

Jorge Manuel Miranda Dias

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Jorge Dias has a Ph.D. on Electrical Engineering by the University of Coimbra, specialization in Control and Instrumentation. Jorge Dias teaches in the Department of Electrical Engineering and Computers (www.deec.uc.pt) and researches in the Institute of Systems and Robotics (ISR) (www.isr.uc.pt) from the University of Coimbra (UC) (www.uc.pt). Jorge Dias has research activities in the area of Computer Vision and Robotics and contributions on the field since 1984. He has several publications in books, international journals, and international conferences. Jorge Dias has been teaching several courses on Computer Vision, Robotics, Automation, he supervised several Ph.D. students in the topics of Computer Vision and Robotics. Jorge Dias was been principal investigator from international research projects in cooperation with European Universities and Research Institutions. Jorge Dias coordinates the Mobile Robotics Laboratory of ISR and is director of Laboratory of Systems and Automation (LAS) (<http://las.ipn.pt>) from the Instituto Pedro Nunes (IPN) (www.ipn.pt) – a technology transfer institute linked to University of Coimbra.

An updated version of current activities is available in the link www.deec.uc.pt/~jorge .

Education

- Ph.D. on Electrical Engineering by the University of Coimbra, specialization in Instrumentation and Control, November 1994.
- Thesis of Scientific and Pedagogical Ability from the Faculty of Science and Technology from the University of Coimbra, February 1988.
- Electrical Engineer Degree (specialization on Computers) by the Faculty of Science and Technology from the University of Coimbra on July 1984.

Academic And Research Activity

Associated Professor (tenure position) from the Department of Electrical Engineering and Computers (DEEC) from Faculty of Sciences and Technology (FCT), University of Coimbra (UC) – since 2002

Auxiliary Professor from the DEEC – University of Coimbra – November/1994 to May/2002

Assistant Professor from the DEEC – University of Coimbra – October/1988 to November de 1994

Assistant from the DEEC – University of Coimbra from December 1984 to February 1988

Researcher at ISR- Institute of Systems and Robotics from University of Coimbra since 1992.

Courses and Teaching

Jorge Dias has been responsible for the supervision of PhD and Master students. He has been teaching several courses at Master and Doctoral level for the Department of Electrical Engineering and Computers (DEEC) from the Faculty of Science and Technology (FCT) from the University of Coimbra (UC) and ETSI Telecomunicación, University of Malaga (UMA), Spain.

Doctoral Course on Electrical Engineering and Computers at DEEC-FCT-UC

- Autonomous Robotic Systems (Sistemas Robóticos Autónomos)
- Volumetric Image Analysis (Análise de Imagens Volumétricas)

Programas de Dotorado from ETSI Telecomunicación- University of Málaga, Spain

- Since 2006 Jorge Dias started collaborating with the ETSI from University of Malaga for teaching classes on Programas de Dotorado, TEMAS EN ROBÓTICA AUTÓNOMA MÓVIL, Universidad Malaga, Spain.

Master on Engineer Engineering and Computers at DEEC-FCT-UC

- Microprocessor Systems (Sistemas de Microprocessadores)
- Project of Advanced Digital Systems (Projecto de Sistemas Digitais)
- Computers Technology (Tecnologia de Computadores)
- Digital Electronics (Electrónica Digital)

Master on Biomedical Engineering Course at FCT-UC

- Signal and Systems (Sinais e Sistemas)
- Computer Vision and Biological Vision (Visão por Computador e Visão Biológica) (50% in cooperation with Faculty of Medicine)

