

Christian Kroer

Curriculum Vitae

Research interests

- Fields Artificial intelligence, algorithms, economics, operations research.
- Specific Equilibrium computation, mechanism design, auctions, prediction markets, combinatorial optimization, convex optimization, machine learning, and practical applications.

Education

- 2012–now **Ph.D. in computer science**, *Carnegie Mellon University*, Pittsburgh, PA, USA.
- 2009–2012 **M.Sc. IT - software development and technology**, *IT University of Copenhagen*, Copenhagen, Denmark.
- 2006–2009 **B.A. human-centered informatics**, *Aalborg University*, Aalborg, Denmark.

Employment and Internships

- 2012 - now **Research Assistant**, *Carnegie Mellon University*.
- 2016 - 2017 **Research Scientist (short-term contractor position)**, *Facebook, Operations, Economics and Computation team*.
- Summer 2016 **Research Intern**, *Facebook, Operations, Economics and Computation team*.
- Summer 2015 **Research Intern**, *Microsoft Research New York City*.
- 2012 **Research Assistant (short-term contractor position)**, *Aalborg University*.
- 2011 - 2012 **Teaching Assistant**, *IT University of Copenhagen*.
- 2010 - 2011 **Systems Developer**, *Netmester A/S*.

Honors and Awards

- 2016 - 2018 Facebook Fellowship in economics and computation.

Working Papers

- [18] Vincent Conitzer, Christian Kroer, Eric Sodomka, and Nicolas E. Stier-Moses. *Multiplicative Pacing Equilibria in Auction Markets*. 2017.
- [17] Gabriele Farina, Christian Kroer, and Tuomas Sandholm. *Regret Minimization in Behaviorally-Constrained Zero-Sum Games*. 2017.

Publications

- [16] Noam Brown, Christian Kroer, and Tuomas Sandholm. "Dynamic Thresholding and Pruning for Regret Minimization". In: *AAAI*. 2017.
- [15] Christian Kroer, Gabriele Farina, and Tuomas Sandholm. "Smoothing Method for Approximate Extensive-Form Perfect Equilibrium". In: *IJCAI*. 2017.
- [14] Christian Kroer, Kevin Waugh, Fatma Kılınç-Karzan, and Tuomas Sandholm. "Theoretical and Practical Advances on Smoothing for Extensive-Form Games". In: *EC*. 2017.
- [13] Christian Kroer, Miroslav Dudík, Sébastien Lahaie, and Sivaraman Balakrishnan. "Arbitrage-Free Combinatorial Market Making via Integer Programming". In: *EC*. 2016.
- [12] Christian Kroer and Tuomas Sandholm. "Imperfect-Recall Abstractions with Bounds in Games". In: *EC*. 2016.
- [11] Christian Kroer and Tuomas Sandholm. "Sequential Planning for Steering Immune System Adaptation". In: *IJCAI*. 2016.
- [10] Christian Kroer and Tuomas Sandholm. "Computational Bundling for Auctions". In: *AAMAS*. 2015.
- [9] Christian Kroer and Tuomas Sandholm. "Discretization of Continuous Action Spaces in Extensive-Form Games". In: *AAMAS*. 2015.
- [8] Christian Kroer and Tuomas Sandholm. "Limited Lookahead in Imperfect-Information Games". In: *IJCAI*. 2015.
- [7] Christian Kroer, Kevin Waugh, Fatma Kılınç-Karzan, and Tuomas Sandholm. "Faster First-Order Methods for Extensive-Form Game Solving". In: *EC*. 2015.
- [6] Bruce DeBruhl, Christian Kroer, Anupam Datta, Tuomas Sandholm, and Patrick Tague. "Power napping with loud neighbors: optimal energy-constrained jamming and anti-jamming". In: *WiSec*. 2014.
- [5] Christian Kroer and Tuomas Sandholm. "Extensive-Form Game Abstraction With Bounds". In: *EC*. 2014.
- [4] Christian Kroer, Martin Kjær Svendsen, Rune M Jensen, Joseph Kiniry, and Eilif Leknes. "Symbolic Configuration for Interactive Container Ship Stowage Planning". In: *Computational Intelligence* (2014).
- [3] Paolo Viappiani and Christian Kroer. "Robust optimization of recommendation sets with the maximin utility criterion". In: *ADT*. 2013.
- [2] Kevin Tierney, Amanda Jane Coles, Andrew Coles, Christian Kroer, Adam M Britt, and Rune Møller Jensen. "Automated Planning for Liner Shipping Fleet Repositioning." In: *ICAPS*. 2012.

