

# Bruno Castro da Silva

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## Academic Employment

<b>Assistant Professor</b> <b>University of Massachusetts</b> College of Information and Computer Sciences	Jan. 2021 — present
<b>Associate Professor</b> <b>Federal University of Rio Grande do Sul</b> (Brazil) Computer Science Department <i>Program ranked #1 in the country</i>	Aug. 2015 — Jan. 2021
<b>Postdoctoral Associate</b> <b>MIT - Laboratory for Information &amp; Decision Systems</b> Supervisor: Professor Jonathan How	Jan. 2015 — Aug. 2015

## Education

<b>Doctor of Philosophy</b> — Computer Science <b>University of Massachusetts at Amherst</b> Dissertation: <i>Learning Parameterized Skills</i> Cumulative GPA: 3.935/4.0 Supervisor: Professor Andrew G. Barto	Sept. 2007 — Dec. 2015
<b>Master of Science</b> — Computer Science <b>Federal University of Rio Grande do Sul</b> (Brazil) Dissertation: <i>Reinforcement Learning in Non-Stationary Environments</i> <i>Graduate program ranked #2 in the country</i> Cumulative GPA: 4.0/4.0 Supervisor: Professor Ana Lucia C. Bazzan	Mar. 2005 — Mar. 2007
<b>Bachelor of Science <i>Cum Laude</i></b> — Computer Science <b>Federal University of Rio Grande do Sul</b> (Brazil) <i>Program ranked #1 in the country</i> Cumulative GPA: 3.8/4.0 Supervisor: Professor Raul Fernando Weber	Mar. 1999 — Mar. 2004

## Research Experience

- Massachusetts Institute of Technology** 2015  
 - *Postdoctoral Associate* (Laboratory for Information & Decision Systems)  
 - *Research topics*: Robot learning and control of teams of quadcopters  
 Supervisor: Professor Jonathan How
- Adobe Research** Summer 2014  
 - *Research Intern*  
 - *Research topics*: Automatic discovery of high-performance features  
 for digital marketing optimization  
 Supervisor: Trung Bui
- University of Massachusetts at Amherst** Fall 2011 — Spring 2014  
 - *Research Assistant*  
 - *Research topics*: Distributed active sample collection; transfer learning  
 Supervisor: Professor Victor Lesser
- Istituto di Scienze e Tecnologie della Cognizione, Italy** Winter 2017  
 - *Research Assistant* Summer 2013  
 - *Research topics*: Construction of motor skills on a physical humanoid robot Winter 2012  
 Supervisors: Gianluca Baldassarre; Professor Andrew G. Barto Summer 2011
- University of Massachusetts at Amherst** Fall 2008 — Spring 2010  
 - *Research Assistant*  
 - *Research topics*: Efficient exploration of large state spaces;  
 Motor skill discovery via Lyapunov metrics  
 Supervisor: Professor Andrew G. Barto
- Universidade Federal do Rio Grande do Sul (Brazil)** Aug. 2003 — Feb. 2004  
 - *Research Assistant* (CNPq/DTI Scholarship)  
 - *Research topics*: Urban traffic optimization  
 Supervisor: Professor Ana Lucia C. Bazzan
- Universidade Federal do Rio Grande do Sul (Brazil)** July 2002 — June 2003  
 - *Undergraduate Research Assistant*  
 - *Research topics*: Urban optimization and scientific visualization  
 Supervisor: Professor Ana Lucia C. Bazzan

**Universidade Federal do Rio Grande do Sul (Brazil)**

June 2000 — June 2002

- *Undergraduate Research Assistant*
- *Research topics:* Genetic algorithms for computer-aided design;  
Geographical information systems
- Supervisor: Professor Benamy Turkienicz

## Teaching Experience

**Federal University of Rio Grande do Sul (Brazil)**

2015 — 2020

- *Artificial Intelligence (INF01048)*
- Average instructor rating: 4.88/5.0

(course offered  
twice a year)**Federal University of Rio Grande do Sul (Brazil)**

