

Mario Prats

Computer Science Engineer

+34 964 38 70 48
✉ marioprats [AT] gmail.com
<http://creatures.uji.es>
twitter - @marioprats
youtube - pratsmario, IRSLab
Linkedin



SHORT BIO

Mario Prats was born on October 31, 1980 in Castellón, Spain. He is now a post-doctoral researcher at the Robotic Intelligence Lab (Jaume-I University, Spain). He holds an Engineering Degree in Computer Science (2003), M.Sc in Advanced Computer Systems (2006) and a Ph.D. in Robotics (2009), all of them by the Jaume-I University of Castellón (Spain). His PhD thesis received the EURON Georges Giralt Award 2011 to the best European PhD thesis on robotics, and was finalist of other national and international awards. His research interests are everything related to sensor-based autonomous manipulation, mainly using vision, force and touch sensors. His research has been applied to different humanoid robots and mobile manipulators during short stays in France, Germany and South Korea. He is currently working for the EU-funded project TRIDENT, focused on autonomous manipulation in underwater environments. He has published in influential journals and proceedings in robotics, and has served as reviewer and program committee member for international journals and conferences.

EDUCATION

- 1998–2004 **Computer Science Engineering**, *Jaume-I University, Castellón, Spain.*
- 2004–2006 **M.Sc. in Advanced Computer Science Systems with High Distinction**, *Department of Computer Science and Engineering, Jaume-I University, Castellón, Spain.*
Master thesis title: *Librarian Robots*
- 2004–2009 **PhD in Advanced Computer Science Systems**, *Jaume-I University, Castellón, Spain*,
Supervised by Prof. Angel P. del Pobil and Pedro J. Sanz.
Reviewed by: Philippe Martinet, Charles C. Kemp, Hermann Bruyninckx. Thesis committee: Carlos Balaguer, Antonio Morales, Danica Kragic, Philippe Martinet, Claudio Melchiorri.
Title: *Robot Physical Interaction through the combination of Vision, Tactile and Force Feedback. Applications to Assistive Robotics*
Received the **EURON Georges Giralt Award 2011** to the best European PhD thesis in robotics, **Robotdalen International Scientific Award Honorable Mention 2009**, and second prize of **CEA-GTRob award to the best PhD thesis on robotics**.
Thesis available at: <http://creatures.uji.es/~mprats/thesis/>

SCHOLARSHIPS AND AWARDS

- 2000–2001 **8-months collaboration with the Center of Education and New Technologies (CENT)**, *Jaume-I University*.
Tasks: Administration of GNU/Linux servers
- 2002–2003 **11-months collaboration with the Robotic Intelligence Lab**, *Jaume-I University*.
Project: Librarian robots. Autonomous manipulation of books in libraries.
- 2003–2004 **6-months Erasmus grant at LASMEA**, *Blaise Pascal University, Clermont-Ferrand, France*, Supervised by Prof. Philippe Martinet.
Project: combination of visual servoing and force control.
- 2003 **Jaume-I University award to the best Erasmus student expedient.**
- 2004 **4-months research grant at the Robotic Intelligence Lab**, *Jaume-I University*.
Project: Service tasks for a mobile manipulator. The UJI Service Robot.
- 2004–2008 **48-months research grant of the local government (Generalitat Valenciana)**.
PhD project at the Robotic Intelligence Lab, *Castellón, Spain*

- 2008–2009 **12-months research grant of the Jaume-I University, Castellón, Spain.**
PhD project at the Robotic Intelligence Lab
- 2009 **Robotdalen International Scientific Award Honorable Mention to the PhD thesis,**
Västerås, Sweden.
- 2010 **Second prize of CEA-GTRob award to the best PhD thesis on robotics,** Málaga,
Spain.
- 2011 **Winner of the Georges Giralt Award to the best European PhD thesis on robotics,**
April 7th, 2011, Västerås, Sweden.

