

# Curriculum Vitae

## Personal information

Surname(s) / First name(s)

Address(es)

Telephone(s)

Email(s)

Nationality(-ies)

Date of birth

Gender

**Castello Ferrer, Eduardo**

MIT Media Lab, 75 Amherst St, Cambridge, MA 02139, Boston (USA)

+34 697246098

ecstll@mit.edu

Spanish

1/12/1984

Male

## Work experience

Dates

Occupation or position held

Name and address of employer

Main activities and responsibilities

Sep 2019 - present

Research affiliate

[City Science Group, MIT Media Lab](#), Massachusetts Institute of Technology, 77 Mass. Ave., E14/E15, Cambridge, MA 02139-4307 USA.

Conduct research on how distributed robotics systems provide new ways to improve mobility, last-mile logistics, and health-related issues in urban areas.

Dates

Occupation or position held

Name and address of employer

Main activities and responsibilities

Sep 2019 - Sep 2020

Postdoctoral Fellow

[IRIDIA, ULB](#), Avenue Adolphe Buyl 87, 1050 Ixelles, Belgium.

Implement methods to encapsulate cooperative missions in real-robot systems by using blockchain-based data structures.

Dates

Occupation or position held

Name and address of employer

Main activities and responsibilities

Sep 2017 - Sep 2019

Postdoctoral fellow

[Human Dynamics Group, MIT Media Lab](#), Massachusetts Institute of Technology, 77 Mass. Ave., E14/E15, Cambridge, MA 02139-4307 USA.

Explored the combination of swarm robotics systems and blockchain technology to implement new security, behavior and business models.

Dates

Occupation or position held

Name and address of employer

Main activities and responsibilities

Feb 2016 - Sep 2017

Postdoctoral associate

[Open Agriculture Initiative, MIT Media Lab](#), Massachusetts Institute of Technology, 77 Mass. Ave., E14/E15, Cambridge, MA 02139-4307 USA.

Conducted research on the synergy between robotics and controlled-environment devices to discover, analyze, and integrate new techniques for precision agriculture.

Dates

Occupation or position held

Name and address of employer

Main activities and responsibilities

Sep 2011 - Mar 2012

Research intern

[Institute of Automatic Control Engineering \(LSR\)](#), Technische Universität München (TUM), Theresienstrasse 90, D-80333 München, Germany

Designed several communication modules for the [EU FP7 BEAMING](#) project. This internship led to a collaboration project between LSR and Osaka University.

## Education and training

Dates	Apr 2012 - Sep 2016
Title of qualification awarded	PhD. Eng. Robotics
Principal subjects covered	Multi-agent systems, swarm robotics, stochastic control, distributed systems
Name and type of organization providing education and training	Osaka University (Japan)
Level in national or international classification	1st - First Class Honors
Dates	Apr 2009 - Mar 2011
Title of qualification awarded	M.Eng. Robotics
Principal subjects covered	Advanced robotic systems, sensory information processing, pattern recognition, imaging systems
Name and type of organization providing education and training	Osaka University (Japan)
Level in national or international classification	1st - First Class Honors
Dates	Sep 2006 - Jul 2007
Title of qualification awarded	BSc.(Hons) Intelligent Systems
Principal subjects covered	Neural networks and genetic algorithms, data mining, fuzzy logic, scientific computing, intelligent systems programming
Name and type of organization providing education and training	University of Portsmouth (UK)
Level in national or international classification	2:1 - Upper Second Class Honors
Dates	Sep 2003 - Jun 2006
Title of qualification awarded	HND. Software Engineering
Principal subjects covered	Structured programming, systems analysis, software engineering, networking, database design
Name and type of organization providing education and training	ESAT (Escola Superior D'Art i Tecnologia) (Spain)
Level in national or international classification	2:1 - Upper Second Class Honors

## Teaching

Dates	Sep 2017 - Feb 2018
Course name	2.12 - Introduction to robotics
Occupation or position held	Lecturer and teaching assistant
Principal subjects covered	Robot kinematics and dynamic control, computer vision, estimation and machine learning, ROS and software architecture, robot programming, etc.
Name and type of organization providing education and training	Massachusetts Institute of Technology (MIT) - Department of Mechanical Engineering
Dates	Feb 2017 - Sep 2017
Title of qualification awarded	Kaufman teaching certificate
Principal subjects covered	Interactive teaching, active and constructive Learning, course design and delivery, planning and facilitating class sessions, inclusive teaching
Name and type of organization providing education and training	Massachusetts Institute of Technology (MIT) - Teaching and Learning Lab

