INSTITUTE FOR SYSTEMS AND ROBOTICS

Annual Report – 2013

Lisbon Pole

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1. EXECUTIVE SUMMARY

During the year of 2013 there <u>were no research and technological activities taking place in the framework of the Lisbon Pole of ISR, nor were financed through ISR (NIF 502 854 227)</u>. All the research activities were carried out in the context of the research unit ISR/IST where all contracts and activities took place at Instituto Superior Técnico.

For informative purposes only, we describe the scientific publications and Theses that were produced by the research group hosted at the Instituto Superior Técnico, in spite of the fact that none of these activities were developed in the context the Lisbon Pole of ISR.

Contents

2. PUBLICATIONS

a) PhD Theses (12)

1. Bruno Guerreiro, Sensor-based Control and Localization of Autonomous Vehicles in Unknown Environments, Ph.D. Thesis, Instituto Superior Técnico, Universidade Técnica de Lisboa, December, 2013

2. Jonas Hörnstein, Developmental Approach to Early Language Learning in Humanoid Robots, Ph.D. Thesis, Instituto Superior Técnico, Universidade Técnica de Lisboa, March, 2013

3. Jonas Ruesch, A Computational Approach on the Co-Development of Visual Sensorimotor Structures, Ph.D. Thesis, Instituto Superior Técnico, Universidade Técnica de Lisboa, April, 2013

4. Aamir Ahmad, An Integrated Bayesian Approach to Multi-Robot Cooperative Perception, Ph.D. Thesis, Instituto Superior Técnico, Universidade Técnica de Lisboa, April, 2013.

5. Dragana Bajovic, Large Deviations Rates for Distributed Inference, Ph.D. Thesis, Instituto Superior Técnico, Universidade Técnica de Lisboa, 2013

6. Dusan Jakovetic, Distributed Optimization: Algorithms and Convergence Rates, Ph.D. Thesis, Instituto Superior Técnico, Universidade Técnica de Lisboa, 2013

7. Bruno Lacerda, Supervision of Discrete Event Systems Based on Temporal Logic Specifications, Ph.D. Thesis, Instituto Superior Técnico, Universidade Técnica de Lisboa, September, 2013 .

8. Ricardo Beira, Dexterous Mechanical Systems for Intuitive Telemanipulation in Minimally Invasive Surgery, Ph.D. Thesis, within the IST-EPFL Joint Doctoral Initiative, February, 2013

9. Pinar Oguz-Ekim, Robust Localization Algorithms in Sensor Networks with an Application of Target Tracking, Ph.D. Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

10. Urbain Prieur, High-level planning of dexterous in-hand manipulation using a robotic hand, Ph.D. Thesis, Instituto Superior Técnico, Universidade de Lisboa, Portugal, and Université Pierre et Marie Curie, Paris, France, September, 2013

11. Inês de Sousa, Quantitative methods for functional magnetic resonance im, Ph.D. Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

12. João Mota, Communication-Efficient Algorithms For Distributed Optimization, Ph.D. Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

1. Luís Frazão, Automatic diagnosis of melanoma from dermoscopy images using texture, color and dermoscopic structure analysis, Master Thesis, Instituto Superior Técnico, Universidade Técnica de Lisboa, 2013

2. António Santos, Attitude Control for a Group of Space Vehicles, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

3. Ricardo Lucas, Building World Representations using Color-Depth Cameras, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

4. Tiago Castanheira, Multitasking of Smart Cameras, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

5. Nuno Ribeiro, Nomadic Surveillance Camera, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

6. João Tomaz, Visual Self-Localization and Mapping Using the Inside Texture of a Tubular Structure, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

7. André Carreira, Volumetrics - Measuring Free Volumes, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013.

8. Rui Coelho, Planning Push and Grasp Actions: Experiments on the iCub Robot, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

9. Miguel Serafim, Ball Handling Mechanisms for Mobile Robots, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

10. João Cabral, Kinect-Based Algorithms for Motion Analysis, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

11. Tiago Carreira, Quadcopter Automatic Landing on a Docking Station, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

12. Diogo Rolo, Graph-based 6D SLAM for RGB-D Sensors and Hybrid Vision and Depth Camera Localization, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

13. Joel Reis, Advanced Signal Processing Aiding Techniques for Inertial Navigation Systems , Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

14. Marta Ribeiro, Development of a Portable Underwater Tool to Track Marine Animals, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

