Bartomeu Pou | Researcher in AI, Robotics

Algaida, Illes Balears – Spain
+34 622 055 672 • tom_93_mot@hotmail.com
scholar.google.com/citations?user=dYJC0tQAAAAJ • 0000-0001-8634-2316

Research Summary

Doctor in Artificial Intelligence (UPC) and Astronomy & Astrophysics (PSL – Observatoire de Paris), with international experience at Subaru Telescope (Hawaii, USA), the Australian National University (Canberra, Australia) and the Barcelona Supercomputing Center (Spain). My research combines reinforcement learning, computer vision, adaptive optics, and social robotics, focused on designing autonomous systems capable of operating in real time under strong computational constraints.
I have published in high-impact venues including ICLR, Optics Express, and multiple SPIE conferences. My work has been integrated into real platforms such as SCExAO (Subaru Telescope), CACAO, and COSMIC.

Technical Skills

ML & AI: PyTorch, TensorRT, Reinforcement Learning, Deep Learning, Vision-Language Models (VLM)
Others: ROS2, Real-Time Systems, Social Robotics, Adaptive Optic
Programming: Python, C++, Bash

Research Interests

Reinforcement Learning · Social Robotics · Computer Vision · Vision-Language Models · Real-Time Control · Adaptive Optics · Human-Robot Interaction

Current Positions

EADA Business School — **Barcelona, Spain**
Associate Professor, Part-time — *Jan 2026–present*
Teaching robotics and Internet of Things.

Instituto de Investigación en Inteligencia Artificial (IIIA-CSIC) — **Bellaterra, Spain**
Research Scientist, Full-time — *Apr 2025–present*
Applied research in social robotics, reinforcement learning, and advanced AI techniques.

Previous Experience

Barcelona Supercomputing Center (BSC-CNS) — **Barcelona, Spain**
First Stage Researcher (BSC-R1), 5 years — *Jan 2020 – Mar 2025*
Research on AI for real-time adaptive optics control. Integration of deep learning into CACAO and COSMIC frameworks.

Accenture — **Barcelona, Spain**
Data Scientist, 3 months — *Oct 2019 – Jan 2020*

Accenture — **Barcelona, Spain**
Data Science Intern, 9 months — *Sep 2018 – Jun 2019*

Accenture — **Barcelona, Spain**
Data Science Intern, 2 months — *Jul 2018 – Sep 2018*

Education

PSL – Observatoire de Paris — **Paris, France**
Ph.D. in Astronomy & Astrophysics — *2025*

Universitat Politècnica de Catalunya (UPC) — **Barcelona, Spain**
Ph.D. in Artificial Intelligence — *2025*

Universitat Politècnica de Catalunya (UPC) — **Barcelona, Spain**
M.Sc. in Artificial Intelligence — *2019*

Universidad de las Islas Baleares (UIB) — **Palma, Spain**
B.Sc. in Physics — *2017*

Languages

Spanish: Native

Catalan: Native

English: C1 (CEFR)

Research Projects

RISING STARS – RISE International Network for Real-Time SystemsBarcelona Supercomputing Center
Researcher, EU Horizon 2020, Marie Skłodowska-Curie RISE, €634,800 — *Feb 2020 – Nov 2025*
PI: Damien Gratadour.

EMOROBCARE — **IIIA-CSIC**
Researcher, Ministerio para la Transformación Digital y de la Función Pública (SEDIA) — *Jun 2024 – present*
PIs: David Rios Insua, Juan Antonio Rodriguez Aguilar.

Patents

2024: **Controlling access to de-identified data sets based on a risk of re-identification.**
G. Besanson, A. Amorosi, R. Gunnerud, B. Pou Mulet, J. Gordillo Solana, F. H. Gjendem, G. Prestegård, R. Sánchez Fernández.
Accenture Global Solutions Ltd. US17/110,193. Granted: 19/11/2024.