Supervision of Thesis

Former of PhD students

- “Exploiting inertial sensing in mosaicing and aerial visual navigation”, Luiz Gustavo Mirisola, March 2009
- “Robot-Human Interface Using Laban Movement Analysis Inside A Bayesian Framework”, Jörg Rett, January 2009
- “Autonomous Navigation And Multi-Sensorial Real-Time Localization For A Mobile Robot”, Caetano Filipe Costa de Noronha Ferreira, Co-supervision with Vitor Santos (DEM-Univ. Aveiro), September 2008
- “New Methodologies for Multimodal Image Mapping of Eye Macula”, Rui Bernardes Dias Cortesão, Co-supervision José Guilherme Fernandes da Cunha-Vaz (Faculty of Medicine), July 2008
- “Multi-Cue Visual Tracking for Human-Robot Interaction”, Paulo Jorge Carvalho Menezes, January, 2007
- “Integration of Vision and Inertial Sensing”, Jorge Nuno de Almeida e Sousa Lobo, January 2007
- “Building Volumetric Maps with Cooperative Mobile Robots and Useful Information Sharing - A Distributed Control Approach based on Entropy”, Rui Paulo Pinto da Rocha, Co-supervision Adriano Carvalho (FEUP), May 2006

Current supervision of PhD students

- “Small Group Conversation Behavior Analysis using Laban Movement Analysis”, Luis Carlos Santos, started on January 2009
- “Probabilistic Human Behavior Understanding Using Multi-Modal Tracking and LABAN Movement Analysis”, Kamrad Khoshhal Roudposhti, started on January 2009
- “Multi-Ocular and Multi-sensor Tracking and Behavior Analysis”, Hadi Aliakbarpour, started on October 2007
- “Bayesian Techniques for Artificial Perception” José Augusto Soares Prado, started on October 2007
- “Recognition of Human Facial Expressions for Human - Robot Interface”, Carlos Manuel Cerqueira Simplicio, started on March 2007
- “Robot-Programming & Learning By Imitation Using Vision”, Diego Resende Faria, started on December 2006
- “Cognitive Functional Mapping by using fMRI images and EEG Signals”, José Eduardo Figueiredo Lima Rebola, co-supervision with Miguel Castelo Branco (Faculty of Medicine), started on December 2006
- “Bayesian Cognitive Models for 3D Structure and Motion Multi-Modal Perception”, João Filipe de Castro Cardoso Ferreira, co-supervision with Miguel Castelo Branco (Faculty of Medicine), started on October 2005

The details about students and PhD studies are available at www.deec.uc.pt/~jorge and <http://paloma.isr.uc.pt/mr/1/>.

Scientific Projects

Jorge Dias has been exploring different topics on Robot Vision, Autonomous Robotics and also Medical Imaging. All these subjects have been explored towards the improvement of methods, algorithms and techniques for more autonomous robotic platforms, artificial vision systems and multimodal/multi-sensorial image analysis. Jorge Dias is principal investigator (Portuguese team) for the current European projects in cooperation:

- BACS - Bayesian Approach to Cognitive Systems - 6th Framework Programme of the European Commission.
- IRPS - Intelligent Robotic Porter System - 6th Framework Programme of the European Commission.
- PROMETHEUS: Prediction and interpretation of human behavior based on probabilistic structures and heterogeneous sensors - 7th Framework Programme of the European Commission.
- HANDLE - Developmental Pathway towards Autonomy and Dexterity in Robot In-Hand Manipulation - 7th Framework Programme of the European Commission – Priority Information Society Technologies.

Jorge Dias has a total 8 international cooperation projects (4 active) 7 supported by European Commission and as Principal Investigator. He was Principal Investigator of 8 national projects .

The details about these and other projects are available at www.deec.uc.pt/~jorge and <http://paloma.isr.uc.pt/mrl/> and <http://las.ipn.pt>

Cooperation within Scientific Community

Jorge Dias was:

