

Bruno Castro da Silva

Assistant Professor
Federal University of Rio Grande do Sul (Brazil)
Computer Science Department
Porto Alegre, Brazil. PO Box 15064

bsilva@inf.ufrgs.br
cs.umass.edu/~bsilva

Academic Employment

Assistant Professor
Federal University of Rio Grande do Sul (Brazil)
Computer Science Department

August 2015 – present

Postdoctoral Associate
MIT - Laboratory for Information & Decision Systems
Research on robot learning and control of teams of
quadcopters with Professor Jonathan How

January 2015 – August 2015

Education

PhD, Computer Science
University of Massachusetts at Amherst
Cumulative GPA: 3.935/4.0
Advisor: Prof. Dr. Andrew Barto

Sept 2007 – December 2015

MSc, Computer Science
Universidade Federal do Rio Grande do Sul (Brazil)
Graduate program ranked top 2 in the country.
Cumulative GPA: 4.0/4.0
Advisor: Prof. Dr. Ana Lucia C. Bazzan

March 2005 – March 2007

B.S., Computer Science *cum laude*
Universidade Federal do Rio Grande do Sul (Brazil)
Program ranked top 1 in the country.
Cumulative GPA: 3.8/4.0
Advisor: Prof. Dr. Raul Fernando Weber

March 1999 – March 2004

Research Interests

- Statistical Machine Learning
- Optimal Decision-Making Problems & Reinforcement Learning
- Motor Skills in Robots
- Active Learning & Efficient Sample Collection; Rapid Exploration of Large State Spaces
- Learning of Stochastic and Non-Stationary Models

Selected Publications

[1] 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). New York, USA, 2016.

[2] 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). Sao Paulo, Brazil, 2017.

[3] GRUNITZKI, Ricardo; da SILVA, Bruno C.; BAZZAN, Ana L. C. **A Flexible Approach for Designing Optimal Reward Functions**. Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2017). Sao Paulo, Brazil, 2017.

[4] 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). Sao Paulo, Brazil, 2017.

[5] 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). Beijing, China, 2014.

[6] 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). New York, USA, 2016.

[7] 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). Hong Kong, China, 2014.

[8] da SILVA, Bruno C.; KONIDARIS, George; BARTO, Andrew G. **Learning Parameterized Skills**. Proceedings of the 29th International Conference on Machine Learning (ICML 2012), Edinburgh, Scotland, 2012.

[9] da SILVA, Bruno C.; BARTO, Andrew G. **TD- $\Delta\pi$: A Model-Free Algorithm for Efficient Exploration**. Proceedings of the 25th Conference on Artificial Intelligence (AAAI 2012), Toronto, Canada, 2012.

- [10] CORKILL, Daniel; ZHANG, Chongjie; da SILVA, Bruno C.; KIM, Yoonheui; ZHANG, Xiaoqin; LESSER, Victor. **Biasing the Behavior of Organizationally Adept Agents**. Proceedings of the 12th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2013).
- [11] 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.
- [12] 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), Valencia, Spain, 2012.
- [13] 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.
- [14] BAZZAN, Ana L. C.; da Silva, Bruno C. **Distributed Constraint Propagation for Diagnosis of Faults in Physical Processes**. Proceedings of the 6th International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS 2007). Hawaii, USA, 2007.
- [15] 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), Pittsburgh, Pennsylvania, USA, 2006.
- [16] 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.
- [17] da SILVA, Bruno C.; JUNGES, Robert; OLIVEIRA, Denise; BAZZAN, Ana L. C. **ITSUMO: an Intelligent Transportation System for Urban Mobility**. Proceedings of the 5th International Joint Conference On Autonomous Agents And Multiagent Systems (AAMAS 2006), Japan, 2006.
- [18] 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 2006), 2006.
- [19] 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.
- [20] 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, Gramado, Rio Grande do Sul, Brazil, 2004.
- [21] 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, Palo Alto, California, 2004.

