

**DEPARTAMENTO DE**  
**INGENIERIA DE SISTEMAS Y**  
**AUTOMATICA**

**DEPARTAMENTO DE INGENIERIA DE SISTEMAS Y  
AUTOMATICA**

**Áreas de conocimiento:**

- INGENIERIA DE SISTEMAS Y AUTOMATICA

## **ÁREA DE CONOCIMIENTO: INGENIERIA DE SISTEMAS Y AUTOMATICA**

### **Actividades de investigación**

#### **Tesis Doctorales**

- Bio-Inspired Decision Making System for an Autonomous Social Robot. The Role of Fear  
*Autores:* CASTRO, A.  
*Director:* MALFAZ, M. A. ; SALICHS, M.  
*Año:* 2012
- Data Fusion Architecture for Intelligent Vehicles  
*Autores:* GARCIA, F.  
*Director:* ESCALERA, A.; ARMINGOL, J. M.  
*Año:* 2012
- Evolutionary-based global localization and mapping of three-dimensional environments  
*Autores:* MARTIN, F.  
*Director:* GARRIDO, L. S. ; MORENO, L. E.  
*Año:* 2012
- Human inspired humanoid robot control architecture  
*Autores:* MARTINEZ DE LA CASA, S.  
*Director:* BALAGUER, C.; JARDON, A.  
*Año:* 2012
- Sistema de navegación para robots sociales basado en señales  
*Autores:* CORRALES A.  
*Director:* SALICHS, M.  
*Año:* 2012
- Stabilizer Architecture for Humanoid Robots Collaborating With Humans  
*Autores:* PIERRO, P.  
*Director:* BALAGUER, C.; MONJE, C.A.  
*Centro donde se presentó:* ESCUELA POLITECNICA SUPERIOR  
*Año:* 2012

## **Publicaciones y actividades de difusión de resultados**

### **Publicaciones en revistas científicas nacionales**

- MUSLEH, B.; ESCALERA, A.; ARMINGOL, J. M.  
Detección de obstáculos y espacios transitables en entornos urbanos para sistemas de ayuda a la conducción basados en algoritmos de visión estéreo implementados en GPU = Obstacle detection and free spaces in urban environments for advanced driver assistance systems based on stereo vision algorithms implemented in GPU , *Revista iberoamericana de automática e informática industrial*, Vol. 9, Núm. 4, 2012, pp. 462-473, ESPAÑA.

### **Publicaciones en revistas científicas internacionales**

- ALONSO, F.; FERNÁNDEZ, J. ; MALFAZ, M. A. ; SALICHS, M.  
User Localization During Human-Robot Interaction, *Sensors*, Vol. 12, Núm. 7, 2012, pp. 9913-9935, SUIZA.
- BRUNETE, A.; HERNANDO, M.; GAMBAO, E.; TORRES, J.E.  
A behaviour-based control architecture for heterogeneous modular, multi-configurable, chained micro-robots, *Robotics and autonomous systems*, Vol. 60, Núm. 12, 2012, pp. 1607-1624, HOLANDA.
- CARRASCO, J. P. ; ESCALERA, A.; ARMINGOL, J. M.  
Recognition Stage for a Speed Supervisor Based on Road Sign Detection, *Sensors*, Vol. 12, 2012, pp. 8028-8053, SUIZA.
- GARCIA, F.; JIMENEZ, F.; NARANJO, J.; ZATO, J.; APARICIO, F.; ARMINGOL, J. M. ; ESCALERA, A.  
Environment perception based on LIDAR sensors for real road applications, *Robotica*, Vol. 30, Núm. 2, 2012, pp. 185-193, REINO UNIDO.
- JARDON, A. ; J. G. VICTORES; MARTINEZ DE LA CASA, S.; BALAGUER, C.  
Experience acquisition simulator for operating microtunneling boring machines, *Automation in Construction*, Vol. 23, Núm. 0, 2012, pp. 33-46, HOLANDA.
- JARDON, A. ; J. G. VICTORES; MARTINEZ DE LA CASA, S.; GIMENEZ, A.; BALAGUER, C.  
Personal Autonomy Rehabilitation in Home Environments by a Portable Assistive Robot, *IEEE Transactions on Systems, Man, and Cybernetics, Part C: Applications and Reviews*, Vol. 42, Núm. 4, 2012, pp. 561-570, ESTADOS UNIDOS DE AMERICA.
- JARDON, A. ; MONJE, C.A.; BALAGUER, C.  
Functional evaluation of ASIBOT: A new approach on portable robotic system for disabled people, *Applied bionics and biomechanics*, Vol. 9, Núm. 1, 2012, pp. 85-97, REINO UNIDO.
- MARTI, E.D.; MARTIN, D.; GARCIA, J. ; ESCALERA, A.; MOLINA, J. M. ; ARMINGOL, J. M.  
Context-aided Sensor Fusion for Enhanced Urban Navigation , *Sensors*, Vol. 12, Núm. 12, 2012, pp. 16802-16837, SUIZA.
- MARTIN, F.; MORENO, L. E. ; GARRIDO, L. S. ; BLANCO, M. D.  
High-accuracy global localization filter for three-dimensional environments, *Robotica*, Vol. 30, Núm. 3, 2012, pp. 363-378, REINO UNIDO.

