Daniel Sotelo Aguirre

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Education

Universidad Politécnica de Madrid Madrid, Spain
M.Sc. in Automation and Robotics *Sep 2022 – Sep 2024*

- **GPA: 9.41/10.0**, 1st out of 40 students, Honors in 14/23 courses
- **Relevant coursework:** Nonlinear Systems, Optimal and Adaptive Control, Artifical Intelligence, Advanced Programming, Computer Vision, Human-Machine Interaction
- **Thesis:** Development and Integration of a NMPC-Controlled Legged-Manipulator Platform for Search and Rescue Operations

M.Sc. in Industrial Engineering *Sep 2022 – Sep 2024*

- **GPA: 9.33/10.0**, 4th out of 282 students, Honors in 20/34 courses
- **Relevant coursework:** Communications, Electronic Instrumentation, Applied Robotics, Control Systems and Automation, Electronic Systems Design
- **Thesis:** Design, Construction and Programming of a Social Robot for Personal Assistance

Universidad Pública de Navarra Pamplona, Spain
B.Sc. in Industrial Engineering *Sep 2018 – Jun 2022*

- **GPA: 9.28/10.0**, **1st out of 119 students (Valedictorian)**, Honors in 24/45 courses
- **Erasmus+ Fellowship:** Academic exchange at UCLouvain (Belgium) for 6 months
- **Relevant coursework:** Statistics, Computer Science, Control Systems, Multibody System Dynamics
- **Thesis:** Design, Simulation, Construction and Characterization of a Vibrant Magnetic Structure for its Use in Magnetostrictive Energy Harvesters

Research Experience

Intelligent Control Group Lab, Universidad Politécnica de Madrid Madrid, Spain
Graduate Research Assistant with Dr. Daniel Galán *Feb 2024 – Sep 2024, Part-time*

- Designed and fabricated a novel 3D-printed social robot optimized for cognitive assistance; integrated commercial components to balance functionality and affordability.
- Developed low-level C++ firmware and ROS 2 packages for URDF-based robot description, real-time control, and dynamic simulation in Gazebo.

RobCib Lab, Universidad Politécnica de Madrid Madrid, Spain
Graduate Research Assistant with Dr. Antonio Barrientos *Feb 2024 – Jul 2024, Part-time*

- Developed and deployed a Whole-Body Nonlinear Model Predictive Control system on a Unitree AlienGo quadruped with a Z1 arm for autonomous loco-manipulation in unstructured search and rescue environments.
- Integrated RGB-D camera-based computer vision pipeline and door-opening planning strategies in ROS; validated performance through Gazebo simulations and real-world deployment in dynamic SAR scenarios.

Miura Lab, Tokyo Institute of Technology Tokyo, Japan
Graduate Research Assistant with Dr. Satoshi Miura *Jul 2023 – Aug 2023, Full-time*

- Developed a real-time C++ inference pipeline for laparoscopic surgery using YOLACT++ and ONNX Runtime to segment surgical forceps and enable AR support, replacing a slower Python implementation.

Magnetic Materials Lab, Universidad Pública de Navarra Pamplona, Spain
Undergraduate Research Assistant with Dr. Cristina Gómez-Polo *Sep 2021 – Dec 2021, Part-time*

- Designed, simulated, and built a magnetostrictive structure for low-frequency energy harvesting; validated performance against MATLAB FEM results to support industrial use as a piezoelectric alternative.

Industry Experience

Technology Innovation Institute Abu Dhabi, UAE

Humanoid Robotics Software Engineer for Manipulation *Jan 2025 – Present, Full-time*

- Designed, developed, and deployed a software stack for a fully autonomous bi-manual robotic packing station operating in cluttered environments.
- Developed and evaluated advanced manipulation strategies for humanoid robots to autonomously pick and place objects from shelves, integrating coordinated motion planning, object instance segmentation, and grasp selection.
- Explored both classical planning pipelines with VLM-based perception and modern learning-based approaches.

Honors and Awards

"La Caixa" Foundation Fellowship *2025*
Funds 2 years of postgraduate studies (∼$180,000). Acceptance rate of ∼8% [Link]

XXI Technology Innovation Award – RBS Foundation *2025*
Award for the best engineering Master's Thesis in Madrid ($3,500) [Link]

Extraordinary End-of-Masters Award *2024*
Recognized as the top 1 among 40 students in the M.Sc. in Robotics program

First Prize in Social Robot Design Competition *2023*
Award for the best mechanical design of a fully 3D-printed assistive robot

Research Stay Scholarship at Tokyo Institute of Technology *2023*
Selected as 1 of 3 recipients among ∼5,000 engineering students [Link]

Extraordinary End-of-Degree Award (2021-2022) *2022*
Recognized as the top 1 among 119 students in the B.Sc. in Industrial Engineering program

Best Navarre University's Entrance Exam *2018*
Recognized as the student with the highest entrance exam mark among ∼1,800 students [Link]

Bronze Medal in XXIX National Spain Physics Olympiad [Link] *2018*

Publications

[1] G. Franzese, **D. Sotelo**, M.O. Elnour, P. Kopanev, A. Rehman, M. Asokan, D. Caporale and P. Ardón, "Generalization of Manipulation Skills using Keypoint Priors," presented at the *CoRL 2025 Workshop on Generalizable Priors for Robot Manipulation*, Seoul, Korea, 2025. [Paper].

[2] **D. Sotelo**, J. Laserna, D. Galán, and F. Matía, "A New Emotional Social Robotic Platform," in *Proceedings of the 7th Iberian Robotics Conference (ROBOT)*, Madrid, Spain, 2024, pp. 1-6 [Paper].

[3] **D. Sotelo**, J.J. Beato-López, E. Garayo, and C. Gómez-Polo, "Design, Simulation, Construction and Characterization of a Vibrant Magnetic Structure for its Use in Magnetostrictive Energy Harvesters," in *Proceedings of the 14th Multidisciplinary International Student Workshop (MISW)*, Tokyo, Japan, 2023 [Extended Abstract].

Skills

Languages: English (Fluent), Spanish (Native), French (Intermediate), German (Beginner), Italian (Beginner)
Programming: C++, Python, MATLAB, LaTeX
Frameworks: ROS/ROS2, Gazebo, MuJoCo, Genesis, OCS2, MoveIt, Isaac Sim
Developer Tools: Git, Docker, Linux/Unix
CAD & Design Tools: AutoCAD, SolidWorks, Autodesk Inventor, Fusion 360
Libraries: PyTorch, NumPy, SciPy, scikit-learn, pandas, Jupyter, Matplotlib