Pablo Gómez Esteban

Department of Mechanical Engineering, Vrije Universiteit Brussel
Building Z - Room ZW102, Pleinlaan , 2. B-1050 Brussels, Belgium
pablo.gomez.esteban@vub.ac.be
http://mech.vub.ac.be/multibody/members/pablo.htm

Research Interests

Intelligent Agents, Affective Computing, Cognitive Architectures, Domestic and Social Robots, Human-Robot Interaction

Education

2011–2014 | **PhD. in Information Systems Engineering**
Rey Juan Carlos University (Madrid, Spain)
Thesis: Cooperation and Competition in Emotional Robot Societies.
Supervisor: Dr. David Ríos Insua.
Summa cum laude (with highest distinction)

2009–2011 | **Artificial Intelligence Research Master's Degree**
Polytechnic University (Madrid, Spain)
Thesis: Development of a particle diffusion simulator based on bacterial ecosystems.
Supervisor: Dr. Alfonso Rodríguez-Patón.

2003–2009 | **Computer Science Degree**
ICAI School of Engineering, Comillas Pontifical University (Madrid, Spain) and Universitè EPF (Paris, France)
Final Project: Développement du projet de Reporting par les diffuseurs.
Supervisor: Dr. David Contreras Bárcenas and Mr. Laurent Fournier.

Professional Experience

2014 – **Vrije University of Brussels**
Post-Doc Researcher: I am coordinating and developing the incumbent workpackages within a FP7 project aimed at designing and building social robots to be used in treatments for children with autism spectrum disorders (www.dream2020.eu).

2011 – 2014 **Rey Juan Carlos University of Madrid**
Research Assistant: I studied how emotional based robotic agents make decisions within a society of human and robotic agents. We designed and implemented an Adversarial Risk Analysis model within an AiSoy1 robot allowing it to face one or several users and robotic agents. We developed and implemented an emotional model which modifies the behaviour of the AiSoy1 robot within its decision-making process, moving it from cooperation to competition, or viceversa. Results of this research have been published at several conferences.

2011 **AiSoy Robotics S.L.**
Software Engineering: Developing and testing C/C++ apps for AiSoy1 robot. I set up the SDK environment and worked with OpenCV libraries.

2010 – 2011 **Artificial Intelligence Lab (Polytechnic University of Madrid)**
Research Assistant: I developed an stochastic particle's diffusion simulator focused on bacteria ecosystems. During this time I learnt about bacterial communication, specially the Quorum Sensing mechanism. This work was part of a European project named BACTOCOM (http://www.bactocom.eu/). With the results obtained, we presented a paper at the IWINAC 2011 congress.

Teaching Experience

Master's degree thesis co-supervisor

2016 Design and implementation of an adaptive motivational mechanism for a teaching robot by David De Backer.

2015 Implementation and testing of a reactive subsystem in a social robot by Niels De Valck.

Implementation and testing of an attention subsystem in a social robot by Quentin Crabbé.

Development of an Autonomous Cognitive Architecture for an Imitation Intervention Using the Humanoid robot Nao for Autistic Children by Huu Quang Nguyen.

2014 An autonomous cognitive architecture for robot therapy by Albert de Beir.

Implementation of a Lip-Sync and Text to Speech Module in the Probo Software by Maxim Al Zein.

Development of an Autonomous Software Architecture for Social Robots by Roger Tilmans.

2012 A model for social robot planning by Alberto Redondo.

Mobility Experience

July - November 2013	I spent four months at the Agent's Group, a research group at the Centre for Intelligent Systems and their Applications within the School of Informatics at the **University of Edinburgh**, working under the supervision of **Dr. Michael Rovatsos**. We designed and implemented a negotiation environment where several decision-making models were compared using the Colored Trails Framework. We performed human-agent interaction experiments. We are writing a paper together to publish the obtained results

Reviewing & Committees

Journal Reviewing:	Frontiers in psychology, Autonomous Robots, International Journal of Social Robotics, Robotics and Autonomous Systems.
Conference Reviewing:	HRI 2016 and 2017. ACM/IEEE International Conference on Human-Robot Interaction.
	New Friends 2015. The 1st conference on social robots in therapy and education.
	ICSR 2015 and 2016. The 7th (and 8th) International Conference on Social Robotics.
	ICORR 2017. The IEEE-RAS-EMBS International Conference on Rehabilitation Robotics.
Scientific Committee:	Conferência Ibérica de Sistemas e Tecnologias de Informação (CISTI) 2015 and 2016.