- [1] Christian Kroer and Yuri Malitsky. "Feature filtering for instance-specific algorithm configuration". In: *ICTAI*. 2011.

Teaching

- 2016 **Vertical mentor**, *Electronic Negotiation*, Carnegie Mellon University.
- 2016 **TA**, *Graduate Artificial Intelligence*, Carnegie Mellon University.
- 2015 **Vertical mentor**, *Electronic Negotiation*, Carnegie Mellon University.
- 2015 **TA**, *Artificial Intelligence*, Carnegie Mellon University, Nominated for TA award.
- 2014 **Vertical mentor**, *Electronic Negotiation*, Carnegie Mellon University.
- 2012 **TA**, *Intelligent Systems Programming*, IT University of Copenhagen.
- 2011 **TA**, *Algorithm Design*, IT University of Copenhagen.

Service

- Reviewing EC 2017, AAAI 2017, AISTAT 2017, ICML 2016, WINE 2015, JAAMAS 2015, 2016, ACM Transactions on Economics and Computation, 2013, 2014, Transactions on Computational Intelligence and AI in Games 2014, 2015.
- 2017 Member of the CMU CSD Speakers Club.
- 2017 Program committee member for the Computer Poker Workshop at AAAI.
- 2016 Program committee member for IJCAI.
- 2014 - 2016 CMU CS Ph.D. admissions committee member.
- 2013 CMU CSD Immigration Course coordinator.

Programming

- Strong experience Java, Python, C++, C#.
- Medium experience SQL, C, HTML, CSS.
- Familiar with R, Matlab, Scala, XSLT, Ruby, Javascript.

Frameworks

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|-----------------|------------------------------|---------------|-----------------------------------|
| OS | Linux, OS X, Windows. | Statistics/ML | pandas, scikit-learn, tidyverse. |
| Version control | Git, SVN, Mercurial. | Web | ASP.NET, React, Bootstrap, Flask. |
| Optimization | CPLEX, Gurobi, NumPy, CVXPY. | | |

Invited talks

- 2016 Arbitrage-Free Combinatorial Market Making via Integer Programming. INFORMS Annual Conference.
- 2015 Faster First-Order Methods for Extensive-Form Game Solving. INFORMS Annual Conference.

- 2015 Faster First-Order Methods for Extensive-Form Game Solving. 22nd International Symposium on Mathematical Programming (ISMP).
- 2013 Computational Bundling for Auctions. INFORMS Annual Conference.

Other talks

- 2016 Faster First-Order Methods for Extensive-Form Game Solving. CMU AI Seminar.
- 2016 Faster First-Order Methods for Extensive-Form Game Solving. INFORMS Annual Conference.
- 2016 Arbitrage-Free Combinatorial Market Making via Integer Programming. Facebook Operations, Economics and Computation group.
- 2016 Abstraction and convex optimization in sequential game solving. CMU graduate AI class.
- 2015 Discretization of Continuous Action Spaces in Extensive-Form Games. INFORMS Annual Conference.
- 2014 Sequential game solving overview. CMU undergrad AI class.
- 2014 Extensive-Form Game Abstraction with Bounds. CMU theory lunch.
- 2014 Extensive-Form Game Abstraction with Bounds. CMU open house.

References

Available upon request.