## Technical skills and competences

**Programming:** C/C++, Java, Python, R, Go, PHP, Lisp, UNIX shell scripting, GNU make, AppleScript, SQL, DVCS (Mercurial, GIT), VCS (RCS, CVS, SVN, SCCS)

**Robotics software:** ROS, Player/Stage/Gazebo, Webots, OpenRTM-aist

**Robotics and machine learning libraries:** OpenCV, Torch, Caffe, mpack

**Computer-aided design:** 3DS SolidWorks, Cadence OrCAD, SPICE, pst-circ

**MATLAB experience:** linear algebra, Fourier transforms, nonlinear numerical methods, polynomials, statistics,  $N$ -dimensional filters, visualization.

**MATLAB toolboxes:** neural networks, communications, control system, filter design, genetic algorithm and direct search, signal processing, system identification.

**Embedded systems:** software and hardware development with several MCU and DSP platforms (e.g., Motorola MCU's, Texas Instruments DSP's, Atmel ATmega MCU's, and Microchip PIC MCUs)

**Instrumentation and control:** dSPACE hardware (e.g., RTI1104) and Control Desk software, Simulink, LabVIEW and other National Instruments control and data acquisition hardware and software (e.g., MIO, SMIO, DSA, and DMM)

**Information technology:** Networking (UDP, TCP, ARP, DNS, advanced routing & switching, QoS, firewall design), and service software (Apache, SQL, MediaWiki, POP, IMAP, SMTP, application-specific daemon design)

**Computer applications:** T<sub>E</sub>X (L<sup>A</sup>T<sub>E</sub>X, B<sub>I</sub>B<sub>T</sub>E<sub>X</sub>, P<sub>S</sub>Tricks), most common productivity packages (for Windows, OS X, and Linux platforms), and Vim

**Operating systems:** Linux, BSD, Microsoft Windows family, Apple OS X, IRIX, AIX, Solaris, and other UNIX variants

## Personal skills and competences

Mother tongue(s)

Other language(s)

*Self-assessment  
European level<sup>(\*)</sup>*

**English**  
**Italian**  
**Japanese**

## Spanish, Catalan

English (Fluent), Italian (Fluent), Japanese (Conversational)

Understanding		Speaking		Writing
Listening	Reading	Spoken interaction	Spoken production	
C2	C2	C2	C2	C2
C2	C1	C1	C1	C1
B2	B2	B2	B2	B2

<sup>(\*)</sup> Common European Framework of Reference (CEF) level

## Selected publications

**Eduardo Castello**, Thomas Hardjono, Alex Pentland and Marco Dorigo. "Secure and secret cooperation of robotic swarms by using Merkle trees", *Science Robotics* (under review), 2020.

Volker Strobel, **Eduardo Castello** and Marco Dorigo. "Blockchain Technology Secures Robot Swarms: A Comparison of Consensus Protocols and Their Resilience to Byzantine Robots", *Frontiers in Robotics and AI*, 2020.

A. L. Alfeo, **Castello Ferrer, E.**, et al., "Urban Swarms: A new approach for autonomous waste management", 2019 International Conference on Robotics and Automation (ICRA 2019).

**Eduardo Castello**, Ognjen (Oggi) Rudovic, Thomas Hardjono and Alex ('Sandy') Pentland, "RoboChain: A Secure Data-Sharing Framework for Human-Robot Interaction", in the Tenth International Conference on eHealth, Telemedicine, and Social Medicine (eTELEMED), 2018, **(Best Paper Award)**.

Volker Strobel, **Eduardo Castello** and Marco Dorigo. "Managing Byzantine Robots via Blockchain Technology in a Swarm Robotics Collective Decision Making Scenario", Proceedings of the 17<sup>th</sup> Conference on Autonomous Agents and MultiAgent Systems. International Foundation for Autonomous Agents and Multiagent Systems (AAMAS 2018).

**Eduardo Castello**, "The blockchain: a new framework for robotic swarm systems", in *Future Technologies Conference (FTC 2018)*, Vancouver, Canada, 2018.

**Eduardo Castello**, "A wearable general-purpose solution for Human-Swarm Interaction", in *Future Technologies Conference (FTC 2018)*, Vancouver, Canada, 2018.

**Eduardo Castello**, Tomoyuki Yamamoto, Fabio Dalla Libera, Wenguo Liu, Alan F. T. Winfield, Yutaka Nakamura and Hiroshi Ishiguro, "Adaptive foraging for simulated and real robotic swarms: the dynamical response threshold approach", *Swarm Intelligence*, 2016.