Talks

Invited Talks & Seminars

August 2015	**2nd Summer School on Social Human-Robot Interaction**. Mariehamn, Finland. Nao programming I: Get familiar with Nao.
April 2014	**Robotics and MultiBody Mechanics Research Group (Vrije Universeit Brussel)** Cooperation and Competition in Emotional Robot Societies.
March 2014	**URJC TechFest 3 (Rey Juan Carlos University)** Sociedades con Robots Emocionales.
December 2013	**Statistics and Operational Research Department (Rey Juan Carlos University)** Cooperation and Competition in Emotional Robot Societies.
July 2013	**The Centre for Intelligent Systems and their Applications (Edinburgh University)** Emotional Agents under the Adversarial Risk Analysis framework.
July 2012	**Telluride Neuromorphic Cognition Engineering Workshop**. Telluride (CO), USA. Tutorial on ROS and AiSoy1.

Conferences and Workshops

2016 **AISB Convention**. Sheffield, U.K. **Talk**: A multilayer reactive system for robots interacting with children with autism.

2014 **20th Conference of the International Federation of Operational Research Societies (IFORS 2014)**. Barcelona, Spain. **Talk**: An affective model for an autonomous decision agent.

2013 **11th Conference on Practical Applications of Agents and Multi-Agent Systems (PAAMS 2013)**. Salamanca, Spain. **Talk**: Designing Autonomous Social Agents under the Adversarial Risk Analysis Framework.

9th Spain-Italy-Netherlands Meeting on Game Theory (SING9). Vigo, Spain. **Talk**: Designing Societies of Robots: From Competition to Cooperation.

National Congress of Statistics and Operations Research (SEIO 2013). Castellón, Spain. **Talk**: Modelling Competition and Cooperation in Social Autonomous Agents

The 3rd International Workshop on Scalable Decision Making: Uncertainty, Imperfection, Deliberation (SCALE 2013). Prague, Czech Republic. **Talk**: Designing Societies of Robots.

2012 **Cognitive Information Processing International Workshop (CIP 2012)**. Baiona, Spain. **Talk**: An adversarial risk analysis model for a decision agent facing multiple users.

National Congress of Statistics and Operations Research (SEIO 2012). Madrid, Spain. **Talk**: Modelling and Implementing an Emotional Based Decision Agent.

2011 **Neural Information Processing Systems International Conferences and Workshops (NIPS 2011)**. Granada, Spain. **Talk**: An Adversarial Risk Analysis Model for an Autonomous Imperfect Decision Agent. **Demo**: Aisoy1, a robot that perceives, feels and makes decisions.

Poster Sessions

2013 **15th European Agent Systems Summer School (EASSS 2013)** Designing Societies of Emotional Agents under the Adversarial Risk Analysis framework.

2012 **SEMATICA 2012, Doctoral Seminars**. Cooperation and competition within emotional robots.

Awards and Scholarships

2015 **Best Paper Award**: For the paper *Survey investigating ethical issues concerning Robot Enhanced Therapy for children with autism* at the 1st International Conference on Social Robots in Therapy and Education at Almere, The Netherlands, (22nd-23rd October).

2013 **Scientific Excelence Award**: For the paper *Designing Autonomous Social Agents under the Adversarial Risk Analysis Framework* at the 11th Conference on Practical Applications of Agents and Multi-Agent Systems at Salamanca, (22nd-24th May).

