-6, 2015*, volume 278 of *Frontiers in Artificial Intelligence and Applications*, pages 27–36. IOS Press, 2015

18. A. Cropper and S. H. Muggleton. Logical minimisation of meta-rules within meta-interpretive learning. In J. Davis and J. Ramon, editors, *Inductive Logic Programming - 24th International Conference, ILP 2014, Nancy, France, September 14-16, 2014, Revised Selected Papers*, volume 9046 of *Lecture Notes in Computer Science*, pages 62–75. Springer, 2014

Workshops

1. S. Tourret and A. Cropper. SLD-resolution reduction of second-order Horn fragments. *Termgraph 2018*.

2. A. Cropper. Identifying and inferring objects from textual descriptions of scenes from books. In R. Neykova and N. Ng, editors, *2014 Imperial College Computing Student Workshop, ICCSW 2014, September 25-26, 2014, London, United Kingdom*, volume 43 of *OASICS*, pages 19–26. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2014

Teaching

Tutor in Computational Logic, Stanford University   2019

Supervision

PhD theses

Rolf Morel, University of Oxford   2019 -

MSc theses

Rolf Morel, University of Oxford   2018

Services

Program committee

IJCAI   2019

StarAI   2020

Talks

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