Carlos **Cardoso**

Embedded & Robotics Software Engineer · Electrical Engineer

N15 1D, Av. Duque D'Avila, 1000-138, Lisboa, Portugal

(+351) 934 009 080 | carlos.cardoso@tecnico.ulisboa.pt | carlos-cardoso.github.io | carlos-cardoso | cesfcardoso

"Progress is not achieved by luck or accident, but by working on yourself daily."

Education

Tecnico Lisboa(Instituto Superior Técnico) *Lisboa, Portugal*

M.Sc. in Electrical and Computer Engineering *2016*

- Dissertation title: *Robot Skills: From Imitation to Exploration Learning*: (Dynamic Movement Primitives and Reinforcement Learning for a Ping Pong playing Robot).
- **Primary Specialization: Systems, Decision and Control** - Relevant Coursework: Artificial Intelligence and Decision Systems, Machine Learning, Optimization and Algorithms, Modeling Identification and Digital Control, Robotics, Autonomous Systems
- **Secondary Specialization: Computers** - Relevant Coursework: Object Oriented Programming, Parallel and Distributed Computing, Hardware-Software Co-Project

Tecnico Lisboa(Instituto Superior Técnico) *Lisboa, Portugal*

B.Sc. in Electrical and Computer Engineering *2013*

Skills

Machine-learning	Gaussian Processes, Deep Learning, Kalman Filters, Motion Primitives
Robotics-software	OpenRAVE, ROS, YARP, Gazebo, Pybullet, OpenCV
Robotics-hardware	iCub, Vizzy, Kinova, CoBOT, Biorob
Embedded-development	ARM, I2C, Serial, One Wire
Embedded-peripherals	iButton, Fingerprint, EEPROMs, RTC, GPS, NFC, LCD, ePaper, motors, accelerometers, light sensors
Programming	C++, Python, Julia, Java, Rust, LaTeX, Linux, git, bash
Languages	Portuguese, English

Experience

VisLab ISR/Instituto Superior Tecnico *Lisboa, Portugal*

PhD Candidate *Oct. 2016 - Current*

- Researched physical Human-Robot interaction with tactile sensing for object handover.
- Worked with various simulation environments (gazebo, pybullet, icubsim) and real robotic platforms (biorob, Vizzy, iCub, Kinova).
- Supervised BsC and MsC students in research projects (CoLabs).

Courses:

- Convex Optimization (19/20)
- Deep Structured Learning (17/20)
- Statistical Learning (17/20)
- Outreach and Teaching Skills (17/20

Instituto Superior Tecnico *Lisboa, Portugal*

Teaching Assistant *Oct. 2017 - Feb 2018*

- Masters level course on Real Time Distributed Control Systems (SCDTR).
- Created evaluation sheet generator (in javascript), that automatically fetches student information from the university's database
- Helped students with different backgrounds (Electrical Eng. and Aerospace Eng.)
- Helped students develop a system for controlling lights according to distributed luminance sensor readings
- Evaluated the students final projects

Feerica S.A. *Mafra, Portugal*

Embedded Software Engineer *Jan. 2016 - Aug. 2016*

- Developed the firmware for IOT systems, particularly Cash-in-Transit (CIT) systems with ink protection.
- Integrated various sensors (*light, temperature, impact, accelerometers, integrity*)
- Worked with I2C and Serial peripherals including (*iButton, fingerprint readers, EEPROMs, RTC, GPS, NFC, LCD, ePaper*) and GSM communications (*3G data and SMS)*
- Used low level C++ code, running directly in a ARM microprocessors and Python for automating build systems and system configurations
- Proposed and implemented creative software solutions such as: Behavior Trees for graphical customization of business logic; Fast Fourier Transforms of accelerometer signal to detect Siren malfunctions in the field; Step-counter using the accelerometer signal for classifying CIT transport mode (walking/stationary/vehicle)
- I got to work in a high responsibility position where I had to adapt to the customers changing requirements and deadlines
- The systems that I have developed are currently operating in over 10 countries.

VisLab ISR/Instituto Superior Tecnico *Lisboa, Portugal*

Research Assistant *Dec. 2014 - Dec. 2015*

- Research assistant for the European project Poeticon++
- Investigated learning trajectories by demonstration for manipulation tasks in a humanoid robot (iCub) and a serial manipulator (Biorob).

Extracurricular Activity

Veni Vidi Vici Robotics Summer School 2015 *Sestri Levante, Italy*

Student *2015*

- Robotics Summer School focusing on software engineering for humanoid robots, particularly for the iCub and COMAN robots.

Lucia Robotiscs Winter School 2016 *Orebro, Sweden*

Student *2016*

- The 3rd Orebro Winter School on AI and Robotics.

Orquestra de Foles/APEDGF *Lisboa, Portugal*

Member *2019*

- Played traditional Portuguese/Galician Bagpipes.

- See also my side projects at carlos-cardoso.github.io/projects

Writing and Presentations

IEEE-RAS ICRA 2015 *Seattle, USA.*

First Author *2015*

- C. Cardoso, L. Jamone and A. Bernardino, A novel approach to dynamic movement imitation based on quadratic programming.

IEEE-RAS ICARSC 2017 *Coimbra, Portugal.*

First Author *2017*

- C. Cardoso and A. Bernardino, Adaptive Non-Maximal Suppression Filtering for Online Exploration Learning with Cost-Regularized Kernel Regression.

Workshop at RO-MAN 2017 *Lisboa, Portugal.*

Co-Author *2017*

- Avelino, Joao, Paulino, Tiago, Cardoso, Carlos, Nunes, Ricardo, Moreno, Plinio and Bernardino, Alexandre. ”Human-aware natural handshaking using tactile sensors for Vizzy, a social robot.”

Paladyn Journal of Behavioral Robotics 2018

Co-Author *2018*

- Avelino, João, Paulino, Tiago, Cardoso, Carlos, Nunes, Ricardo, Moreno, Plinio and Bernardino, Alexandre. ”Towards natural handshakes for social robots: human-aware hand grasps using tactile sensors.”

IEEE ICDL-EpiRob 2019 *Oslo, Norway*

Co-First Author *2019*

- A. Dehban*, C. Cardoso*, P. Vicente, A. Bernardino and J. Santos-Victor, ”Robotic Interactive Physics Parameters Estimator (RIPPE),” (* equal contribution)

EgoVIP workshop at IROS 2021 *Prague, Czech Republic*

First Author *2021*

- C. Cardoso*, A. Bernardino,”Bayesian Interaction Primitives for Robot to Human Handover with Giver-Egocentric Observations”