- Co-editor 3 Special Issues on International Journals (“Integration of Visual and Inertial Sensors”, Journal of Robotic Systems 21 (1 e 2) 2004, Wiley InterScience) and (The International Journal of Robotics Research, June 2007, Volume 26, No. 6).
- Member of Organizing Committee of IROS 2002, RoboCup 2004, AMC 1998, ICAR 2003, RECPAD 92, RECPAD 97, CONTROLO 98, SIRS'99 and main organizer of international Workshop on Field Robotics (IROS 2002), INERVIS 03 (ICAR 2003), INERVIS 05 (ICRA 2005), Workshop on Vision Based Human-Robot Interaction (EUROS-2006), Grasp and task learning by imitation (IROS 2008).
- Program committee member of IROS, ICRA, M2VIP, IAV, ECMR, EUROPEAN ROBOTICS SYMPOSIUM (EUROS), Complmage, ROBOTICA, IFAC, ICIAR, ISR, IMAGAPP, IASTED, IROBOT, IBERAMIA, ICINCO, VISAPP, IRMA, OPTIM, INERVIS, RoboCup, ICOM, CCA, ICOM, RECPAD, RET, EUROBOT, RECPAD, M2VP'2000, M2VIP'99 conferences.
- Co-organizer of International Courses and Summer Schools in Europe: Summer School on Mobile Robotics Navigation, EURON – European Robotics Research Network, September 3-7, 2001, EPFL, Lausanne, Switzerland, SLAM - Summer School on Mobile Robotics Navigation, EURON – European Robotics Research Network, August 5-9, 2002, KTH, Stockholm, Sweden
- Active reviewer from international journals in robotics (IEEE-RAS, Robotics and Automation, Robotics Research, IEEE SMC, Artificial Intelligence, IEEE Transactions on Robotics, EURASIP - Journal on Embedded Systems, Intelligent and Robotic Systems, Real-Time Image Processing, Pattern Recognition, ASME - Journal of Biomechanical Engineering, International Journal of Information Sciences, Machine Vision Applications).

Professional Activities

- Coordinator of Mobile Robotics Laboratory (MRL) from the ISR– UC <http://paloma.isr.uc.pt>
- President elected for Scientific Council of the (DEEC) from Dec. 2005 – March 2008. www.deec.uc.pt
- Director of LAS-Lab. for Systems and Automation from IPN – Inst. Pedro Nunes (UC) <http://las.ipn.pt>
- Vice-President of IPN – Institute Pedro Nunes (for technology transfer) since June 2008 www.ipn.pt
- Vice-President of IPN INCUBADORA (companies incubator) since June 2008 www.ipn-incubadora.pt

Selected Short List of Publications

- L. Mirisola, J. Dias, “Tracking a Moving Target from a Moving Camera with Rotation-Compensated Imagery”, in Intelligent Aerial Vehicles, Chapter XVIII, ed. Thanh Mung Lam, In-Tech, Austria, ISBN: 978-953-7619-41-1, January 2009

