

# Christian Kroer

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## CONTACT INFORMATION

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## 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 of all the above.

## EDUCATION

### **Carnegie Mellon University**

*Ph.D. Computer Science*

May 2012 –

### **IT University of Copenhagen**

*M.Sc. IT - Software Development and Technology*

August 2009 – April 2012

### **Aalborg University**, Aalborg, Denmark

*BA. Human-centered informatics*

September 2006 – June 2009

## EMPLOYMENT AND INTERNSHIPS

**Carnegie Mellon University**, *Research assistant*.

May 2012 –

**Microsoft Research New York**, *Research intern*.

May 2015 – August 2015

**Aalborg University**, *Research assistant*.

February 2012 – April 2012

**IT University of Copenhagen**, *Teaching assistant*.

September 2011 – June 2012

**Netmester A/S**, Copenhagen, Denmark, *Systems developer*.

January 2010 – August 2011

## PUBLICATIONS

**Faster First-Order Methods for Extensive-Form Game Solving.** Christian Kroer, Kevin Waugh, Fatma Kilinç-Karzan, and Tuomas Sandholm. *ACM Conference on Economics and Computation*, (EC), 2015.

**Limited Lookahead in Incomplete-Information Games.** Christian Kroer and Tuomas Sandholm. *International Joint Conference on Artificial Intelligence*, (IJCAI), 2015.

**Discretization of Continuous Action Spaces in Extensive-Form Games.** Christian Kroer and Tuomas Sandholm. *International Conference on Autonomous Agents and Multiagent Systems*, (AAMAS), 2015.

**Computational Bundling for Auctions.** Christian Kroer and Tuomas Sandholm. *International Conference on Autonomous Agents and Multiagent Systems*, (AAMAS), 2015. A longer version was released as a CMU tech report.

**Extensive-form Game Abstraction with Bounds.** Christian Kroer and Tuomas Sandholm. *ACM Conference on Economics and Computation*, (EC), 2014.

**Power Napping with Loud Neighbors: Optimal Energy-Constrained Jamming and Anti-Jamming.** Bruce DeBruhl, Christian Kroer, Anupam Datta, Tuomas Sandholm, and Patrick Tague *7th ACM Conference on Security & Privacy in Wireless and Mobile Networks*, (WiSec), 2014.

**Symbolic Configuration for Interactive Container Ship Stowage Planning.** Christian Kroer, Martin K. Svendsen, Rune M. Jensen, Joseph Kiniry, and Eilif Leknes. *Computational Intelligence*, 2014.

**Robust Optimization of Recommendation Sets with the Maximin Utility Criterion.** Paolo Vappiani and Christian Kroer. *3rd International Conference on Algorithmic Decision Theory*, (ADT). 2013. Previously appeared at *6th Multidisciplinary Workshop on Advances in Preference Handling*, (ECAI Workshop). 2012.

**Automated Planning for Liner Shipping Fleet Repositioning.** Kevin Tierney, Amanda Coles, Andrew Coles, Christian Kroer, Adam Britt and Rune M. Jensen. *International Conference on Automated Planning and Scheduling*, (ICAPS). 2012.

**Feature Filtering for Instance Specific Algorithm Configuration.** Christian Kroer and Yuri Malitsky. *IEEE International Conference on Tools in Artificial Intelligence*, (ICTAI). 2011.

#### INVITED TALKS

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), 2015.

Computational Bundling for Auctions. INFORMS Annual Conference, 2013.

#### OTHER TALKS

Discretization of Continuous Action Spaces in Extensive-Form Games. INFORMS Annual Conference, 2015.

Extensive-Form Game Abstraction with Bounds. CMU theory lunch, 2014.

Extensive-Form Game Abstraction with Bounds. CMU open house, 2014.

#### TEACHING EXPERIENCE

|     |      |                                 |               |  |
|-----|------|---------------------------------|---------------|--|
| CMU | 2015 | Electronic Negotiation          | Graduate      | Vertical mentor                            |
| CMU | 2014 | Artificial Intelligence         | Undergraduate | TA ( <b>nominated for teaching award</b> ) |
| CMU | 2014 | Electronic Negotiation          | Graduate      | Vertical mentor                            |
| ITU | 2012 | Intelligent Systems Programming | Graduate      | TA   |
| ITU | 2011 | Algorithm Design                | Graduate      | TA   |

#### COMMUNITY SERVICE

IJCAI 2016, program committee.

INFORMS 2015, chair, sponsored session, “Efficient Algorithms for Large-Scale Convex Games”

CMU Computer Science PhD program admissions committee 2014-2015, 2015-2016.

CMU Immigration Course coordinator 2013.

Reviewer for:

WINE 2015.

JAAMAS 2015.

ACM Transactions on Economics and Computation, 2013, 2014.

Transactions on Computational Intelligence and AI in Games 2014, 2015.

#### RELEVANT GRADUATE COURSEWORK

|     |      |   |
|-----|------|---|
| CMU | 2015 | Analytical Performance Modeling (audit) |
| CMU | 2015 | Graduate Algorithms                     |
| CMU | 2014 | Modern Convex Optimization              |
| CMU | 2013 | Foundations of Electronic Marketplaces  |
| CMU | 2013 | Algorithms, Games, and Networks         |
| CMU | 2013 | Convex Optimization                     |
| CMU | 2012 | Linear Programming                      |
| CMU | 2012 | Machine Learning                        |
| ITU | 2010 | Algorithm Design                        |
| ITU | 2010 | Efficient AI Programming                |

#### PROGRAMMING

Strong experience: Java, Python, C++, C#.  
Medium experience: SQL, Matlab, Scala, C, HTML, CSS.  
Familiar with: R, Lua, XSLT.

#### FRAMEWORKS

Extensive UNIX and Windows development experience. Git, SVN, pandas, numpy, CPLEX, Gurobi, scikit-learn, XGBoost, Torch, .Net.

#### REFERENCES

Tuomas Sandholm  
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Carnegie Mellon University  
<http://www.cs.cmu.edu/~sandholm>  
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Fatma Kılınç-Karzan  
Assistant Professor of Operations Research  
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Associate Professor of Computer Science  
IT University of Copenhagen  
<http://www.itu.dk/people/rmj/pmwiki/>  
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