2017 — 2020

- *Machine Learning (INF01017; CMP263)*
- Undergraduate and graduate level
- Average instructor rating: 4.89/5.0

(course offered  
twice a year)**Federal University of Rio Grande do Sul (Brazil)**

Fall 2019

- *Reinforcement Learning (CMP604)*
- Graduate level

**Federal University of Rio Grande do Sul (Brazil)**

2015 — 2019

- *Introduction to Algorithms (INF01040)*
- Average instructor rating: 4.77/5.0

(course offered  
twice a year)**University of Oslo (Norway)**

Fall 2020

- *Advanced Topics in Artificial Intelligence for Intelligent Systems (IN5490)*
- Invited lecturer

Fall 2019

Fall 2018

**University of Massachusetts at Amherst**

Fall 2014

- *Programming with Data Structures (CS187)*
- Teaching Assistant
- Supervisor: Professor David Barrington

**University of Massachusetts at Amherst**

Spring 2011

- *Design of large-scale, high-performance systems (CS377, CS291SP)*
- Teaching Assistant
- Supervisors: Professors Mark Corner and Emery Berger

Fall 2010

Spring 2007

**University of Massachusetts at Amherst**

Fall 2007

- *Programming Languages Paradigms (CS287)*
- Teaching Assistant
- Supervisor: Professor Wendy Lehnert

<b>Lutheran University of Brazil</b> (Brazil) - <i>Computer Networks</i> - Undergraduate level	Spring 2006
<b>Lutheran University of Brazil</b> (Brazil) - <i>Introduction to Object Oriented Programming</i> - Undergraduate level	Spring 2006
<b>Federal University of Rio Grande do Sul</b> (Brazil) - <i>Advanced Artificial Intelligence (INF05005)</i> - Teaching Assistant - Supervisor: Professor Ana Lucia C. Bazzan	Fall 2005

## Invited Talks, Seminars, and Colloquia

- University of Oslo. *Introduction to Deep Reinforcement Learning*. Oslo, Norway, August, 2019.
- University of Oslo. *How to Write a Scientific Paper*. Oslo, Norway, August, 2019.
- Frankfurt Institute for Advanced Studies. *Identifying Reusable Behaviors via Policy Compression & Early-Life Option Evolution*. Keynote Speaker at the 4th International Workshop on Intrinsically Motivated Open-ended Learning. Frankfurt, Germany, July, 2019.
- Frankfurt Institute for Advanced Studies. *Learning Behaviors that Generalize*. Keynote Speaker at the International Summer School on Intrinsically Motivated Open-Ended Learning. Frankfurt, Germany, June, 2019.
- Federal University of Rio Grande do Sul—Astronomy Department. *Introduction to Machine Learning*. Porto Alegre, Brazil, June, 2019.
- University of Oslo. *Evolution Strategies as a Scalable Alternative to Reinforcement Learning*. Oslo, Norway, November, 2018.
- University of Oslo. *Deep Neural Networks*. Oslo, Norway, August, 2018.
- Pint of Science. *Star Wars & Artificial Intelligence*. Porto Alegre, Brazil, May, 2018.
- University of Oslo. *How to Write a Scientific Paper*. Oslo, Norway, April, 2018.
- Microsoft Research Latin American Faculty Summit. *Learning Reusable Skills and Behavioral Hierarchies*. Keynote Speaker. Rio de Janeiro, Brazil, May, 2016.
- Federal University of Rio Grande do Sul—Computer Science Department. *Parameterized Motor Skills Applied to Robotics*. Porto Alegre, Brazil, August, 2014.
- University of Texas at Austin. *Learning Parameterized Motor Skills*. Colloquia on Artificial Intelligence. May, 2014.
- Brown University. *Learning Parameterized Motor Skills*. Computer Science Colloquium. May, 2014.
- Massachusetts Institute of Technology—CSAIL. *Learning Parameterized Motor Skills*. May, 2014.

