

# Arthur Carvalho

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David Cheriton School of Computer Science  
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## Research Interests

Information Markets, Scoring Rules, Consensus, Crowdsourcing, Fair Division, Game Theory, Mechanism Design, Electronic Commerce, Decision Analysis, Autonomous Agents and Multiagent Systems, Artificial Intelligence

## Education

- Ph.D. in Computer Science, University of Waterloo, Canada

David R. Cheriton School of Computer Science  
September 2010 – Present  
Supervisor: Professor Kate Larson  
Current Grade Point Average: 93 / 100  
Thesis: TBD

- Master of Mathematics in Computer Science, University of Waterloo, Canada

David R. Cheriton School of Computer Science  
May 2009 – August 2010  
Supervisor: Professor Kate Larson  
Grade Point Average: 89 / 100  
Thesis: Sharing Rewards Based on Subjective Opinions

- B.Sc. in Computer Science, Federal University of Pernambuco, Brazil

Center of Informatics  
October 2004 – December 2008  
Supervisor: Professor Aluizio Araujo  
Grade Point Average: 8.75 / 10  
Thesis: Obtendo Diversidade em Algoritmos Evolucionários Multi-Objetivo

## Professional Experience

- **University of Waterloo** - Research and Teaching Assistant

Waterloo (Canada), May 2009 – Present

I have been developing new prediction market models with strong convergence guarantees. I also applied game theory and mechanism design techniques to the problems of how to share a reward based on peer evaluations and how to incentivize truthfulness in the peer-review process.

- **Neurotech Ltda** - Data Mining Trainee

Recife (Brazil), January 2008 – December 2008

I was part of a team responsible for the development (concept and prototype) of a tool that evaluates the performance of neural network systems.

- **Cemicro Informática** - Software Engineering Intern

Recife (Brazil), September 2006 – November 2006

I was part of a team responsible for the development of a content management system.

## Teaching Experience

### *Teaching Assistant*

Duties: proctoring and marking exams and assignments; leading tutorials; course development.

<b>Course</b>	<b>Institution</b>	<b>Period</b>
Elementary Algorithm Design and Data Abstraction	University of Waterloo	Spring 2012, Winter 2012
Introduction to Artificial Intelligence	University of Waterloo	Fall 2009 - Winter 2012 (x7)
Introduction to Computer Science 2	University of Waterloo	Winter 2010, Spring 2009
Intelligent Systems	Federal University of Pernambuco	Fall 2007, Spring 2007
Communication Infrastructure	Federal University of Pernambuco	Fall 2006, Spring 2006
Discrete Mathematics	Federal University of Pernambuco	Fall 2005, Spring 2005

## Academic Service

### *Refereeing and Reviewing for Academic Journals*

Natural Computing (NACO), 2012

Engineering Applications of Artificial Intelligence (EAAI), 2010

### *Conference Program Committees*

International Conference on Principles and Practice of Multi-Agent Systems (PRIMA), 2012

International Joint Conference on Artificial Intelligence (IJCAI), 2011

### *External Reviewer*

National Conference on Artificial Intelligence (AAAI), 2012

International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2012

## **Scholarships, Grants, and Bursaries**

<b>Name</b>	<b>Institution</b>	<b>Period</b>	<b>Value</b>
IEEE CIS Travel Grant	CIS/IEEE	2011	\$800
GECCO Student Travel Grant	ACM	2011	\$800
AAMAS Student Scholarship	AAMAS/IFAAMAS	2011	\$973
David R. Cheriton Scholarship	University of Waterloo	2011 – 2012	\$20,000
AAMAS Student Scholarship	AAMAS/IFAAMAS	2010	\$450
Mathematics Graduate Experience Award	University of Waterloo	2009 – 2012	\$13,000
International Doctoral Student Graduate Entrance Scholarship	University of Waterloo	2010 – 2014	≈\$39,000
International Masters Student Award	University of Waterloo	2009 – 2010	\$6,245
CNPq/PIBIC Scholarship (x2)	Brazilian National Council for Scientific and Technological Development	2006, 2007	≈\$2,150 (x2)

## **Publications**

### *Working Papers*

1. Arthur Carvalho and Kate Larson. Sharing Rewards Among Strangers Based on Peer Evaluations. *Under review.*
2. Arthur Carvalho and Kate Larson. On a Reliable Peer-Review Process. Available at: <http://arxiv.org/abs/1204.5963>
3. Arthur Carvalho and Kate Larson. A Consensual Linear Opinion Pool. Available at: <http://arxiv.org/abs/1204.5399>