15. Filipe Morais, An Advanced Navigation System for Remotely Operated, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

16. Ana Cristina Maia, Sensor-Based Formation Control of Autonomous Robotic Vehicles, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

17. André Gonçalves, Motion Planning for Multiple Autonomous Robotic Vehicles: an Application of Optimal Control Theory, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

18. Miguel Ribeiro, Computer Based Cooperative Motion Planning, Programming, and Control of Autonomous Robotic Vehicles, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

19. Carlos Santos, Optimal Single-Beacon Underwater Target Tracking, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

20. Nuno Maia, Cooperative navigation of multiple Marine Robotic Vehicles, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

21. Pedro Pereira, Three Dimensional Trajectory Planner for Real Time Leader Following, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

22. Nuno Carvalho, Nonlinear Marine Animals Tracking System from Multiple USBL/INS Units , Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

23. Juliana Rodrigues, Mapping brain functions using resting-state fMRI: application in the presurgical assessment of epilepsy patients, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

24. Márcia Santos, Identification of Arterial Spin Labelling Perfusion Imaging Biomarkers in Dementia, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

25. Inês Almeida, Real-time Control of Plasma Instabilities, Master Thesis, Instituto Superior Técnico, Universidade de Lisboa, 2013

c) Books and book chapters (9)

1. "Computational Intelligence", K. Madani, A. D. Correia, Agostinho Rosa, J. Filipe, (Eds.), Springer Series: Studies in Computational Intelligence, Vol. 465, 1st Edition, Hardcover ISBN: 978-3-642–35637-7 (Print), 978-3-642-35638-4 (Online), 2013.

2. Carlos Fernandes, J. Laredo, J. J. Merelo, C. Cotta, Agostinho Rosa, "Adapting the Bak-Sneppen Model to a Dynamic and Partially Connected Grid of Hierarchical Species", Advances in Artificial Life, P. Lio, O. Miglino, G. Nicosia, S. Nolfi, M. Pavone (eds), pp. 523-530. MIT Press, Ebook ISBN: 9780262317092, 2013.

3. P. Rodrigues, A. Belguinha, C. Gomes, P. Cardoso, T. Vilas, R. Mestre, João Rodrigues, Open Source Technologies Involved in Constructing a Web-Based Football Information System, In Á. Rocha, A.

M. Correia, T. Wilson, & K. A. Stroetmann (Eds.), Advances in Information Systems and Technologies SE – 66, vol. 206, pp. 715–723. Springer Berlin Heidelberg. Doi:10.1007/978-3-642-36981-0_66, 2013. http://w3.ualg.pt/~jrodrig/papers_pdf/WCIST2013.pdf

4. F. J. A. S. Barriga, J. M. R. S. Relvas, R. S. Santos, A. Pascoal, "Ciência e Recursos Naturais Debaixo do Mar Profundo", In: O Mar na História, na Estratégia e na Ciência. Fundação Luso-Americana e Tinta-da-China, pp 187-196, 2013.

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5. Rodrigo Ventura, "New Trends on Medical and Service Robots: Challenges and Solutions", chapter Two Faces of Human-robot Interaction: Field and Service robots. MMS. Springer, submitted in 2013, in press.

6. C.M. Fernandes, J.J. Merelo, A.C.Rosa, "A Time-Varying Inertia Weight Strategy for Particles Swarms Based on Self-Organized Criticality" (Fevereiro 2012) no Studies in Computational Intelligence (IJCCI 2012 revised selected papers), Springer-Verlag 2014.

7. C.M. Fernandes, A.M. Mora, J.J. Merelo, A.C.Rosa, "Photorealistic rendering with an Ant Algorithm" (Fevereiro 2012) no Studies in Computational Intelligence (IJCCI 2012 revised selected papers), Springer-Verlag 2014.

8. N. Leite, R. Neves, N. Horta, F. Melıcio, A. Rosa, "Solving an Uncapacitated Exam Timetabling Problem Instance using a Hybrid NSGA-Iin" (Fevereiro 2012) no Studies in Computational Intelligence, (IJCCI 2012 revised selected papers), Springer-Verlag 2014.