- University of Massachusetts. *Learning Parameterized Skills on the iCub*. Laboratory for Perceptual Robotics, August, 2013.
- Italian National Research Council. *Learning Parameterized Skills*. November, 2012.
- University of Massachusetts. *Learning Parameterized Skills*. Autonomous Learning Lab, June, 2012.
- University of Massachusetts. *Teaching Assistant Orientation*. International Teaching Assistants and Cross-Cultural Teacher Issues Workshop. September of 2011, 2010, 2009, and 2008.
- University of Massachusetts. *Empowerment for Continuous Agent-Environment Systems*. Autonomous Learning Lab, April, 2011.
- Italian National Research Council. *Transfer of Parameterized Policies*. June, 2011.
- University of Massachusetts. *Gittins Indices*. Autonomous Learning Lab, December, 2010.
- University of Massachusetts. *Efficient Exploration, A New Criteria for Creating Skills, and Some More Random Stuff*. Autonomous Learning Lab, September, 2009.
- University of Massachusetts. *Reinforcement Learning in Non-Stationary Environments*. Autonomous Learning Lab, March, 2008.

## Journal and Conference Reviewing

I have, since 2007, regularly acted as a reviewer (Program Committee member) or as Senior Program Committee member for the following journals and conferences:

- Journal of Machine Learning Research (JMLR)
- Machine Learning
- Journal of Artificial Intelligence Research (JAIR)
- Journal of Robotics and Autonomous Systems
- Autonomous Robots
- International Conference on Machine Learning (ICML)
- Conference on Neural Information Processing Systems (NeurIPS)
- International Conference on Artificial Intelligence (AAAI)
- International Joint Conference on Artificial Intelligence (IJCAI)
- International Conference on Autonomous Agents and Multiagent Systems (AAMAS)
- Conference on Uncertainty in Artificial Intelligence (UAI)
- International Conference on Intelligent Robots and Systems (IROS)
- International Conference on Development and Learning (ICDL)
- International Conference on Robotics and Autonomous Systems (ICRA)
- IEEE-RAS International Conference on Humanoid Robots
- IEEE Transactions on Robotics

## Projects, Grants, and Funding

- *Digital Geology: Integrated Search of Heterogeneous Geoscientific Data*. Role: Co-Principal Investigator. Petrobras/Federal Brazilian government. Award amount: ~500.000 Dollars.
- *Collaboration on Intelligent Machines (COINMAC)*. Role: Co-Principal Investigator. Research Council of Norway and Norwegian Centre for International Cooperation in Education. Award amount: ~350,000 Euros.
- *Goal-Based Open-ended Autonomous Learning Robots*. Role: Researcher/Project Organizer. European Commission. Grant number: 713010. Award amount: ~3.5 million Euros.
- *Rio Grande do Sul and Oslo Collaboration on Artificial Intelligence and Robotics (ROCAIR)*. Role: Co-Principal Investigator/Researcher. Norwegian Agency for International Cooperation and Quality Enhancement in Higher Education. Grant number: UTF-2016-CAPES-SIU/10007. Award amount: ~30,000 Euros.
- *Designing Flexible Motor Controllers for Robots in Unstructured Environments*. Role: Principal Investigator. Research Support Foundation of Rio Grande do Sul. Grant number: 17/25511000086815. Award amount: ~5,000 Dollars.
- *Intrinsically Motivated Cumulative Learning Versatile Robots*. Role: Participant/Researcher. European Commission. Grant number: FP7-ICT-IP-231722. Award amount: ~7 million Euros.