- MARTINEZ DE LA CASA, S.; MONJE, C.A.; JARDON, A. ; PIERRO, P.; BALAGUER, C.; MUÑOZ, D.  
TEO: Full-Size Humanoid Robot Design Powered by a Fuel Cell System, *Cybernetics and Systems*, Vol. 43, Núm. 3, 2012, pp. 163-180, ESTADOS UNIDOS DE AMERICA.
- NACHIDI, M.; TADEO, F.; BENZOUIA, A.  
Controller Design for Takagi-Sugeno Systems in Continuous-Time , *International journal of innovative computing, information and control*, Vol. 9, 2012, pp. 6389-6400, JAPON.
- PELAEZ, G.A.; ARMINGOL, J. M. ; ESCALERA, A.  
Detection and classification of road signs for automatic inventory systems using computer vision, *Integrated computer-aided engineering*, Vol. 19, Núm. 3, 2012, pp. 285-298, HOLANDA.
- SALICHS, M.; MALFAZ, M. A.  
A new approach to modelling emotions and their use on a decision-making system for artificial agent, *IEEE transactions on affective computing*, Vol. 3, Núm. 1, 2012, pp. 56-68, ESTADOS UNIDOS DE AMERICA.

### **Colaboraciones en obras colectivas**

- GARCIA, F.; MUSLEH, B.; OLMEDA, D.; OTAMENDI, J.; ESCALERA, A.; ARMINGOL, J. M.  
*Laser Scanner Fusion Application for Pedestrian Detection in Road Safety Application*, en: Advances in Laser and Optics Research , NOVA SCIENCE PUBLISHERS INC, ESTADOS UNIDOS DE AMERICA, pp. 137-162, 2012.
- VINAGRE, B.M.; MONJE, C.A.  
*Fractional-Order PID*, en: PID Control in the Third Millennium: Lessons Learned and New Approaches, SPRINGER , REINO UNIDO, pp. 465-493, 2012.