Publications

Journal Articles

[J1] B. Pou, J. Smith, E. Quinones, M. Martin, D. Gratadour. *Integrating supervised and reinforcement learning for predictive control with an unmodulated pyramid wavefront sensor for adaptive optics.* **Optics Express** 32(21), 37011–37035, 2024. DOI: 10.1364/OE.530254. **WOS JCR IF: 3.3**

[J2] B. Pou, F. Ferreira, E. Quinones, M. Martin, D. Gratadour. *Adaptive optics control with multi-agent model-free reinforcement learning.* **Optics Express** 30(2), 2991–3015, 2022. DOI: 10.1364/OE.444099. **WOS JCR IF: 3.8**

Conference Proceedings

[C1] B. Pou, R. Ros. *Real-Time Vision for Socially Aware Robots: Gesture, Pointing, and Visual Engagement Estimation.* Companion Proceedings of the 21st ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2026. pp. 860–864.

[C2] S. Cooper, B. Pou, A. Mayoral-Macau, A. Lobo-Santos, M. Martín, R. Ros. *EMY: Supporting Autism Therapy with a Socially Assistive Robot.* Companion Proceedings of the 21st ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2026. pp. 1158–1160.

[C3] S. Cooper, B. Pou, A. Mayoral Macau, A. Redondo, D. Rios, R. Ros. *EMOROBCARE: A Low-Cost Social Robot for Supporting Children with Autism in Therapeutic Settings.* International Conference on Social

Robotics (ICSR), Springer, 2026. DOI: 10.1007/978-981-95-2379-5_53.

[C4] M. Gallici, M. Fellows, B. Ellis, B. Pou, I. Masmitja, J. N. Foerster, M. Martin. *Simplifying Deep Temporal Difference Learning.* **ICLR 2025** (Core ranking A*).

[C5] B. Pou, F. Ferreira, E. Quinones, D. Gratadour, M. Martin. *Integrating deep neural networks with COSMIC for real-time control.* SPIE Astronomical Telescopes + Instrumentation 2024, Yokohama. DOI: 10.1117/12.3019710.

[C6] B. Pou, J. Smith, E. Quinones, M. Martin, D. Gratadour. *Model-free reinforcement learning with a non-linear reconstructor for closed-loop adaptive optics control with a pyramid wavefront sensor.* SPIE Adaptive Optics Systems VIII, 2022. DOI: 10.1117/12.2627849.

[C7] F. Ferreira *et al.* (incl. B. Pou). *Future-proof seamless real-time computing for AO with COSMIC.* SPIE Adaptive Optics Systems IX, 2024. DOI: 10.1117/12.3020352.

[C8] B. Pou, E. Quinones, D. Gratadour, M. Martin. *Denoising wavefront sensor images with deep neural networks.* SPIE Adaptive Optics Systems VII, 2020. DOI: 10.1117/12.2576242.

International Research Stays

Subaru Telescope, NAOJ **Hilo, Hawaii, USA**
Research Stay (57 days) *Jan – Mar 2024*
Development of CACAO/COSMIC extensions to integrate neural networks for real-time adaptive optics. Marie Skłodowska-Curie RISE (H2020).

Subaru Telescope, NAOJ **Hilo, Hawaii, USA**
Research Stay (32 days) *May – Jun 2023*
Validation of AI methods for real-time AO control on SCExAO. Marie Skłodowska-Curie RISE (H2020).

Australian National University (ANU), School of Computing **Canberra, Australia**
Research Stay (1 month) *Apr 2023*
Collaboration with Dr Charles Gretton on AI-based control for large telescope AO systems. Marie Skłodowska-Curie RISE (H2020).

Subaru Telescope, NAOJ **Hilo, Hawaii, USA**
Research Stay (2.5 months) *Jan – Mar 2023*
Implementation of AI methods for real-time AO on SCExAO. Marie Skłodowska-Curie RISE (H2020).

Teaching

Suport de terapies per autisme amb robòtica social i IA **Universitat de Barcelona**
Seminar (2h, in Catalan) *Dec 2025*
Seminar for educators on social robotics for autism support. Part of the course *Entorns, Processos i Recursos Tecnològics d'Aprenentatge* (4th year Pedagogy).

Preguntes generals sobre intel·ligència artificial **Universitat de Barcelona**
Seminar (2h, in Catalan) *Nov 2025*
Introduction to AI fundamentals for educators. Part of the course *Ensenyament i Aprenentatge a la Societat Digital.*

Grants & Fellowships

Universitat Politècnica de Catalunya
Erasmus+ KA131 (Predoctoral, International Mobility), 8 months *Jan – Sep 2022*
Funded research stay at Observatoire de Paris – PSL.