## General Academic Service

- Since 2015 I have served as a member of many thesis committees: 12 Master's committees and 5 Ph.D. committees.
- From 2017 to 2019, I acted as the leading professor supporting and helping with the logistics of *program.ada*, a group of students raising awareness about the issues that women and other underrepresented groups face in computer science. This group organizes outreach activities, roundtable discussions, and promotes mentoring opportunities to build a community that supports, encourages, and empowers the next generation of female scientists to succeed.
- From 2017 to 2019, I was the organizer of the *Women in Science* outreach project, which promoted events to shed light on the untold stories of important women in science and technology and aimed at encouraging women to pursue STEM careers.
- Since 2018 I have chaired the *Internal Affairs Commission* at the Computer Science department of the Federal University of Rio Grande do Sul. This commission consists of a group of faculty that acts as informal first-responders to help students deal with cases of discrimination, sexism, and harassment.
- Since 2018 I have been serving as a group advisor for the local branch of the *IEEE Women in Technology* affinity group. This group's mission is to encourage women to pursue STEM careers and to inspire women around the world to follow their academic interests in careers in science.

- In 2016 and 2017 I served as part of the committee for hiring computer science lecturers at the Federal University of Rio Grande do Sul, in Brazil.
- From 2008 to 2012 I was a regular speaker at the *International Teaching Assistants and Cross-Cultural Issues* seminars at the University of Massachusetts. The goal of these seminars was to help international students better understand the cultural differences between their countries and the US, to more easily adapt to their new professional environments, and to discuss ways by which they could contribute to enrich the university with their unique perspectives and experiences.
- From 2012 to 2013 I served as a Graduate Representative at the University of Massachusetts Amherst.

## Honors and Awards

- Distinguished Senior Program Committee Member — IJCAI 2018.
- Best Senior Program Committee Member — AAMAS 2017.
- Outstanding Teaching Assistant Award — University of Massachusetts, 2010.
- Graduated *cum laude* in Computer Science. Cumulative GPA: 3.8/4.0. March 2004.
- Brazilian Computer Society Distinguished Student Award. March 2004.
- Academic Distinction in Computer Science Award.  
Union of Computer Science Companies of Rio Grande do Sul. Brazil, 2004.
- Best student in the class of 2003 — Computer Science.  
Federal University of Rio Grande do Sul. Brazil, 2003.
- First honorable mention in the 10th Scientific Fair.  
Federal University of Rio Grande do Sul/PROPESQ. 2002.
- Bronze medalist in the ACM International Collegiate Programming Contest.  
South America. October, 2001.
- Gold medalist in the ACM International Collegiate Programming Contest.  
Brazil - Southern Region. October, 2001.