### **Ponencias y Comunicaciones a congresos**

- AL KAFF, A.H.A.; ABDERRAHIM, M.  
*Hybrid Model for Human Skin based on HSV and YCrCb Color Spaces*, International IEEE Intelligent Vehicles Symposium - Workshop Computer vision in robotics, *ALCALA DE HENARES*, ESPAÑA, 2012.
- AL KAFF, A.H.A.; RODRIGUEZ, S.; BENSALAH, C.; GONZALEZ-QUIJANO, J.; ABDERRAHIM, M.  
*Human Face and Hand Detection for Human-Robot Interaction using RGB-D Kinect Sensor*, 5th International Conference on Cognitive Systems, COGSYS'2012, *Viena*, AUSTRIA, 2012.
- ALONSO, F.; FERNÁNDEZ, J. ; SALICHS, M.  
*Musical Expression in a Social Robot*, IEEE Intelligent Vehicle Symposium 2012, *ALCALA DE HENARES*, ESPAÑA, 2012.
- ARISMENDI, C.A.; GOMEZ, J.V.; GARRIDO, L. S. ; MORENO, L. E.  
*Adaptative Evolution Strategy for Robotic Manipulation*, 2012 IEEE Conference on Evolving and Adaptative Intelligent Systems (EAIS), *LEGANES*, ESPAÑA, 2012.
- BAE, B.C.; BRUNETE, A.; MARIK, U.A.; DIAMARA, E.; JERMSURAWONG, J.; MAVRIDIS, N.  
*Towards an Empathizing and Adaptive Storyteller System* , 5th Workshop on Intelligent Narrative Technologies (INT5) at 8th AAAI Conference on Artificial Intelligence in Interactive Digital Entertainment, *Palo Alto (California)*, ESTADOS UNIDOS DE AMERICA, 2012.

- BENSALAH, C.; ABDERRAHIM, M.  
*New Reduced Approach for Extended SDLS to deal with the JLA in the Inverse Kinematics for an Anthropomorphic Robotic Hand using the SVD Estimation*, 1st Robotics Lab Workshop Autumn, LEGANES, ESPAÑA, 2012.
- BENSALAH, C.; ABDERRAHIM, M. ; GONZALEZ-QUIJANO, J.  
*Selectively Damped Least Squares with Joint Limits Avoidance as Inverse Kinematics approach for Shadow Hand*, HANDLE Training Workshop, BENICASSIM/BENICASIM, ESPAÑA, 2012.
- BIMBO, J.; RODRIGUEZ, S.; LIU, H.; SONG, X.; BURRUS, N.; SENERIVATNE, L.; ABDERRAHIM, M. ; ALTHOEFER, K.  
*Object Pose Estimation and Tracking by Fusing Visual and Tactile Information*; en: 2012 IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems (MFI) Conference Proceedings, IEEE - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC, 2012.
- BONSIGNORIO, F.  
*Self-structuring of embodied multisensory information through LIE groups*, Modelling multi-sensory integration, EuCogII 3rd Meeting, ESPAÑA, 2010.
- BUENO, J.G.; GONZALEZ-FIERRO, M.; MORENO, L. E. ; BALAGUER, C.  
*Facial Gesture Recognition using Active Appearance Models based on Neural Evolution* ; en: HRI'12: Proceedings of the Seventh Annual ACM/IEEE International Conference on Human-Robot Interaction , IEEE - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC, 2012.
- CRESPO, R.; BARBER, R.; MONJE, C.A.; MALFAZ, M. A.  
*An Approach on Remote Laboratories using Matlab Web Server and Easy Java Simulations*, 6th International Technology, Education and Development Conference, VALENCIA, ESPAÑA, 2012.
- FLORES, A.; COPACI, D.S.; MARTIN, A.I.; BLANCO, M. D. ; MORENO, L. E.  
*Smooth and Accurate control of multiple Shape Memory Alloys based actuators via low cost embedded hardware* , IROS 2012 IEEE/RSJ International Conference on Intelligent Robots and Systems: ATBio: Workshop pm smart materials and alternative technologies for bio-inspired robots and systems, Vilamoura, Algarve, PORTUGAL, 2012.
- GARCIA, F.; CERRI, P.; BROGGI, A.; ESCALERA, A.; ARMINGOL, J. M.  
*Data Fusion for Overtaking Vehicle Detection Based on Radar and Optical Flow*; en: Intelligent Vehicles Symposium (IV) 2012 IEEE, IEEE - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC, , 2012.
- GARCIA, F.; ESCALERA, A.; ARMINGOL, J. M.  
*Context Aided Fusion Procedure for Road Safety Application*, : Advanced Concepts for Intelligent Vision Systems, REPUBLICA CHECA, 2012.
- GARCIA, F.; ESCALERA, A.; ARMINGOL, J. M. ; JIMENEZ, F.J.  
*Context Aided Fusion Procedure for Road Safety Application*; en: 2012 IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems (MFI): Conference Proceedings , IEEE Publishing Services, ALEMANIA, 2012.
- GARCÍA-ALEGRE , M.D.C.; MARTIN, D.; guineagarcia\_pnt; GUINEA , D.  
*Real time perception and classification of relevant objects in rural environment to reach safe autonomous piloting of a commercial tractor (paper C0991)*; en: Proceedings of the Conference on Automation Technology for Off-Road Equipment: 10-11 July of 2012, Valencia, Diazotec, 2012.

