



# Jaime Duque Domingo

Professor and Researcher at the University of Valladolid

## EXECUTIVE SUMMARY

Jaime Duque Domingo holds a PhD in Systems and Control Engineering (UNED, 2018) and a master's degree in Software Engineering and Computer Systems (UNED, 2014). For 18 years, he worked on the development of complex IT projects for the private sector, both in Spain and abroad. During the last few years, he has focused on the academic world, obtaining his PhD and participating in different research projects. He has published several papers in Q1 & Q2 journals and at international conferences, in addition to a book on computer vision and a chapter in a book on robotics. He has also obtained several prizes during this stage. He is currently an assistant professor at the University of Valladolid. His field of activity is mainly focused on computer vision and robotics, specializing in deep neural networks. He has recently researched combined classification models to solve the problem of One Shot Learning as well as models of activity recognition through vision and sensors.


## RESEARCH


Publications in Q1/Q2 JCR journals:

- Development of a Human-Robot Interface for Cobot Trajectory Planning Using Mixed Reality. Electronics (2024).
- An Unsupervised Method to Recognise Human Activity at Home Using Non-Intrusive Sensors. Electronics. (2023).
- One Shot Learning with class partitioning and cross validation voting (CP-CVV). Pattern Recognition. Elsevier (2023).
- SDHAR-HOME: A Sensor Dataset for Human Activity Recognition at Home. Sensors (2022).
- Improving Human Activity Recognition Integrating LSTM with Different Data Sources: Features, Object Detection and Skeleton Tracking. IEEE Access (2022).
- Cross Validation Voting for Improving CNN Classification in Grocery Products. IEEE Access (2022).
- Improvement of One-Shot-Learning by Integrating a Convolutional Neural Network and an Image Descriptor into a Siamese Neural Network. Applied Sciences (2021).
- Daily Human Activity Recognition Using Non-Intrusive Sensors. Sensors (2021).
- Visual Recognition of Gymnastic Exercise Sequences. Application to Supervision and Robot Learning by Demonstration. Robotics and Autonomous Systems. Elsevier (2021).
- Optimization and Improvement of a Robotics Gaze Control System using LSTM networks. Multimedia Tools and Applications (2021).
- Egyptian Shabtis Identification by Means of Deep Neural Networks and Semantic Integration with Europeana. Applied Sciences (2020).
- Gaze control of a robotic head for realistic interaction with humans. Frontiers in Neurobotics (2020).
- Integration of Computer Vision and Wireless Networks to Provide Indoor Positioning. Sensors (2019).
- An improved indoor positioning system using RGB-D cameras and wireless networks for use in complex environments. Sensors (2017).
- Deciphering Egyptian hieroglyphs: Towards a new strategy for navigation in museums. Sensors (2017).
- Indoor Positioning System using Depth Maps and Wireless Network. Journal of Sensors (2016).

Publications in books:

- Visión Artificial mediante Aprendizaje Automático con Tensorflow y Pytorch. Ra-Ma. (2023). ISBN: 978-84-19444-82-0.
- Chapter «Robótica, realidad virtual y tecnologías relacionadas para la detección, atención e intervención en TEA» in the book «Autismo y Nuevas Tecnologías». Ra-Ma. (2023). ISBN: 978-84-19857-99-6


 [jaimeduque.uva.es](http://jaimeduque.uva.es)

 Depto. Ingeniería de Sistemas y Automática  
E. de Ingenierías Industriales - Sede Doctor Mergelina  
Universidad de Valladolid  
Paseo Prado de la Magdalena 3-5, 47011

 [jaime.duque@uva.es](mailto:jaime.duque@uva.es)

 +34 685136385

 0000-0001-6649-5550

 <https://es.linkedin.com/in/jaime-duque-domingo-bb576565>

## LANGUAGES

English – C1

French – B1

Spanish – Native

## MORE ABOUT ME

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#### Publications in congresses/conferences:

- Mejora en la clasificación de actividades mediante redes de convolución y CVV-SV. JREB, **2023**. Madrid.
- Reconocimiento de actividades humanas aplicando modelos de Aprendizaje Profundo. JREB, **2023**. Madrid.
- Sistema de monitorización no intrusiva para vivienda de personas mayores. JREB, **2023**. Madrid.
- Teleoperación de un robot colaborativo mediante realidad virtual. JREB, **2023**. Madrid.
- Sistema de monitorización no intrusiva para el reconocimiento de actividades de la vida diaria en entornos multiusuario. JREB, **2022**. Málaga.
- Optimization of a Robotics Gaze Control System. WAF **2020**. Madrid.
- Locating Multiple Camera Sensors and Wireless Access Points for a Generalized Indoor Positioning System. ICWMC, **2017**. Niza (Francia)
- A Semantic Approach to Enrich User Experience in Museums Through Indoor Positioning. UCAMI, **2017**. Filadelfia (EEUU)
- Mejoras en el algoritmo de posicionamiento en interiores mediante sensores RGB-D y redes WiFi. JNA **2018**. Badajoz.
- A Vision-Based Strategy to Segment and Localize Ancient Symbols Written in Stone. Iberian Robotics Conference. **2017**. Sevilla.
- Experiencias de Predicción para un Sistema de Posicionamiento de uso en Recintos de Interior basado en Cámaras 3D de Bajo Coste y Redes Inalámbricas. JNR 2017. Valencia.
- Indoor Positioning Prediction System based on Wireless Networks and Depth Sensing Camera. JNA **2016**. Madrid.
- People Positioning System with Low-cost 3D Cameras and Wireless Devices for Indoor Environments. Robocity **2016**. Madrid.
- Localización de personas mediante cámaras RGB-D y redes inalámbricas. JNA **2015**. Bilbao.