Journal and Conference Reviewing

- Journal of Machine Learning Research (JMLR)
- International Conference on Artificial Intelligence (AAAI)
- International Joint Conference on Artificial Intelligence (IJCAI)
- Conference on Uncertainty in Artificial Intelligence (UAI)
- Journal of Robotics and Autonomous Systems
- International Conference on Intelligent Robots and Systems (IROS)
- IEEE Transactions on Robotics (IEEE T-RO)
- International Conference on Development and Learning (ICDL)
- International Conference on Robotics and Autonomous Systems (ICRA)

Work and Research Experience

Adobe Research Summer 2014

- *Summer 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: **Prof. Victor Lesser**

Istituto di Scienze e Tecnologie della Cognizione, Italy Summer 2013

- *Research Assistant*

Winter 2012

- *Research topics:* Construction of motor skills on a physical humanoid robot

Summer 2011

- Supervisors: **Gianluca Baldassarre; Prof. Andrew Barto**

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: **Prof. Andrew Barto**

Universidade Federal do Rio Grande do Sul (Brazil) Aug 2003 – Feb 2004
- *Research Assistant* (CNPq/DTI Scholarship)
- *Research topics:* Urban traffic optimization
- Supervisor: **Prof. 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: **Prof. 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: **Prof. Benamy Turkienicz**

Teaching Experience

Universidade Federal do Rio Grande do Sul (Brazil) Spring 2017
- *Lecturer/Assistant Professor* for INF01048 Fall 2015
- **Artificial Intelligence**

Universidade Federal do Rio Grande do Sul (Brazil) Spring 20167
- *Lecturer/Assistant Professor* for INF01040 Fall 2015
- **Introduction to Algorithms**

University of Massachusetts at Amherst Fall 2014
- *Teaching Assistant* for CS187:
- **Programming with Data Structures.**
- Supervisor: Prof. Mark Corner, David Barrington

University of Massachusetts at Amherst Spring 2011
- *Teaching Assistant* for CS377, CS291SP: Fall 2010
- **Design of large-scale, high-performance systems.** Spring 2007
- Supervisor: Prof. Mark Corner, Emery Berger

University of Massachusetts at Amherst Fall 2007
- *Teaching Assistant* for CS287:
- **Programming Languages Paradigms**
- Supervisor: Prof. Wendy Lehnert

Universidade Luterana do Brasil (Brazil)

Spring 2006

- *Assistant Professor*, Undergraduate Program

- **Introduction to Algorithms; Computer Networks**

Universidade Federal do Rio Grande do Sul (Brazil)

Fall 2005

- *Teaching Assistant* for INF05005

- **Advanced Artificial Intelligence**

- Supervisor: Prof. Ana Lucia C. Bazzan

Computer Skills and Software Development Experience

- Programming: C, C++, Java, Python, Matlab, QT, OpenGL, SQL
- Robotics & Machine Learning: scientific processing & optimization packages, YARP, ROS
- Systems: UNIX (FreeBSD), Linux (most distributions), Mac OS X, Windows
- Software Development Experience:
 - Software for large-scale digital marketing optimization for Fortune 500 companies;
 - Control software for a humanoid robot with 53 degrees of freedom;
 - Software for control and large-scale optimization of urban traffic;
 - Development of an application-level firewall for the Linux kernel;
 - Medalist in ACM International Collegiate Programming Contests.

Awards and Honors

- Best Senior Program Committee Member - AAMAS 2017
- Outstanding Teaching Assistant Award — University of Massachusetts, 2011
- Brazilian Computer Society Distinguished Student Award. March 2004.
- Graduated *cum laude* in Computer Science, cumulative GPA of 3.8. 2004.
- Academic Distinction in Computer Science Award
Union of Computer Science Companies of Rio Grande do Sul. Brazil, 2004.
- Best student in class of 2003, Computer Science
Universidade Federal do Rio Grande do Sul. Brazil, 2003.
- First honorable mention in the 10th Scientific Fair
Universidade Federal do Rio Grande do Sul/PROPESQ. 2002.
- Bronze medalist in the ACM International Collegiate Programming Contest
South America. (11th place out of around 140 teams). Oct 2001.
- Gold medalist in the ACM International Collegiate Programming Contest
(Site Champions), Southern region - Brazil. 2001.

References

- Andrew Barto - Professor Emeritus
Department of Computer Science, University of Massachusetts at Amherst
barto@cs.umass.edu
- Victor Lesser - Distinguished Professor
Department of Computer Science, University of Massachusetts at Amherst
lesser@cs.umass.edu
- Ana Lucia C. Bazzan - Full Professor
Institute of Computer Science, Universidade Federal do Rio Grande do Sul
bazzan@inf.ufrgs.br