- GOMEZ, J.V.; ARISMENDI, C.A.; GARRIDO, L. S. ; MORENO, L. E.  
*On Path Planning: Adaptation to the Environment using Fast Marching*; en: 2012 IEEE Conference on Evolving and Adaptive Intelligent Systems (EAIS): Conference Proceedings, IEEE Publishing Services, , 2012.
- GONZALEZ-FIERRO, M.; HERNANDEZ, D.J.; PIERRO, P.; BALAGUER, C.  
*Dynamic Modelling of Humanoid Robots Using Spatial Algebra*, XXXIII Jornadas de Automática, VIGO, ESPAÑA, 2012.
- GONZALEZ-QUIJANO, J.; ABDERRAHIM, M. ; BENSALAH, C.; AL KAFF, A.H.A.  
*A Human-Based Genetic Algorithm Applied to the Problem of Learning in-Hand Manipulation Tasks*, IROS 2012 Workshop: Beyond Robot Grasping - Modern Approaches for Learning Dynamic Manipulation, Villamoura, PORTUGAL, 2012.
- GONZALEZ-QUIJANO, J.; ABDERRAHIM, M. ; BENSALAH, C.; RODRIGUEZ, S.; BURRUS, N.; AL KAFF, A.H.A.; VILLOSLADA, A.  
*RoMPLA Robot Motion Planning and Learning Architecture*, 5th International Conference on Cognitive Systems, COGSYS'2012, Vienna, AUSTRIA, 2012.
- GONZALEZ-QUIJANO, J.; ABDERRAHIM, M. ; FERNANDEZ, F. ; BENSALAH, C.  
*A Kinodynamic Planning-Learning Algorithm for Complex Robot Motor Control*; en: 2012 IEEE Conference on Evolving and Adaptive Intelligent Systems: Conference Proceedings, IEEE - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC. , 2012.
- GONZALEZ-QUIJANO, J.; BENSALAH, C.; ABDERRAHIM, M.  
*Mixing Sample-based Kinodynamic Planning and Model Learning in Motor Control Learning Problems*, HANDLE workshop Benicasim 2012, BENICASSIM/BENICASIM, ESPAÑA, 2012.
- JARDON, A. ; J. G. VICTORES; STOELLEN, M.F.; MARTINEZ DE LA CASA, S.; BALAGUER, C.  
*Experimental evaluation of assistive robots in virtual domestic scenarios*, International Symposium for Automation and Robotics in Construction: ISG-ISARC2012, Eindhoven, HOLANDA, 2012.
- JARDON, A. ; MARTINEZ DE LA CASA, S.; J. G. VICTORES; MARTI, M.; BALAGUER, C.  
*Extended range guidance system for microtunnelling machine*, International Symposium of Automation and Robotics in Construction, Eindhoven, HOLANDA, 2012.
- LÓPEZ, J.; GIMÉNEZ, A.; GARCÍA, D.; JARDON, A. ; BALAGUER, C.  
*Diseño y simulación de un actuador de rigidez variable*; en: Anales de Ingeniería Mecánica: Revista de la Asociación Española de Ingeniería Mecánica, ASOCIACION ESPAÑOLA DE INGENIERIA MECANICA, , 2012.
- MARTIN, A.I.; FLORES, A.; BLANCO, M. D. ; COPACI, D.S.; MORENO, L. E.  
*Lightweight Magnetorheological Based Clutch Actuator for Quick Response Times*; en: ACTUATOR 2012 Conference Proceedings, 2012.
- MONJE, C.A.  
*Presentaciones Comerciales de Tecnologías Robóticas (moderadora)* , RoboCity 2012 robots para los ciudadanos, MADRID, ESPAÑA, 2012.
- MUSLEH, B.; MARTIN, D.; ESCALERA, A.; ARMINGOL, J. M.  
*Visual Ego Motion Estimation in Urban Environments based on U-V Disparity*; en: Book of Abstracts of 2012 Intelligent Vehicles Symposium, IEEE - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC. , 2012.