## Publications

1. ALEGRE, Lucas; BAZZAN, Ana L. C.; **da SILVA, Bruno C.** *Minimum-Delay Adaptation in Non-Stationary Reinforcement Learning via Online High-Confidence Change-Point Detection*. Proceedings of the 20th International Conference on Autonomous Agents and MultiAgent Systems (AAMAS 2021). London, 2021.
2. RAMOS, Gabriel de O.; **da SILVA, Bruno C.**; RĂDULESCU, Roxana; BAZZAN, Ana L. C. *Toll-Based Reinforcement Learning for Efficient Equilibria in Route Choice*. The Knowledge Engineering Review. Volume 35. Cambridge University Press, 2020.
3. THOMAS, Philip S.; **da SILVA, Bruno C.**; BARTO, Andrew; GIGUERE, Stephen; BRUN, Yuriy; BRUNSKILL, Emma. *Preventing Undesirable Behavior of Intelligent Machines*. In Science, 2019.
4. GARCIA, Francisco M.; **da SILVA, Bruno C.**; THOMAS, Philip S. *A Compression-Inspired Framework for Macro Discovery* (Ext. Abstract). Proceedings of the 18th International Conference on Autonomous Agents and MultiAgent Systems (AAMAS 2019). Canada, 2019
5. GARCIA, Francisco M.; **da SILVA, Bruno C.**; THOMAS, Philip S. *A Compression-Inspired Framework for Macro Discovery*. Workshop on Reinforcement Learning, co-located with the 33rd AAAI Conference on Artificial Intelligence (WRL@AAAI 2019). USA, 2019.
6. WEBER, Aline; MARTIN, Charles P.; TORRESEN, Jim; **da SILVA, Bruno C.** *Identifying Reusable Early-Proceedings of the 9th Joint IEEE International Conference on Development and Learning* (ICDL 2019). Norway, 2019.
7. SANTUCCI, Vieri G.; CARTONI, Emilio; **da SILVA, Bruno C.**; BALDASSARRE, Gianluca. *Autonomous Reinforcement Learning of Multiple Interrelated Tasks*. Proceedings of the 9th Joint IEEE International Conference on Development and Learning and on Epigenetic Robotics (ICDL 2019). Norway, 2019.
8. GARCIA, Rafael; FALCÃO, Alexandre X.; TELEA, Alexandru; **da SILVA, Bruno C.**; TORRESEN, Jim; COMBA, João L. *A Methodology for Neural Network Architectural Tuning Using Activation Occurrence Maps*. Proceedings of the IEEE International Joint Conference on Neural Networks (IJCNN 2019). Hungary, 2019.
9. del VERME, Manuel; **da SILVA, Bruno C.**; BALDASSARRE, Gianluca. *Optimal Options for Multi-Task Reinforcement Learning Under Time Constraints*. Proceedings of the 4th Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM 2019). Canada, 2019.
10. SANTUCCI, Vieri G.; CARTONI, Emilio; **da SILVA, Bruno C.**; BALDASSARRE, Gianluca. *Autonomous Open-Ended Learning of Interdependent Tasks*. Proceedings of the 4th Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM 2019). Canada, 2019.
11. WEBER, Aline; ALEGRE, Lucas; TORRESEN, Jim; **da SILVA, Bruno C.** *Parameterized Melody Generation with Autoencoders and Temporally-Consistent Noise*. Proceedings of the 19th International Conference on New Interfaces for Musical Expression (NIME 2019). Brazil, 2019.
12. LIU, Miao; CHOWDHARY, G.; **da SILVA, Bruno C.**; LIU, Shih-Yuan; HOW, Jonathan P. *Gaussian Processes for Learning and Control: A Tutorial with Examples*. IEEE Control Systems Magazine. Volume 38. IEEE 2018.



13. GARCIA, Rafael; TELEA, Alexandru C.; **da SILVA, Bruno C.**; TORRESEN, Jim; COMBA, João L. *A task-and-technique centered survey on visual analytics for deep learning model engineering*. Computers & Graphics. Volume 77. Elsevier, 2018.
14. RAMOS, Gabriel de O.; **da SILVA, Bruno C.**; RĂDULESCU, Roxana; BAZZAN, Ana L. C. *Learning System-Efficient Equilibria in Route Choice Using Tolls*. Proceedings of the Adaptive Learning Agents Workshop 2018, co-located with the 35th International Conference on Machine Learning (ALA@ICML 2018). Sweden, 2018.
15. GRUNITZKI, Ricardo; **da SILVA, Bruno C.**; BAZZAN, Ana. L. C. *Towards Designing Optimal Reward Functions in Multi-Agent Reinforcement Learning Problems*. Proceedings of the IEEE International Joint Conference on Neural Networks (IJCNN 2018). Brazil, 2018.
16. OLIVEIRA, Thiago B. F.; BAZZAN, Ana L. C.; **da SILVA, Bruno C.**; GRUNITZKI, Ricardo. *Comparing Multi-Armed Bandit Algorithms and Q-Learning for Multiagent Action Selection: a Case Study in Route Choice*. Proceedings of the IEEE International Joint Conference on Neural Networks (IJCNN 2018). Brazil, 2018.
17. RAMOS, Gabriel O.; BAZZAN, Ana L. C.; **da SILVA, Bruno C.** *Analysing the impact of travel information for minimising the regret of route choice*. Transportation Research Part C: Emerging Technologies, Volume 88. 2018.
18. GARCIA, Rafael; **da SILVA, Bruno C.**; COMBA, João L. *Task-Based Behavior Generalization via Manifold Clustering*. IEEE/RSJ Int. Conference on Intelligent Robots and Systems (IROS 2017). Canada, 2017.
19. RAMOS, Gabriel O.; **da SILVA, Bruno C.**; BAZZAN, Ana L. C. *Learning to Minimise Action Regret in Route Choice*. Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2017). Brazil, 2017.
20. GRUNITZKI, Ricardo; **da SILVA, Bruno C.**; BAZZAN, Ana L. C. *A Flexible Approach for Designing Optimal Reward Functions* (Ext. Abstract). Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2017). Brazil, 2017.
21. GARANT, Dan; **da SILVA, Bruno C.**; LESSER, Victor; ZHANG, Chongjie. *Context-Based Concurrent Experience Sharing in Multiagent Systems*. Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2017). Brazil, 2017.
22. THOMAS, Philip; **da SILVA, Bruno C.**; DANN, Christoph; BRUNSKILL, Emma. *Energetic Natural Gradient Descent*. Proceedings of the 33rd International Conference on Machine Learning (ICML 2016). USA, 2016.
23. STEFANELLO, Fernando; **da SILVA, Bruno C.**; BAZZAN, Ana L. C. *Using Topological Statistics to Bias and Accelerate Route Choice: preliminary findings in synthetic and real-world road networks*. Proceedings of the 9th International Workshop on Agents in Traffic and Transportation (ATT), at the 25th International Joint Conference on Artificial Intelligence (IJCAI 2016). USA, 2016.
24. GARANT, Dan; **da SILVA, Bruno C.**; LESSER, Victor; ZHANG, Chongjie. *Accelerating multi-agent reinforcement learning with dynamic co-learning*. Technical Report UM-CS-2015-004. Department of Computer Science, University of Massachusetts Amherst, 2015.
25. BALDASSARRE, Gianluca; MANNELLA, Francesco; SANTUCCI, Vieri; SPERATI, Valerio; CALIGIORE, Daniele; CARTONI, Emilio; **da SILVA, Bruno C.**; MIROLLI, Marco. *Open-Ended Learning of Skills in*

