

Gonçalo Cardoso Lopes

Curriculum vitae

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Education

2001–2006 **Licentiate in Computer Science and Engineering**, *Universidade Nova de Lisboa*, Lisbon, 17/20.

Research Experience

- Oct 2010–today **PhD Student**, *Champalimaud Neuroscience Programme*, Lisbon.
Research project investigating the role of cortical motor control under unexpected and changing conditions. Development of new tools and environments for the study of behaviour.
- Jun–Aug 2016 **Research Intern**, *RIKEN BSI Summer Program*, Japan.
Research project investigating learning strategies for robust motor control. Development of data acquisition systems for behavioural and fMRI studies in healthy and stroke patients.
- Apr 2006–Sep 2010 **Researcher, Software Architect**, *YDreams*, Lisbon.
Applied research in natural user interfaces, computer vision, asynchronous and parallel computing, and autonomous agents. Development of rapid prototyping tools and frameworks for Augmented Reality.
- Jan 2006–Sep 2010 **Research Student**, *Centre for Artificial Intelligence (CENTRIA)*, Lisbon.
Active research in logic programming, knowledge representation and reasoning, and frameworks for self-modifying systems.

Teaching Experience

- June 2016 **Teaching Assistant**, *Transylvanian Experimental Neuroscience Summer School (TENSS 2016)*, Pike Lake, Transylvania.
- July 2015 **Teaching Assistant**, *CAJAL Advanced Neuroscience Training Programme on the Behaviour of Neural Systems (CAJAL-BNS)*, Lisbon.
- June 2015 **Teaching Assistant**, *Transylvanian Experimental Neuroscience Summer School (TENSS 2015)*, Pike Lake, Transylvania.

Research Skills

- Design of custom data acquisition and control systems (including closed-loop)
- Fabrication techniques (laser cutter, electronics, structural framing)
- Animal handling and behaviour work
- Electrophysiology in freely moving rodents (Wire bundle, silicon probes and ECoG)
- Lesion and basic histological analysis techniques
- Rat surgical techniques
- Computer vision and signal processing techniques

- o Computer graphics and real-time simulation techniques
- o Version control and software development lifecycle
- o Broad expertise with a number of imperative and declarative programming languages (C/C++, C#, Java, Python, Prolog, etc.)

Social Skills

- Personal skills: Team spirit and a proactive attitude in exploring new solutions and approaches for problems. A constant desire to learn new things and build bridges between biology, engineering, philosophy and art.
- Communication skills: Passionate teaching and public communication skills (e.g. see TEDx Lisbon 2015). Ability to adapt to diverse multicultural environments gained through several stays abroad (Europe, U.S.A. and Japan).

Languages

- Portuguese Native
- English Fluent
- French Basic
- Japanese Basic

Publications

Articles in Preprint

Gonalo Lopes, Joana Nogueira, Joseph J. Paton, and Adam R. Kampff. "A robust role for motor cortex". In: *bioRxiv* (2016). DOI: 10.1101/058917.

Articles in Scientific Journals

Joana P Neto, Gonalo Lopes, Joo Frazo, Joana Nogueira, Pedro Lacerda, Pedro Baio, Arno Aarts, Alexandru Andrei, Silke Musa, Elvira Fortunato, Pedro Barquinha, and Adam R Kampff. "Validating silicon polytrodes with paired juxtacellular recordings: method and dataset". In: *Journal of Neurophysiology* 116.2 (2016), pp. 892–903. DOI: 10.1152/jn.00103.2016.

Elena Dreosti, Gonalo Lopes, Adam R. Kampff, and Stephen W. Wilson. "Development of social behaviour in young zebrafish". In: *Frontiers in Neural Circuits* 9.39 (2015). DOI: 10.3389/fncir.2015.00039.

Gonalo Lopes, N Bonacchi, J Frazo, JP Neto, BV Atallah, S Soares, L Moreira, S Matias, PM Itskov, PA Correia, RE Medina, L Calcaterra, E Dreosti, JJ Paton, and AR Kampff. "Bonsai: An event-based framework for processing and controlling data streams". In: *Frontiers in Neuroinformatics* 9.7 (2015). DOI: 10.3389/fninf.2015.00007.

Gonalo Lopes and Adam R. Kampff. "Cortical Control: Learning from the Lamprey". In: *Current Biology* 25.2003 (2015), R203–R205. DOI: 10.1016/j.cub.2015.01.020.

Pavel M. Itskov, Jos-Maria Moreira, Ekaterina Vinnik, Gonalo Lopes, Steve Safarik, Michael H. Dickinson, and Carlos Ribeiro. "Automated monitoring and quantitative analysis of feeding behaviour in *Drosophila*". In: *Nature Communications* 5 (Aug. 2014), p. 4560. DOI: 10.1038/ncomms5560.

Luís Moniz Pereira, Pierangelo Dell'Acqua, Alexandre M. Pinto, and Gonçalo Lopes. "Inspecting and Preferring Abductive Models". In: *Handbook on Reasoning-based Intelligent Systems* (2013), pp. 243–274. DOI: 10.1142/9789814329484_0010.