EASSS 2013 Attendance Grant: Selected to attend the 15th European Agent Systems Summer School at London, (1st-5th July).

Mobility Grant: Granted by the Rey Juan Carlos University for 4 months to attend Agent's Group at University of Edinburgh, United Kingdom.

2008 - 2009 **Erasmus Scholarship**: To develop my degree's final project at Universitè EPF (Paris, France), for 10 months.

Publications

Theses

2014 Pablo Gómez Esteban. *Cooperation and Competition in Emotional Robot Societies.* PhD thesis, Rey Juan Carlos University (Madrid, Spain), 2014.

2011 Pablo Gómez Esteban. Development of a particle diffusion simulator based on bacterial ecosystems. Master's thesis, Polytechnic University (Madrid, Spain), 2011.

Book Chapters

2015 H.L. Cao, C. Pop, R. Simut, R. Furnemnt, A. De Beir, G. Van de Perre, P. G. Esteban, D. Lefeber, and B. Vanderborght. *Probolino: A Portable Low-Cost Social Device for Home-Based Autism Therapy*, volume 9388 of *Lecture Notes in Computer Science*, pages 93–102. Springer International Publishing, 2015.

2014 P.G. Esteban and D. Ríos Insua. *Designing Societies of Robots.*, pages 33–53. Chapter in Guy, Tatiana V.; Karny, Miroslav (Springer Eds), Scalable Decision Making: Uncertainty, Imperfection, Deliberation., 2015.

2013 J.G. Rázuri, P.G. Esteban, and D. Ríos Insua. *An Adversarial Risk Analysis Model for an Autonomous Imperfect Decision Agent.*, pages 163–187. Chapter in Guy, Tatiana V.; Karny, Miroslav; Wolpert, David (Springer Eds), Decision Making and Imperfection, 2013.

Refereed Journals

2017 Hoang-Long Cao, Pablo G. Esteban, Albert De Beir, Ramona Simut, Greet Van de Perre, Dirk Lefeber, and Bram Vanderborght. A collaborative homeostatic-based behavior controller for social robots in human-robot interaction experiments. *International Journal of Social Robotics*, 2017. To be published.

G. Van De Perre, H-L. Cao, A. De Beir, P. G. Esteban, D. Lefeber, and B Vanderborght. Generic method for generating blended gestures and affective functional behaviors for social robots. *Autonomous Robots*, 2017. To be published.

Pablo G. Esteban, Paul Baxter, Tony Belpaeme, Erik Billing, Haibin Cai, Hoang-Long Cao, Mark Coeckelbergh, Cristina Costescu, Daniel David, Albert De Beir, Yinfeng Fang, Zhaojie Ju, James Kennedy, Honghai Liu, Alexandre Mazel, Amit Pandey, Kathleen Richardson, Emmanuel Senft, Serge Thill, Greet Van de Perre, Bram Vanderborght, David Vernon, Hui Yu, and Tom Ziemke. How to build a supervised autonomous system for robot-enhanced therapy for children with autism spectrum disorder. *Paladyn. Journal of Behavioral Robotics*, 2017. To be published.

G. Van De Perre, H-L. Cao, A. De Beir, P. G. Esteban, D. Lefeber, and B Vanderborght. Generating gestures for different robot morphologies through one generic gesture system: validation on physical robots. *International Journal of Robotics Research*, 2017. Submitted.

2016 Albert De Beir, Hoang-Long Cao, Pablo G. Esteban, Greet Van de Perre, Dirk Lefeber, and Bram Vanderborght. Enhancing emotional facial expressiveness on nao. *International Journal of Social Robotics*, 8:513–521, 2016.

Greet Van de Perre, Albert De Beir, Hoang-Long Cao, Pablo G. Esteban, Dirk Lefeber, and Bram Vanderborght. Reaching and pointing gestures calculated by a generic gesture system for social robots. *Robotics and Autonomous Systems*, 83:32–43, 2016.

