

Domingo Esteban

PHD STUDENT · ROBOTICS RESEARCHER

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Summary

PhD student in Bioengineering and Robotics; with an M.Sc. in Robotics and Automation, a B.Sc. in Industrial Engineering and a B.Sc. in Economics and Business.

Carrying out the doctoral research activities in the Department of Advanced Robotics at the Italian Institute of Technology (IIT). My research is focused on (deep) reinforcement learning and optimization for generation and control of whole-body skills in humanoid robots.

Research experience both in academia and industry in robot control, robot simulation and machine learning.

Research Interests

Robot Reinforcement Learning	Model-free and model-based algorithms that scale to robotics problems (high-dimensional, continuous states and actions, hierarchical and multi-task problems)
Optimal Control	Control with learned models, control with inaccurate models, Stochastic Optimal Control, Non-linear MPC
Humanoids	Whole-body motions with various tasks, multi-contact motion
Imitation Learning	Inverse reinforcement learning, shared human-robot representations

Education

Istituto Italiano di Tecnologia (IIT) – Università degli Studi di Genova

PHD IN BIOENGINEERING AND ROBOTICS – CURRICULUM: ADVANCED AND HUMANOID ROBOTICS

Genoa, Italy

Oct. 2015 - Exp. Feb. 2019

Universidad Carlos III de Madrid

M.Sc. IN ROBOTICS AND AUTOMATION

Madrid, Spain

Sept. 2012 - July 2014

Universidad Nacional de San Agustín de Arequipa

B.Sc. IN INDUSTRIAL ENGINEERING

Arequipa, Peru

Apr. 2004 - Apr. 2009

Universidad Católica San Pablo

B.Sc. IN ECONOMICS AND BUSINESS

Arequipa, Peru

Mar. 2006 - Dec. 2010

Publications

2018	Esteban, D. ; Rozo, L.; Caldwell, D. “ <i>Learning Deep Robot Controllers by Exploiting Successful and Failed Executions</i> ”, IEEE-RAS International Conference on Humanoid Robots (Humanoids) – <i>(Accepted)</i>
2017	Delhaisse, B.*; Esteban, D.* ; Rozo, L.; Caldwell, D. “ <i>Transfer Learning of Shared Latent Spaces between Robots with Similar Kinematic Structure</i> ”, IEEE International Joint Conference on Neural Networks (IJCNN) – (* Equal contribution)
2014	Martínez, S.; Esteban, D. ; Jardón-Huete, A.; Balaguer, C. “ <i>Anticipative Humanoid Postural Control System for Locomotive Tasks</i> ”, IEEE-RAS International Conference on Humanoid Robots (Humanoids)

Skills

Machine Learning SW	TensorFlow, PyTorch, OpenAI-Gym, scikit-learn, GPy
Robotics SW	ROS, YARP, Gazebo, Mujoco, PyBullet, RobotStudio, OpenCV
Programming	Python, C, C++, MATLAB/Octave, Shell scripting, HTML/CSS
Languages	English, Spanish, Italian, French

Experience

Department of Advanced Robotics (ADVR) – Istituto Italiano di Tecnologia (IIT)

Genoa, Italy

AFFILIATED RESEARCHER

Nov. 2015 - PRESENT

- Member of the Learning and Interaction group.
- Research focused on robot learning in humanoid robots:
 - (Deep) reinforcement learning for continuous control tasks: Guided Policy Search (GPS), Deep Deterministic Policy Gradients (DDPG), Normalized Advantage Functions (NAF), Maximum Entropy Policies/Soft-RL, REPS, PILCO, PI2
 - Exploiting failed executions to improve efficiency and safe-exploration in Reinforcement Learning of robotics tasks.
 - Hierarchical and multi-task reinforcement learning in robotics.
 - Transfer learning of skills between humanoid robots.
 - Behavioral cloning of whole-body movements

IXION Industry and Aerospace

Madrid, Spain

ROBOTICS ENGINEER

June 2013 - Oct. 2015

- Design, programming and implementation of locomotion, perception, localization, SLAM and motion planning algorithms for the autonomous robots of the company: unmanned multi-rotors vehicles (UAS), unmanned ground vehicles (UGV) and autonomous underwater vehicles (AUV) in ROS.
- Simulation of autonomous mobile robots.
- Programming of navigation algorithms of autopilot system in real-time embedded systems.
- Programming and implementation of Hardware-in-the-loop (HIL) simulation systems for the navigation of autonomous robots.
- Development and wrapping of sensor drivers in real-time embedded systems.

Universidad Carlos III de Madrid

Madrid, Spain

ROBOTICSLAB - HUMANOIDS GROUP RESEARCH COLLABORATOR

Mar. 2013 - July 2015

- Design, programming and implementation of whole-body trajectory generation algorithms for TEO, the full-size humanoid robot of the Humanoids group.
- Simulation of a humanoid robot in Gazebo simulator.
- Design and development of ROS nodes in C++ and Python.
- Development of a MATLAB® graphical user interface (GUI) for the generation of whole-body trajectories for TEO humanoid robot.
- Development of shell scripts for GNU/Linux Operating Systems.

Barrick Gold Corporation – Minera Barrick Misquichilca S.A.

Huaraz, Peru

INTERN

Jan. 2011 - Dec. 2011

- Data analysis and use of data mining techniques to obtain information from the databases of the company.
- Employee personal data update and generation of reports in Oracle R12 System.
- Statistics, indicators and documentation update of the Human Resources Quality Management System according to ISO 9001 standard.

Professional Development

Deep Learning and Bayesian Methods

Moscow, Russia

DEEP|BAYES, SAMSUNG RESEARCH, NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS (HSE)

August 2018

An Introduction to Spatial (6D) Vectors and their use in Robot Dynamics

Genoa, Italy

ISTITUTO ITALIANO DI TECNOLOGIA

March 2017

REGML: Regularization Methods for Machine Learning

Genoa, Italy

UNIVERSITÀ DEGLI STUDI DI GENOVA

June 2016

Machine Learning: A computational Intelligence Approach

Genoa, Italy

UNIVERSITÀ DEGLI STUDI DI GENOVA

June 2016

Control of Mobile Robots

Coursera (MOOC)

GEORGIA INSTITUTE OF TECHNOLOGY

Mar. 2014

Autonomous Mobile Robots - AMRx

edX (MOOC)

ETH ZURICH (ETHz)

Feb 2014

Machine Learning

Coursera (MOOC)

STANFORD UNIVERSITY

July 2013