- MUSLEH, B.; MARTIN, D.; ESCALERA, A.; guineagarcia\_pnt; GARCIA ALEGRE, M.C.  
*Estimation and prediction of the vehicle's motion based on visual odometry and Kalman filter*; en: Advanced Concepts for Intelligent Vision Systems: 14th International Conference, ACIVS 2012, (14), SPRINGER VERLAG GMBH, ALEMANIA, 2012.
- MUSLEH, B.; MARTIN, D.; ESCALERA, A.; guineagarcia\_pnt; GARCÍA-ALEGRE, M.D.C.  
*Estimation and Prediction of the Vehicle's Motion based on Visual Odometry and Kalman Filter*; en: Advanced Concepts for Intelligent Vision Systems: 14th International Conference, ACIVS 2012, Brno, Czech Republic, September 4-7, 2012. Proceedings, SPRINGER, 2012.
- OLMEDA, D.; ARMINGOL, J. M. ; ESCALERA, A.  
*Discrete Features for Rapid Pedestrian Detection in Infrared Images*; en: Intelligent Robots and System (IROS) 2012 IEEE/RSI International Conference on, IEEE - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC, 2012.
- OLMEDA, D.; ESCALERA, A.; ARMINGOL, J. M.  
*Contrast Invariant Features for Human Detection in Far Infrared Images*; en: book of Abstracts of 2012 Intelligent Vehicles Symposium, IEEE Publishing Services, , 2012.
- OLMEDA, D.; MUSLEH, B.; GARCIA, F.; ARMINGOL, J. M. ; ESCALERA, A.  
*Detección de peatones para sistemas de asistencia a la conducción*, XXXIII Jornadas de Automática, VIGO, ESPAÑA, 2012.
- PIERRO, P.; HERNANDEZ, D.J.; HERRERO, D.; GONZALEZ-FIERRO, M.; BALAGUER, C.  
*Perception System for Working with Humanoid Robots in Unstructured Collaborative Scenarios*, 2012 IEEE Intelligent Vehicles Symposium, IV'12 Workshop: Perception in Robotics, ALCALA DE HENARES, ESPAÑA, 2012.
- PIERRO, P.; MANSARD, N.; SOUERES, P.; MONJE, C.A.; BALAGUER, C.  
*Estimation for Humanoid Robots using sensorial Intefration and Extended Kalman Filtering*, 12 Workshop Percetion in Robotics, ALCALA DE HENARES, ESPAÑA, 2012.
- RAMEY, A.A.A.; FERNÁNDEZ, J. ; SALICHS, M.  
*A Social Robot as an Aloud Reader: Putting together Recognition and Synthesis of Voice and Gestures for HRI Experimentation*; en: HRI'12 Proceedings of the Seventh Annual ACM/IEEE International Conference on Human-Robot Interaction, IEEE - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC, 2012.
- RODRIGUEZ, F.; STOELLEN, M.F.  
*Sistema de Visión Omnidireccional para Robots Mini-humanoides*, XXXIII Jornadas de Automática, VIGO, ESPAÑA, 2012.
- RODRIGUEZ, S.  
*Visual Perception System within HANDLE EU project using ROS*, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2012) Handling ROS Tutorial : Introductory tutorial to ROS and its use for robot in-hand manipulation, Vila Moura, Algarve, PORTUGAL, 2012.
- RODRIGUEZ, S.; BURRUS, N.; MUÑOZ, J.; GONZALEZ-QUIJANO, J.; BENSALAH, C.; AL KAFF, A.H.A.; ABDERRAHIM, M.  
*3D Visual Perception System for Grasping with an Anthropomorphic Hand*, 5th International Conference on Cognitive Systems, COGSYS'2012, Vienna, AUSTRIA, 2012.
- RODRIGUEZ, S.; BURRUS, N.; ABDERRAHIM, M.  
*Vision Algorithms Integration with a Robotic System Control*, HANDLE workshop Benicassim 2012, BENICASSIM/BENICASIM, ESPAÑA, 2012.