PROFESSIONAL EXPERIENCE

- 2001–2003 **24-months at the Jaume-I University Computer Science Service.**
Tasks: database design and web applications for the university departments
- 2002–2010 **Scholarships and PhD at the Jaume-I University Robotic Intelligence Lab.**
Topic: Robot Physical Interaction through the combination of Vision, Tactile and Force Feedback.
<http://www.robot.uji.es>
- 2010–present **Researcher at the Jaume-I University Interactive and Robotic Systems Lab.**
Topic: research contract for the EU-funded project TRIDENT (Marine Robots and Dexterous Manipulation for Enabling Autonomous Underwater Multipurpose Intervention Missions).
<http://www.irs.uji.es/trident/>

RESEARCH STAYS

- 2003–2004 **6-months research stay at LASMEA, Blaise Pascal University, Clermont-Ferrand, France,** Supervised by Prof. Philippe Martinet.
Project: combination of visual servoing and force control. Vision-force control
- 2007 **3-months invited researcher at the Intelligent Systems Research Center (ISRC), Sungkyunkwan University, Suwon, South Korea,** Supervised by Prof. Sukhan Lee and Prof. Philippe Martinet.
Project: external vision-force control on a mobile manipulator with applications to door opening
- 2007 **5-months research stay at the IAIM, Karlsruhe University, Karlsruhe, Germany,** Supervised by Prof. Rüdiger Dillmann and Tamim Asfour.
Project: force control of a humanoid robot arm with joint and grasp redundancy
- 2009 **2-months invited researcher at the Intelligent Systems Research Center (ISRC), Sungkyunkwan University, Suwon, South Korea,** Supervised by Prof. Sukhan Lee and Prof. Angel P. del Pobil.
Project: specification of physical interaction through demonstration

PUBLICATIONS

- INTERNATIONAL JOURNALS
- M. Prats, D. Ribas, N. Palomeras, J. C. García, V. Nannen, J. J. Fernández, J. P. Beltrán, R. Campos, P. Ridao, P. J. Sanz, G. Oliver, M. Carreras, N. Gracias, R. Marín, A. Ortiz. Reconfigurable AUV for Intervention Missions: A Case Study on Underwater Object Recovery. *Journal of Intelligent Service Robotics, Sp. Issue on Marine Robotic Systems.* (Submitted, March 2011).
 - J. J. Fernández, M. Prats, P. J. Sanz, J. C. García, R. Marín, and Mike Robinson. A New Underwater Robot Arm for Shallow Water Intervention Missions. *IEEE/ASME Trans. on Mechatronics, Focused Section on Marine Mechatronic Systems.* (Submitted, April 2011)
 - M. Prats, P.J. Sanz and A.P. del Pobil. Reliable non-prehensile door opening through the combination of vision, tactile and force feedback. *Autonomous Robots*, 29(2), pp. 201-218, 2010.
 - M. Prats, P.J. Sanz and A.P. del Pobil. A Framework for Compliant Physical Interaction: the grasp meets the task. *Autonomous Robots*, 28(1), pp. 89-111, 2010.
 - M. Prats, E. Martínez, P.J. Sanz, A.P. del Pobil. The UJI Librarian Robot. *Journal of Intelligent Service Robotics*, vol. 1, num. 4, pp 321-335, Oct. 2008.