- Joerg Rett, Jorge Dias and Juan-Manuel Ahuactzin, "Laban Movement Analysis using a Bayesian model and perspective projections", in Brain, Vision and AI, Chapter X, ed. Cesare Rossi, IN-TEH, Austria, ISBN:978-953-7619-04-6, first edition, August 2008 (<http://www.in-teh.org>)
- A. Moutinho, L. Mirisola, J.R. Azinheira, J. Dias, "Project DIVA: Guidance And Vision Surveillance Techniques For an Autonomous Airship", in Robotics Research Trends, Chapter II, Nova Publishers, ISBN: 1-60021-997-7 Hardcover 2008 (https://www.novapublishers.com/catalog/product_info.php?products_id=6118)
- J. B. Santos, D. Celorico, J. Varandas, J. Dias, "Medical interface for echographic free-hand images", in Computational Vision and Medical Image Processing, Chapter VII, ed. J.Tavares & N. Jorge, Taylor & Francis Group, Viplmage, ISBN 978-0-415-45777-4, London, 2007.
- R. Rocha and J. Dias "Efficiently Sharing Information in Cooperative Multi-Robot Systems". In Ned Kock editor, Encyclopedia of E-Collaboration, Information Science Reference (formerly Idea Group Reference), Hershey, New York, ISBN 978-1-59904-000-4 (hardcover), ISBN 978-1-59904-000-1 (ebook), pages 561-568, Dec. 2007 (<http://www.igi-pub.com/reference/details.asp?ID=6952>)
- R. Rocha, J. Dias, A. Cunha and J. Varandas. "Towards a New Mobility Concept for Cities: Architecture & Programming of Semi-Autonomous Electric Vehicles". Industrial Robot, 34(2), Emerald journals, ISSN 0143-991X, pages 142-149, Mar. 18, 2007. (www.emeraldinsight.com)
- Peter Corke, Jorge Lobo, Jorge Dias, "An Introduction to Inertial and Visual Sensing", The International Journal of Robotics Research, 2007, 26: 519-535.
- Jorge Lobo and Jorge Dias, "Relative Pose Calibration Between Visual and Inertial Sensors", The International Journal of Robotics Research, 2007, 26: 561-575.
- Filipe Ferreira, Luis Davim, Rui Rocha, Jorge Dias, Vítor Santos, "Presenting A Technique For Registering Images And Range Data Using A Topological Representation Of A Path Within An Environment", JAMRIS - Journal of Automation, Mobile Robotics & Intelligent Systems, V1, N° 3, September 2007
- Rui Bernardes, Jorge Dias, José Cunha-Vaz, "Mapping the Human Blood-Retinal Barrier Function", IEEE Transactions On Biomedical Engineering, Jan. 2005, pp 106- 116, Volume: 52, Issue: 1
- Rui Rocha, Jorge Dias, Adriano Carvalho, "Cooperative multi-robot systems: A study of vision-based 3-D mapping using information theory ", Robotics and Autonomous Systems 53 (2005) 282–31, Elsevier.
- Jorge Lobo, Jorge Dias, "Inertial Sensed Ego-motion for 3D Vision", Journal of Robotic Systems 21(1), (2004) © 2004 Wiley Periodicals, Inc.
- Nuno Martins, Jorge Dias, "Camera calibration using reflections in planar mirrors and object reconstruction using volume carving method", The Imaging Science Journal (2004), Vol 52, UK, pp117-130
- Joaquim Varandas, Pedro Batista, Jaime Santos, Jorge Dias, "VOLUS - A visualization system for 3D ultrasound data", Ultrasonics Journal (2004), V42, pg 689-694, 2004, Elsevier
- Jorge Lobo, Carlos Queiroz, Jorge Dias, WORLD FEATURE DETECTION AND MAPPING USING STEREOVISION AND INERTIAL SENSORS, Robotics and Autonomous Systems Journal, 44(1), pg 69-81, July 2003, Elsevier, ISBN 0921-8890
- Jorge Lobo, Jorge Dias, Vision and Inertial Sensor Cooperation – Using Gravity as a Vertical Reference, IEEE PAMI Transactions on Pattern Analysis and Machine Intelligence, (Vol 25, No.12) December 2003, IEEE Press, p p. 1597-1608
- J. Alves and J. Dias, "Design and control of a spherical mobile robot", Journal of Systems and Control Engineering, Vol. 217 Part I, 2003 Institute of Mech. Engineers, UK
- João Alves , Jorge Lobo and Jorge Dias , "Camera-Inertial Sensor Modelling and Alignment for Visual Navigation", Machine Intelligence & Robotic Control, Vol. 5, No. 3, 103–111 (2003)
- J. Dias, C. Paredes, I. Fonseca, H. Araújo, J. Batista, and A. T. Almeida, "Simulating Pursuit with Machine Experiments with Robots and Artificial Vision", IEEE Transactions on Robotics and Automation, Vol3, No 1, February 1998, pp. 1-18
- J. Dias, H. Araújo, C. Paredes, J. Batista, "Optical Normal Flow Estimation on Log-polar Images. A solution for Real-Time Binocular Vision", Real-Time Imaging Journal, 3, 1997, pp. 213-228

Jorge Dias has a total of 12 Book Chapters with referees, 23 International Journal papers, and more than 164 articles in conferences with referees.

The details of the most recent projects and publications are available at www.deec.uc.pt/~jorge and <http://paloma.isr.uc.pt/mrl/>.