*Robots: Insights from Looking at the Brain*. Proceedings of the 2nd Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM 2015). Canada, 2015.

26. **da SILVA, Bruno C.**; KONIDARIS, George; BARTO, Andrew G. *Active Learning of Parameterized Skills*. Proceedings of the 31st International Conference on Machine Learning (ICML 2014). China, 2014.
27. **da SILVA, Bruno C.**; BALDASSARRE, Gianluca; KONIDARIS, George; BARTO, Andrew G. *Learning Parameterized Motor Skills on a Humanoid Robot*. Proceedings of the 2014 IEEE International Conference on Machine Learning (ICRA 2014). China, 2014.
28. CORKILL, Daniel; ZHANG, Chongjie; **da SILVA, Bruno C.**; KIM, Yoonheui; ZHANG, Xiaoqin; LESSER, Victor. *Biasing the Behavior of Organizationally Adept Agents* (Ext. Abstract). Proceedings of the 12th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2013). USA, 2013.
29. **da SILVA, Bruno C.**; KONIDARIS, George; BARTO, Andrew G. *Learning Parameterized Skills*. Proceedings of the 29th International Conference on Machine Learning (ICML 2012). Scotland, 2012.
30. **da SILVA, Bruno C.**; BARTO, Andrew G. *TD- $\Delta\pi$ : A Model-Free Algorithm for Efficient Exploration*. Proceedings of the 26th Conference on Artificial Intelligence (AAAI 2012). Canada, 2012.
31. **da SILVA, Bruno C.**; BARTO, Andrew G.; KUROSE, J. *Designing Adaptive Sensing Policies for Meteorological Phenomena via Spectral Analysis of Radar Images*. Technical Report UM-CS-2012-006, Department of Computer Science, University of Massachusetts Amherst, 2012.
32. CORKILL, Daniel; ZHANG, Chongjie; **da SILVA, Bruno C.**; KIM, Yoonheui; ZHANG, Xiaoqin; LESSER, Victor. *Using Annotated Guidelines to Influence the Behavior of Organizationally Adept Agents*. 14th International Workshop on Coordination, Organisations, Institutions and Norms (COIN@AAMAS 2012). Spain, 2012.
33. BRANDALERO, Marcelo; MENEGUZZI, Guilherme; OLIVEIRA, Geraldo; GONÇALVES, Larissa; da SILVEIRA, Leonardo; **da SILVA, Bruno C.**; CARRO, Luigi; BECK, Antonio C. *Efficient Local memory support for approximate computing*. VIII Brazilian Symposium on Computing Systems Engineering. (SBESC 2018). Brazil, 2018.
34. BAZZAN, Ana L. C.; OLIVEIRA, Denise; **da SILVA, Bruno C.** *Learning in Groups of Traffic Lights*. In: Journal of Engineering Applications of Artificial Intelligence, 2010.
35. BAZZAN, Ana L. C.; **da SILVA, Bruno C.** *Distributed Constraint Propagation for Diagnosis of Faults in Physical Processes* (Ext. Abstract). Proceedings of the 6th International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS 2007). USA, 2007.
36. **da SILVA, Bruno C.**; BASSO, Eduardo W.; BAZZAN, Ana L. C.; ENGEL, Paulo M. *Dealing with Non-Stationary Environments using Context Detection*. Proceedings of the 23rd International Conference on Machine Learning (ICML 2006). USA, 2006.
37. **da SILVA, Bruno C.**; BASSO, Eduardo W.; BAZZAN, Ana L. C.; ENGEL, Paulo M. *Improving Reinforcement Learning with Context Detection*. Proceedings of the 5th International Joint Conference On Autonomous Agents And Multiagent Systems (AAMAS 2006). Japan, 2006.