- M. Prats, P.J. Sanz, A.P del Pobil, E. Martínez, R. Marín. Towards multipurpose autonomous manipulation with the UJI service robot. *ROBOTICA*, vol. 25, pp. 245-256, Cambridge University Press, 2007.
- M. Prats, P. Martinet, A.P. del Pobil, S. Lee. Robotic Execution of Everyday Tasks by means of External Vision/Force Control. *Journal of Intelligent Service Robotics*, vol. 1, num. 3, pp. 253-266, 2008.
- NATIONAL JOURNALS M. Prats, P.J. Sanz, E. Martínez, R. Marín, A. P. del Pobil. Manipulación Autónoma Multipropósito en el Robot de Servicios Jaume-2. *Revista Iberoamericana de Automática e Informática Industrial*, vol. 5, num. 2, Abril 2008, pp. 25-37. ISSN: 1697-7912
- BOOK CHAPTERS M. Prats, P. Martinet, S. Lee, P.J. Sanz. Compliant Physical Interaction based on External Vision-Force Control and Tactile-Force Combination. *Lecture Notes in Electrical Engineering*, Vol. 35. Lee, S.; Ko, Hanseok; Hahn, Hernsoo (Eds.) 2009. ISBN: 978-3-540-89858-0
- INTERNATIONAL CONFERENCES M. Prats, P.J. Sanz and A.P del Pobil. Towards specification, planning and sensor-based control of autonomous underwater intervention. *Accepted for publication in 18th IFAC World Congress*, Milano, Italy, 2011.
- M. Prats, J.C. García, J. J. Fernández, R. Marín and P. J. Sanz. Advances in the Specification and Execution of Underwater Autonomous Manipulation Tasks. *IEEE OCEANS 2011*, Santander, Spain, June 2011.
- J.J Sorribes, M. Prats and A. Morales. Visual Robot Hand Tracking based on Articulated 3D Models for Grasping. *IEEE International Conference on Robotics and Automation*, Accepted, Anchorage, Alaska, 2010.
- M. Prats, P.J. Sanz and A.P del Pobil. Vision-Tactile-Force Integration and Robot Physical Interaction. *IEEE International Conference on Robotics and Automation*, pp. 3975-3980, Kobe, Japan, 2009.
- M. Prats, S. Wieland, T. Asfour, A.P. del Pobil and R. Dillmann. Compliant Interaction in Household Environments by the Armar-III Humanoid Robot. *IEEE-RAS International Conference on Humanoid Robots*, pp 475-480, Korea, 2008.
- M. Prats, P. Martinet, S. Lee, P. J. Sanz. Compliant Physical Interaction based on External Vision-Force Control and Tactile-Force Combination. *International Conference on Multisensor Fusion and Integration for Intelligent Systems*, Seoul (Korea), 2008.
- M. Prats, P. J. Sanz, A. P. del Pobil. A Framework for Compliant Physical Interaction based on Multisensor Information. *International Conference on Multisensor Fusion and Integration for Intelligent Systems*. Seoul (Korea), 2008.
- M. Prats, P. Martinet, A. P. del Pobil, S. Lee. Vision/Force Control in Task-Oriented Grasping and Manipulation. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'07)*, Oct 29 - Nov 2, Sheraton Hotel, San Diego, CA, USA, 2007.
- M. Prats, P. J. Sanz, A. P. del Pobil. Task Planning for Intelligent Robot Manipulation. In *Artificial Intelligence and Applications*, Innsbruck, Austria February 12-14, 2007.
- M. Prats, P. J. Sanz, A. P. del Pobil. Task-Oriented Grasping using Hand Preshapes and Task Frames. In *IEEE International Conference on Robotics and Automation (ICRA'07)*, 10-14 April, Roma, Italy, 2007.
- A. Morales, M. Prats, G. Recatalá. A Framework for using Tactile Data in Autonomous Reactive Manipulation. In *Robotics and Applications and Telematics (RA'07)*, 29-31 August, Würzburg, Germany, 2007
- Youcef Mezouar, M. Prats, P. Martinet. External Hybrid Vision/Force Control. In *International Conference on Advanced Robotics*, August 21-24, Jeju Island, South Korea, 2007.
- M. Prats, A. P. del Pobil, P. J. Sanz. A Control Architecture for Compliant Execution of Manipulation Tasks. In Proc. of *International Conference on Intelligent Robots and Systems*, Beijing, China, October 9-15. 2006.
- M. Prats, P. J. Sanz, A. P. del Pobil. Model-based Tracking and Hybrid Force/Vision Control for the UJI Librarian Robot. In Proc. of *International Conference on Intelligent Robots and Systems*, Edmonton, Canada 2005.

E. Martínez, M. Prats, A. P. del Pobil, P. J. Sanz. Robots Behave in the Real World: Looking for Books in a Library. In the *9th IASTED International Conference on Artificial Intelligence and Soft Computing*, 12-14 September, Benidorm, Spain 2005.

M. Prats, P. J. Sanz, A. P. del Pobil. Perception-Based Search and Manipulation in a Semi-Structured Environment. In Proc. of *International Conference on Advanced Robotics (ICAR05)*, Seattle, USA. pp. 749 - 754, 2005.

M. Prats, R. Ramos-Garijo, P. J. Sanz, A. P. del Pobil. Autonomous Localization and Extraction of Books in a Library. In *Intelligent Autonomous Systems*, edited by F. Groen et al., IOS Press, Amsterdam 2004.