#### Participation in research projects:

- ROSOGAR. Social robotics for the care of the elderly at home. University of Valladolid (2023/ongoing)
- EIAROB. Ambient intelligence ecosystem for long-term care at home and in residential care facilities using social robots. University of Valladolid / CARTIF (2023/ongoing)
- Intelligent VISual computing for products / processes of the AGRIfood sector. CARTIF (2021/2022)
- ROASIS - Robots with the capacity for interaction and adaptation in healthcare environments. University of Valladolid (2019/2021)
- Virtual reconstruction of complex scenes in inhabited interiors using Ubiquitous computing-assisted 3D virtual information. UNED (2017/2018)

#### Research stays:

- 3 months at the Human Sensing Lab of the Robotics Institute at Carnegie Mellon University (United States of America). 2023.

#### Prizes:

- Michelin 2023 Prize. Best final research project, participating as a tutor.
- Innovadores 2022 Prize, awarded by Iberdrola and the newspaper El Mundo for the best University Research Project.
- Extraordinary Doctorate Prize of the UNED, awarded in November 2020.
- IARIA-ICWMC 2017. Best paper presented at the International Conference on Wireless and Mobile Communications (Nice, France, 2017)
- INFAIMON 2018, Best paper on computer vision presented at the Jornadas Nacionales de Automática (Badajoz, 2018)
- INFAIMON 2015. Best paper on computer vision presented at the Jornadas Nacionales de Automática (Bilbao, 2015)

## TEACHING

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Professor of different university subjects:

- Fundamentals of Computer Science. University of Valladolid (2021/22 → Currently)
- Fundamentals of Automatics. University of Valladolid (2022/23 → Currently)
- Computer Vision. University of Valladolid (2021/22 → Currently)
- Fundamentals of Machine Learning. UEMC university (2021/22)
- Information Systems. UEMC university (2019/20 to 2021/22)
- Computer Consultancy. UEMC university (2019/20 to 2021/22)

Direction of 5 final degree projects and tutoring of 2 internships in companies.

## ACADEMIC BACKGROUND

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2018 · PhD in Systems and Control Engineering – UNED

2018 · Master of Education (Mathematics) – University Isabel I

2014 · Master's Degree in Software Engineering and Computer Systems – UNED

2011 · Bachelor's Degree in Computer Engineering – Universidad de Valladolid

2000 · Associate Degree in Computer Engineering – Universidad de Valladolid

## WORK EXPERIENCE

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Assistant Professor – **University of Valladolid**

09/2022 – Currently

Professor of different subjects, including Fundamentals of Computer Science, Fundamentals of Automatics, or Computer Vision. Researcher in deep learning applied to computer vision and social robotics.

Associate Professor – **European University Miguel de Cervantes. UEMC**

09/2019 – 08/2022

Professor of different subjects, including Fundamentals of Machine Learning, Information Systems, and IT Consulting.

Researcher – **CARTIF, Valladolid**

04/2021 – 09/2022

Research on combined classification models and learning from a single sample.

Postdoctoral Researcher – **University of Valladolid**

07/2019 – 03/2021

Research on Human-Robot-Interaction using machine learning approaches.

IT Analyst – **ATOS IT, Valladolid**

01/2018 – 06/2019

Participation in the development of the French social security information system.

IT Expert – **European Commission, Brussels**

01/2017 – 12/2017

Participation in the development of the new e-Procurement IT system of the European Commission, working at the Directorate-General Informatics (DG DIGIT).

Analyst – **Unión Duero**

04/2001 – 01/2017

Participation in the development of the insurance contracting systems of the banks Unicaja, Caja España and Caja Duero, owners of the insurance company, Unión Duero.

Developer – **MachinePoint**

10/2000 – 04/2001

Development of the online sales portal for MachinePoint, one of the largest suppliers of reused industrial machinery.

Professor – **Cybersistemas**

06/2000 – 08/2000

Professor of several Java and C++ courses.

University scholarship – **Renault**

10/1999 – 04/2000

Participation in the development of a production planning system for the welding workshop.