- RODRIGUEZ, S.; BURRUS, N.; ABDERRAHIM, M.  
*A-Contrario Detection of Aerial Target Using a Time-of-Flight Camera*, Sensor Signal Processing for Defence (SSPD 2012) Conference, Londres, REINO UNIDO, 2012.
- RODRIGUEZ, S.; BURRUS, N.; MUÑOZ, J.; GONZALEZ-QUIJANO, J.; BENSALAH, C.; AL KAFF, A.H.A.; ABDERRAHIM, M.  
*3D Visual Perception System for Grasping with an Anthropomorphic Hand*; en: , 2012.
- STOELEN, M.F.; FERNANDEZ DE TEJADA, V.; JARDON, A. ; BONSIGNORIO, F.; BALAGUER, C.  
*Benchmarking Shared Control for Assistive Manipulators: From Controllability to the Speed-Accuracy Trade-Off*, 2012 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2012), Vila Moura, Algarve, PORTUGAL, 2012.
- STOELEN, M.F.; MAROCCO, D.; CANGELOSI, A.; BONSIGNORIO, F.; BALAGUER, C.  
*Hebb-like Learning for the Grounding of High-Level Symbols in Sensorimotor Trajectories* , Post-Graduate Conference on Robotics and Development of Cognition, Lausana, SUIZA, 2012.
- STOELEN, M.F.; MAROCCO, D.; CANGELOSI, A.; BONSIGNORIO, F.; BALAGUER, C.  
*Online Learning of Sensorimotor Interactions Using a Neural Network with Time-Delayed Inputs*, IEEE Conference on Development and Learning and Epigenetic Robotics, San diego, California, ESTADOS UNIDOS DE AMERICA, 2012.
- VALERO, A.; GONZALEZ, J.; ALMAGRO, M.; SALICHS, M.  
*Boosting Mechanical Design with the C++ Object Oriented Mechanics Library*; en: Proceedings of the 2012 IEEE Global Engineering Education Conference (EDUCON), IEEE - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC, ESTADOS UNIDOS DE AMERICA, 2012.
- VALERO, A.; GONZALEZ, J.; GONZALEZ, V.; SALICHS, M.  
*Printable Creativity in Plastic Valley UC3M*; en: Proceedings of the 2012 IEEE Global Engineering Education Conference (EDUCON), IEEE - THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC, ESTADOS UNIDOS DE AMERICA, 2012.

## **Actividades de formación y movilidad de personal investigador**

### **Estancias en otros centros**

- BASAM MUSLEH LANCIS  
*Título:* Estancia de 3 meses  
*Centro Externo:* Universidad de Oxford Brookes  
*País:* REINO UNIDO  
*Duración:* 09/06/2012 a 10/09/2012.
- FERNANDO MARTIN MONAR  
*Título:* Estancia en la University of Technology, Sydney, colaborando con el profesor Jaime Valls Miró, dentro del "Centre for Intelligent Mechatronic Systems".  
*Centro Externo:* University of Technology, Sydney  
*País:* AUSTRALIA  
*Duración:* 15/09/2012 a 15/12/2012.

- MARTIN FODSTAD STOELLEN  
*Título:* Estancia de investigación.  
*Centro Externo:* Center for Robotics and Neural Systems, University of Plymouth  
*País:* REINO UNIDO  
*Duración:* 23/10/2012 a 22/11/2012.
  
- MARTIN FODSTAD STOELLEN  
*Título:* Estancia de investigación  
*Centro Externo:* Center for Robotics and Neural Systems, University of Plymouth  
*País:* REINO UNIDO  
*Duración:* 26/10/2011 a 01/02/2012.