9. N. Leite, F. Melício, A. Rosa, "Solving the Examination Timetabling Problem with the Shuffled Frog-leaping Algorithm" (October de 2013) no "Studies in Computational Intelligence", (IJCCI 2013 revised selected papers), Springer-Verlag 2015.http://www.springer.com/computer/lncs?SGWID=0-164-6-793341-0.

d) − Publicatioons in international journals (63)

1. Alberto Vale, Daniel Fonte, Filipe Valente, João Ferreira, Isabel Ribeiro, Carmen Gonzalez, "Flexible Path Optimization for the Cask and plug Remote Handling System", Fusion Engineering and Design, Elsevier, Vol. 88, pps. 1900-1903, 2013, http://dx.doi.org/10.1016/j.fusengdes.2013.02.095

2. João Ferreira, Alberto Vale, Isabel Ribeiro, "Localization of Cask and Plug Remote Handling System in ITER", Fusion Engineering and Design, Elsevier, Vol.88, pp. 1992-1996, 2013, http://dx.doi.org/10.1016/j.fusengdes.2012.10.008

3. C. Bispo, "The single-server scheduling problem with convex costs", Queuing Systems, Vol. 73, No. 3, pp. 261-294, March 2013, DOI 10.1007/s11134-012-9316-8.

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5. J. Mendes, Rodrigo Ventura, "Assisted teleoperation of quadrotors using obstacle avoidance", Journal of Automation, Mobile Robotics & Intelligent Systems, 6(1):54–58, 2013.

6. P. Silva, "Fabulosas raças de humanóides: monstros e robôs. A robótica humanóide e a captura da intencionalidade", Kairos – Journal of Philosophy & Science, 7, pp. 87-111, September 2013.
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7. Alonso-Martín, F. and Malfaz, M. and Sequeira, J. and Gorostiza, J.F. and Salichs, M.A., "A multimodal emotion detection system during human-robot interaction", Sensors (Switzerland), 13(11):15549-15581, 2013.
    http://www.scopus.com/inward/record.url?eid=2-s2.0-84887740934&partnerID=MN8TOARS

8. P. Vieira, Rodrigo Ventura, "Interactive mapping using range sensor data under localiztion uncertainty", Journal of Automation, Mobile Robotics & Intelligent Systems, 6(1):47–53, 2013, URL: http://welcome.isr.ist.utl.pt/img/pdfs/2828_jamris2013pv.pdf

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11. Silva, J.B. and Santos, C.P. and Sequeira, J., "Timed trajectory generation combined with an extended kalman filter for a vision-based autonomous mobile robot", Advances in Intelligent Systems and Computing vol 1, pp: 67-79, 2013.
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12. Almeida, J. and Dias, A. and Martins, A. and Sequeira, J. and Silva, E., "Distributed active traction control system applied to the robocup middle size", International Journal of Advanced Robotic Systems, vol. 10, 2013.
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15. Bruno Nery, Rodrigo Ventura, "On the scalability and convergence of simultaneous parameter identification and synchronization of dynamical systems." Complex Systems, 22(3):203–219, 2013.

16. Jonas Ruesch, Ricardo Ferreira, Alexandre Bernardino, "A computational approach on the co-development of artificial visual sensorimotor structures", Adaptive Behaviour 21(6): 452-464, 2013, http://welcome.isr.ist.utl.pt/img/pdfs/3185_adaptive_behavior.pdf.

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27. Pedro Casau, David Cabecinhas, Carlos Silvestre, "Hybrid Control Strategy for the Autonomous Transition Flight of a Fixed-Wing Aircraft", IEEE Transactions on Control Systems Technology, Vol. 21, No. 6, pp. 2194-2211, November, 2013.
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28. Sérgio Brás, Paulo Rosa, Carlos Silvestre, Paulo Oliveira, "Global Attitude and Gyro Bias Estimation Based on Set-Valued Observers", Elsevier Systems and Control Letters, Vol. 62, Issue 10, pp. 937-942, October, 2013. http://welcome.isr.ist.utl.pt/img/pdfs/3274_IJ053.pdf

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36. Paulo Rosa, Carlos Silvestre, "Multiple-Model Adaptive Control using Set-Valued Observers", International Journal of Robust and Nonlinear Control, Published online DOI: 10.1002/rnc.3005, 2013. http://welcome.isr.ist.utl.pt/img/pdfs/3270_IJ060.pdf

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37. Susana Dias Brandão, M. Veloso, João Paulo Costeira,"Probabilistic Object Identification through On-Demand Partial Views", VISIGRAPP 2014 - 9th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications, Lisbon, Portugal, 2014