2014 P.G. Esteban and D. Ríos Insua. Supporting an autonomous social agent within a competitive environment. *Cybernetics and Systems International Journal*, 45(3):241–253, 2014.

2013 D. Ríos Insua, D. García, and P.G. Esteban. Sociedades de robots emocionales. *Revista de la Real Academia de las Ciencas Exáctas, Físicas y Naturales*, 105(2):259–266, 2012.

D. Ríos Insua, D. García, P.G. Esteban, and A. Redondo. Máquinas que perciben, sienten y deciden. *Revista de la Real Academia de las Ciencas Exáctas, Físicas y Naturales*, 105(1):99–106, 2011.

2011 P.G. Esteban and A. Rodríguez-Patón. Simulating a rock-scissors-paper bacterial game with a discrete cellular automaton. *New Challenges on Bioinspired Applications*, 6687:363–370, 2011.

Proceedings

2016 Pablo G. Esteban, Hoang-Long Cao, Albert De Beir, Greet Van de Perre, Dirk Lefeber, and Bram Vanderborght. A multilayer reactive system for robots interacting with children with autism. *arXiv preprint arXiv:1606.03875*, 2016.

2015 H.L. Cao, P. G. Esteban, A. De Beir, R. Simut, G. Van de Perre, D. Lefeber, and B. Vanderborght. Robee: A homeostatic-based social behavior controller for robots in human-robot interaction experiments. In *IEEE International Conference on Robotics and Biomimetics (ROBIO)*, pages 516–521, 2014.

H.L. Cao, P. G. Esteban, A. De Beir, R. Simut, G. Van de Perre, D. Lefeber, and B. Vanderborght. Toward a platform-independent social behavior architecture for multiple therapeutic scenarios. In *Proceedings of the 1st International Conference on Social Robots in Therapy and Education*, 2015.

M. Coeckelbergh, C. Pop, R. Simut, A. Peca, P. G. Esteban, A. De Beir, H.L. Cao, D. D. David, and B. Vanderborght. Survey investigating ethical issues concerning robot enhanced therapy for children with autism. In *Proceedings of the 1st International Conference on Social Robots in Therapy and Education*, 2015.

A. De Beir, H.L. Cao, P. Gomez Esteban, G. Van De Perre, and B. Vanderborght. Enhancing nao expression of emotions using pluggable eyebrows. In *Proceedings of the 1st International Conference on Social Robots in Therapy and Education*, 2015.

R. Tilmans, P. Gomez Esteban, H.L. Cao, and B. Vanderborght. Social and autonomous confabulation architecture. In *Proceedings of the 1st International Conference on Social Robots in Therapy and Education*, 2015.

Hoang-Long Cao, Cristina Pop, Ramona Simut, Raphaël Furnemónt, Albert De Beir, Greet Van de Perre, Pablo G. Esteban, Dirk Lefeber, and Bram Vanderborght. Probolino: A portable low-cost social device for home-based autism therapy. In *International Conference on Social Robotics*, pages 93–102. Springer, 2015.

2013 P.G. Esteban and D. Ríos Insua. Designing autonomous social agents under the adversarial risk analysis framework. In *Highlights in Practical Applications of Agent and Multi-Agent (CCIS series of Springer)*, volume 365, pages 292–303. Juan M. Corchado et al.(Eds), 2014.

2012 P.G. Esteban, J.G. Rázuri, and D.R. Insua. An adversarial risk analysis model for a decision agent facing multiple users. In *Proceedings in 3rd International Workshop on Cognitive Information Processing (CIP)*, pages 1–6, 2012.

2011 J.G. Rázuri, P.G. Esteban, and D. Ríos Insua. An adversarial risk analysis model for an autonomous imperfect decision agent. In *Proceedings in NIPS. Workshop on Decision Making with Multiple Imperfect Decision Makers*. Springer, 2011.

Personal

- Born 13th May 1985 in Madrid, Spain; citizenship: Spanish; marital status: single.
- Languages: Spanish (native), English (advanced), French (basics).

References

Available upon request