Luís Moniz Pereira and Gonçalo Lopes. "Prospective Logic Agents". In: *International Journal of Reasoning-based Intelligent Systems* 1.3/4 (2009), pp. 200–208. DOI: 10.1504/IJRIS.2009.028019.

Articles in Conference Proceedings

Gonçalo Lopes and Luís Moniz Pereira. "Prospective Storytelling Agents". In: *Procs. of the 12th Intl. Symp. Practical Aspects of Declarative Languages*. Ed. by M. Carro and R. Peña. Madrid, Spain: Springer, 2010, pp. 294–296. DOI: 10.1007/978-3-642-11503-5_24.

A. Almada, Gonçalo Lopes, A. Almeida, J. Frazão, and Nuno Cardoso. "YVision: A General Purpose Software Composition Framework". In: *Human-Computer Interaction. New Trends. 13th International Conference, HCI International*. Ed. by Julie A. Jacko. San Diego, CA, USA: Springer, 2009, pp. 779–788. DOI: 10.1007/978-3-642-02574-7_87.

Luís Moniz Pereira, Pierangelo Dell'Acqua, and Gonçalo Lopes. "On Preferring and Inspecting Abductive Models". In: *Procs. of the 11th Intl. Symp. Practical Aspects of Declarative Languages*. Ed. by A. Gill and T. Swift. Savannah, Georgia, USA: Springer, 2009, pp. 1–15. DOI: 10.1007/978-3-540-92995-6_1.

Luís Moniz Pereira and Gonçalo Lopes. "Prospective Logic Agents". In: *Progress in Artificial Intelligence, Proc. of the 13th Portuguese Intl. Conf. on Artificial Intelligence*. Ed. by J. M. Neves, M. F. Santos, and J. M. Machado. Guimarães, Portugal: Springer, 2007, pp. 73–86. DOI: 10.1007/978-3-540-77002-2_7.

Luís Moniz Pereira, Gonçalo Lopes, and Pierangelo Dell'Acqua. "Pre and Post Preferences over Abductive Models". In: *Proc. of the 3rd Multidisciplinary Workshop on Advances in Preference Handling at 33rd Intl. Conf. on Very Large Data Bases*. Ed. by J. Delgrande and W. Kießling. Vienna, Austria, 2007.

Gonçalo Lopes and Luís Moniz Pereira. "Prospective Logic Programming with ACORDA". In: *Proc. of the FLoC'06 Workshop on Empirically Successful Computerized Reasoning, 3rd Intl. Joint Conf. on Automated Reasoning*. Ed. by G. Sutcliffe, R. Schmidt, and S. Schulz. Seattle, USA, 2006, pp. 141–160.

Book Chapters

Luís Moniz Pereira, Pierangelo Dell'Acqua, and Gonçalo Lopes. "Prospective Updating of Theories with Preferences". In: *Abduction and the Process of Scientific Discovery*. Ed. by O. Pombo and A. Gerner. Publidisa, 2007, pp. 65–96.

Patents

Gonçalo C. Lopes, A.R.S.P. de Almeida, J.P.G. da Silva Frazão, A.B.C.V. de Almada, N.R.S. Cardoso, and I. de Almeida Soares Franco. *Various elements and apparatuses for an advanced programming platform and other related systems*. US Provisional Utility Patent Application 61/308,709. 2010.

Gonçalo C. Lopes, J.P.G. da Silva Frazão, A.R.S.P. de Almeida, N.R.S. Cardoso, I. De Almeida Soares Franco, and N.M.S. Cruces. *Various methods and apparatuses for achieving augmented reality*. US Patent 8,405,680. 2010.

Gonalo C. Lopes, A.R.S.P. de Almeida, J.P.G. da Silva Frazo, A.B.C.V. de Almada, N.R.S. Cardoso, and I. de Almeida Soares Franco. *Systems and methods for simulating three-dimensional virtual interactions from two-dimensional camera images*. US Patent 8,624,962. 2009.

Gonalo C. Lopes, J.P.G. da Silva Frazo, A.R.S.P. de Almeida, N.R.S. Cardoso, A.B.C.V. de Almada, and I. de Almeida Soares Franco. *Systems and methods for inputting transient data into a persistent world*. US Patent App. 12/836,975. 2009.

■ Diploma Thesis

title *A Computational Approach to Introspective Consciousness in Logic Programming: ACORDA*

supervisors Lus Moniz Pereira

description A translation of cognitive science models of introspective reasoning into a working logic programming framework for evolving agents, employing several state-of-the-art research results in semantics, knowledge representation and reasoning, updates and preferences.

■ Awards

- 2012 **2nd place at the Microsoft Imagine Cup National Final**, *Project NAVI*.
Developed control software for an inexpensive augmented telepresence robotic platform with simultaneous localization and mapping (SLAM) and remote control via Skype with adjustable autonomy.
- 2010 **Multimedia National Prize in Art and Culture**, *.txt*.
Developed the software used for real-time interaction of a simulated particle physics system with the performer on stage.
- 2009 **Multimedia National Prize in Entertainment**, *Lively Dreams*.
Developed the software used for real-time interaction of simulated 3D environments with the dancer on stage.
- 2006 **National Prize for Artificial Intelligence Theses (TLelA)**, *Diploma Thesis*.