**Eduardo Castello** and Y. Sinan Hanay, "Demo: A Low-cost, Highly Customizable Robotic Platform for Testing Mobile Sensor Networks", in *ACM Symposium on Mobile Ad Hoc Networking and Computing (MOBIHOC 2015)*, Hangzhou, China. June 22 - 25, 2015.

**Eduardo Castello**, Tomoyuki Yamamoto, Yutaka Nakamura and Hiroshi Ishiguro, "Foraging Optimization in Swarm Robotic Systems based on an Adaptive Response Threshold Model", *RSJ International Journal of Advanced Robotics*, 2014.

**Eduardo Castello**, Tomoyuki Yamamoto, Yutaka Nakamura and Hiroshi Ishiguro, "Foraging in Real and Simulated environments for a Robotic Swarm based on an Adaptive Response Threshold Model", in *IEEE International Conference on Robotics and Automation (ICRA 2014)*, Multi-Robot Systems Workshop. Hong Kong, China. May 31 - June 7, 2014.

**Eduardo Castello**, Tomoyuki Yamamoto, Yutaka Nakamura, Yoshio Matsumoto and Hiroshi Ishiguro, "Task Allocation for a Robotic Swarm Based on an Adaptive Response Threshold Model", in *ICCAS, International Conference on Control, Automation and Systems, 2013*. **(Student Paper Award)**.

## Patents

Castello, Eduardo. 2015. Highly-customizable robotic platform for testing mobile sensor networks. Spanish patent application P201500298, filed April 2015. Granted August 2017.

## Selected honors and awards

Date	Sep 2017
Award	Marie Skłodowska-Curie Global Fellowship (MSCA-IF-GF) offered by the European Commission (10% acceptance rate)
Date	Apr 2014
Award	Yoneyama Scholarship offered by the Rotary Yoneyama Memorial Foundation (25 merit-based scholarships awarded over a base of 25,000 students)
Date	Jul 2013
Award	Murata Overseas Scholarship Academic Award offered by the Murata Foundation (10 merit-based scholarships awarded over a base of 10,000 students)
Date	Apr 2012
Award	1 of 25 Honors Scholarships offered by the Japanese Student Service Organization (JASSO)
Date	Oct 2010
Award	1 of 10 Monbukagakusho Research Scholarships offered by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT)

## Media collaborations

Dates	Oct 2014 - present
Name of the media	El País
Main activities and responsibilities	Columnist for the science and technology section
Dates	Oct 2014 - present
Name of the media	El Mundo
Main activities and responsibilities	Columnist for the innovation and entrepreneurship section

## Lectures and presentations

Date	October 2017
Venue	EmTech Europe - Toulouse (France)
Topic	Designing robots to transform our way of life
Date	January 2016
Venue	Global Robot Expo (GREX)
Topic	Swarm robotics: from academic-research to widespread industrial use

Date	March 2014
Venue	Fundación Valenciana de Estudios Avanzados (FVEA)
Topic	Big challenges of Japanese society: an open window to the world of robots
Date	March 2014
Venue	Universidad de Valencia (History of Art and Visual Culture Department)
Topic	Digital culture in Japan: an open window to the world of robots

## References

[Alex 'Sandy' Pentland](#), Professor, Human Dynamics Group, Media Lab, Massachusetts Institute of Technology, 77 Mass. Ave., E14/E15, Cambridge, MA 02139-4307. (USA) TEL: +1 (617) 253-3818

[Marco Dorigo](#), Professor, IRIDIA (Institut de Recherches Interdisciplinaires et de Développements en Intelligence Artificielle), Université Libre de Bruxelles, Av. Franklin Roosevelt 50. Brussels, B-1050. (Belgium) TEL: +32 (0)2 6503169

[Hiroshi Ishiguro](#), Professor, Graduate School of Engineering Science, Toyonaka Campus, Osaka University, 1-3 Machikaneyama, Osaka, 565-8531. (Japan) TEL: +81-6-6850-6360

[Alan FT Winfield](#), Professor, Faculty of Environment and Technology, University of the West of England, Bristol Coldharbour Lane, Bristol BS16 1QY. (UK) TEL: +44 117 328 2644

[Yoshio Matsumoto](#), Group Leader, Service Robotics Research Group, Intelligent Systems Institute, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba Central 2, 1-1-1 Umezono, Tsukuba, Ibaraki 305-8568 (Japan) TEL: +81-2-9861-3427