Prats M., Ramos-Garijo R., Sanz P.J., del Pobil A.P. A Robot for Intelligent Book Handling. *Artificial Intelligence and Applications*, Vol. 2, pp. 718–723, 2004.

R. Ramos-Garijo, M. Prats, P. J. Sanz, A. P. del Pobil. Recent Progress in the UJI Librarian Robot. In *IEEE Int. Conference on Systems, Man & Cybernetics*, The Hague, The Netherlands 2004.

R. Ramos-Garijo, M. Prats, P. J. Sanz, A. P. del Pobil. An Autonomous Assistant Robot for Book Manipulation in a Library. In Proc. of *IEEE Int. Conference on Systems, Man & Cybernetics*, Washington D.C., USA. 2003.

VIDEO PROC. IN INTERNATIONAL CONFERENCES M. Prats, A. P. del Pobil, P. J. Sanz. A Control Architecture for Compliant Execution of Manipulation Tasks. Selected Video in Proc. of *International Conference on Intelligent Robots and Systems*, Beijing, China. October 9-15. 2006.

A. P. del Pobil, M. Prats, R. Ramos-Garijo, P. J. Sanz, E. Cervera. The UJI Librarian Robot: An Autonomous Service Application. Selected Video in Proc. of the *IEEE Int. Conference on Robotics and Automation*, Barcelona, Spain 2005

INTERNATIONAL WORKSHOPS A. P. del Pobil, M. Prats, P. Martinet, S. Lee, R. Dillmann. A Sensor-Based Approach for Dependable Physical Interaction. *Technical Challenges for Dependable Robots in Human Environments*. Pasadena, California, USA: 17-04-2008

M. Prats, P.J. Sanz, A.P del Pobil. A sensor-based approach for Physical Interaction based on Hand, Grasp and Task Frames. In Proc. of *Robotics: Science and Systems – Robot Manipulation Workshop: Intelligence in Human Environments*. Zurich, Switzerland, June 2008.

A. Morales, M. Prats, P. J. Sanz, A. P. del Pobil. An Experiment in the Use of Manipulation Primitives and Tactile Perception for Reactive Grasping. In Proceedings of the *Robotics: Science & Systems 2007 Manipulation Workshop - Sensing and Adapting to the Real World*, 30 June, Atlanta, Georgia, USA, 2007.

OTHER SCIENTIFIC ACTIVITIES

- 2004 **Assistant to the Summer School on Image and Robotics (SSIR)**, *Sophia Antipolis, Antibes, France*.
- 2004 **Organization committee of the European Conference on Artificial Intelligence (ECAI) 2004**, *Valencia, Spain*.
- 2004-2007 **Organization committee of the International UJI Robotics School (IURS) on “Mobile Manipulators” (2004), “Robotics and Neuroscience” (2005), “Humanoid Robots” (2006) and “Assistive Robots” (2007)**, *Benicassim, Spain*.
- 2006, 2010 **Reviewer of the IEEE Transactions on Robotics**.
- 2008 **Reviewer of the IEEE/ASME Transactions on Mechatronics**.
- 2009 **Reviewer of the Autonomous Robots journal**.
- 2010 **Organization committee of the 2010 RSS Workshop on Mobile Manipulation**, *Zaragoza, Spain*.

LANGUAGES

- Spanish **native**
- English **advanced**
- French **intermediate**

COMPUTER SKILLS

Math Packages	Mathematica, Matlab, Octave, Maple	Programming Languages	C/C++, Java, PHP, Python, Oracle PL/SQL, SQL, Shell script, Javascript, HTML
Libraries	OpenCV, VXL, ViSP, OpenGL, ODE, Coin3D, OpenSceneGraph, ROS, KDL	Graphics	Blender, inkscape, xfig, gnuplot, GIMP
Administration	Apache, Wordpress, Zope, Plone, MySQL		

OPEN SOURCE SOFTWARE

- GNU/Linux kernel module for the JR3 force sensor, used in UPC (Barcelona), LUT (Finland), TUM (Munich), Virtual Reality Lab (NASA JPL), University of Utah, etc.
- GNU/Linux library for the SpaceMaster 6DOF joystick
- In progress: Library for Robot Physical Interaction, Robotic Underwater Intervention Simulator

UPDATED

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