38. **da SILVA, Bruno C.**; BASSO, Eduardo W.; BAZZAN, Ana L. C.; ENGEL, Paulo M. *RL-CD: Dealing with Non-Stationarity in Reinforcement Learning* (Student Abstract). Proceedings of the 21st Conference on Artificial Intelligence (AAAI 2006). USA, 2006.
39. **da SILVA, Bruno C.**; JUNGES, Robert; OLIVEIRA, Denise; BAZZAN, Ana L. C. *ITSUMO: an Intelligent Transportation System for Urban Mobility* (Demonstration Track). Proceedings of the 5th International Joint Conference On Autonomous Agents And Multiagent Systems (AAMAS 2006). Japan, 2006.
40. **da SILVA, Bruno C.**; OLIVEIRA, Denise; BASSO, Eduardo W.; BAZZAN, Ana L. C. *Adaptive Traffic Control with Reinforcement Learning*. Proceedings of the 4th Workshop on Agents in Traffic and Transportation (ATT@AAMAS 2006). Japan, 2006.
41. OLIVEIRA, Denise; BAZZAN, Ana L.C.; **da SILVA, Bruno C.**; BASSO, Eduardo W.; NUNES, Luis; ROSSETTI, Rosaldo; OLIVEIRA, Eugénio; da SILVA, Roberto; LAMB, Luis. *Reinforcement Learning based Control of Traffic Lights in Non-stationary Environments: A Case Study in a Microscopic Simulator*. Proceedings of the 4th European Workshop on Multi-Agent Systems (EUMAS 2006). Portugal, 2006.
42. **da SILVA, Bruno C.**; BAZZAN, Ana L. C.; OLIVEIRA, Denise; LOPES, Filipe; ANDRIOTTI, Gustavo K. *ITSUMO: an Intelligent Transportation System for Urban Mobility*. Lecture Notes in Computer Science. Springer-Verlag, 2004.
43. **da SILVA, Bruno C.**; WEBER, Raul Fernando. *TuxGuardian: um firewall de host voltado para o usuário final*. Proceedings of the 2nd Brazilian Symposium on Computer Networks. Brazil, 2004.
44. ALMEIDA, Licurgo B.; **da SILVA, Bruno C.**; BAZZAN, Ana L. C. *Towards a physiological model of emotions: first steps*. Proceedings of the 2004 AAAI Spring Symposium Series. USA, 2004.

## References

1. Professor Andrew G. Barto  
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