### *Refereed Conferences*

4. Arthur Carvalho and Kate Larson. A Truth Serum for Sharing Rewards. In *Proceedings of the 10th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2011)*, pp. 635-642, Taipei, Taiwan, 2011.
5. Arthur Carvalho and Renato Oliveira. Reinforcement Learning for the Soccer Dribbling Task. In *Proceedings of the 2011 IEEE Conference on Computational Intelligence and Games (CIG 2011)*, pp. 95-101, Seoul, South Korea, 2011.
6. Arthur Carvalho. A Cooperative Coevolutionary Genetic Algorithm for Learning Bayesian Network Structures. In *Proceedings of the 13th Genetic and Evolutionary Computation Conference (GECCO 2011)*, pp. 1131-1138, Dublin, Ireland, 2011.
7. Arthur Carvalho and Kate Larson. Sharing a Reward Based on Peer Evaluations. In *Proceedings of the 9th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2010)*, pp. 1455-1456, Toronto, Canada, 2010.
8. Renato Oliveira, Paulo Adeodato, Arthur Carvalho, Icamaan Silva, Christian Daniel, and Tsang Ing Ren. A Data Mining Approach to Solve the Goal Scoring Problem. In *Proceedings of the 22nd International Joint Conference on Neural Networks (IJCNN 2009)*, pp. 2347-2352, Atlanta, USA, 2009.

### *Refereed Workshops, Symposia, and Non-English Papers*

9. Arthur Carvalho and Aluizio Araujo. Improving NSGA-II with an Adaptive Mutation Operator. In *Proceedings of the 11th Genetic and Evolutionary Computation Conference (GECCO 2009)*, Graduate Student Workshop Session, pp. 2697-2700, Montreal, Canada, 2009.
10. Arthur Carvalho, Aluizio Araujo, Icamaan Silva, and Christian Daniel. Um Modelo de Otimização para o Problema de Design Ótimo da Programação N-Versões. In *Proceedings of the VIII Encontro Regional de Matemática Aplicada e Computacional (ERMAC 2008)*, Natal, Brazil, 2008.
11. Sandro Oliveira, Alexandre Vasconcelos, T. Carvalho, Arthur Carvalho, and R. Pereira. A Software Process Reuse Model in ImPProS. In *Proceedings of the 33rd EUROMICRO Conference on Software Engineering and Advanced Applications (SEAA 2007)*, Work in Progress Session, Luebeck, Germany, 2007.
12. Arthur Carvalho. Uma Proposta de Arquitetura de Software Genérica para Mobile Games Utilizando J2ME. In *Proceedings of the V Brazilian Symposium on Computer Games and Digital Entertainment (SBGames 2006)*, Recife, Brazil, 2006.

### *Theses*

13. Arthur Carvalho. Sharing Rewards Based on Subjective Opinions. *Master of Mathematics Thesis*, University of Waterloo, Waterloo, Canada, 2010.
14. Arthur Carvalho. Obtendo Diversidade em Algoritmos Evolucionários Multi-Objetivo. *Undergraduate Thesis*, Federal University of Pernambuco, Recife, Brazil, 2008.

## Talks

*On a Reliable Peer-Review Process.* AI lab seminar, University of Waterloo, 2011

*A Truth Serum for Sharing Rewards.* Graduate Student Research Conference, University of Waterloo, 2011

## Poster Presentations

*On a Reliable Peer-Review Process.* Cheriton Research Symposium, University of Waterloo, 2011

## Leadership, Outreach, and Volunteer Work

- Computer Science Commons Committee, July 2011 - Present

Graduate student representative in the Computer Science Commons Committee at the University of Waterloo. The Commons Committee is responsible for initiatives that foster community spirit.

- A.R. Kaufman Family YMCA, July 2011 - September 2011

Recreational sports volunteer.

- Graduate Student Mentorship Program, Fall 2010 - Fall 2011 (x3)

Mentor of new computer science graduate students at the University of Waterloo.

- Volunteer at various events at the University of Waterloo

Canada Day, 2011

Graduate Student Research Conference, 2011

Grad Visit Day, 2011

Cheriton Research Symposium, 2010

## Language Skills

Portuguese (native), English, Spanish

## Programming Skills

C++, Java, Matlab, Maple, CPLEX (Studio)

## Miscellaneous

Completed Organizational & Human Development's Student Leadership Program at the University of Waterloo, 2011

Sun Certified Mobile Application Developer for the Java 2 Platform (SCMAD), 2005

Sun Certified Programmer for the Java 2 Platform, Standard Edition 1.4 (SCJP), 2005

Last updated: April 26, 2012