Part A. PERSONAL INFORMATION

First name	Alfredo		
Family name	Cuesta-Infante		
e-mail	alfredo.cuesta@urjc.es	**URL Web** caporesearch.es/acuesta/	
Open Researcher and Contributor ID (ORCID)		0000-0002-3328-501X	

CV date	January 1st, 2024

A.1. Current position

Position	Associate Professor (Profesor Titular)
Initial date	19 / April / 2021
Institution	Universidad Rey Juan Carlos
Department/Center	Escuela Técnica Superior de Ingeniería Informática
Country	Spain
Key words	Deep Learning, Computer Vision, Copula functions

Country	Spain	**Telephone number** 91.488.8567

A.2. Previous positions (research activity interruptions, art. 14.2.b))

Period	Position/Institution / Country
2014-2020	Prof. Visitante, Univ. Rey Juan Carlos (URJC), Spain
2020-2021	Prof. Contratado Doctor Interino, URJC, Spain
2021	Prof. Contratado Doctor,URJC, Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Ms. in Physics	Univ. Complutense de Madrid, Spain	1998
PhD. in Computer Engineering	Univ. Nacional de Educación a Distancia, Spain	2006

Part B. CV SUMMARY *(max. 5000 characters, including spaces)*

Regarding my research trajectory, during the last ten years I have published 4 papers in tier 1 conferences, with rating A++ in the GGS ranking, together with 8 papers in journals ranked Q1 and 2 more in Q2. My line of work is real-life problems and the application of Machine Learning. The metrics of my publications are:

Organization	h-index	Citations
WoS (L-3708-2014)	10	512
Scopus (35955730700)	11	834
Google Scholar (OQsC-14AAAAJ)	16	2021

I have been working with Dr. Kalyan Veeramachaneni and his group, "Data-to-AI", at the Laboratory of Intelligent and Decision Systems (LIDS), in MIT during 10 years. This lasting collaboration is the result of different postdoc stays at University of New Mexico (UNM) and MIT between 2008 and 2018, for a total time of almost 20 months. With this group, I have recently come involved in fairness, a hot topic in artificial intelligence (AI) nowadays. Our contribution expands the knowledge on online discriminative algorithms which is closer to real-life scenarios than having a full curated dataset from the beginning [C1.1] Another relevant line I keep since long ago is synthetic data generation. This topic is very demanded due to the lack of data, mainly because of privacy constraints. I have published a work that is currently State-of-the-Art in tabular data generation based on Conditional Generative Adversarial Networks (GAN) [C1.4] and a method based on Vine models [C1.5]. Also related to data generation and vines, I have published a method to estimate wind resources [C1.7]. Additionally, I have participated in other works that were presented in different conferences. Among them, [C2.1] consists of a generative method for anomaly detection, [C2.3] models log data in cybersecurity

and [C2.5] models longitudinal ECG and ABP data from patients in Intensive Care. Additionally, I have worked in auto-ML [C2.2 and 4]. Given the number of hyper-parameters in ML models, this topic has become a key to democratize data-driven AI modern techniques.

On the other hand, my research with URJC is developed within the group CAPO (Advanced Computation, Perception and Optimization), working on computer vision solutions to real-life problems, particularly interested in smart city contexts. In [C1.3] we do semi-supervised learning to recognize different types of dumpsters.

Also with CAPO I have participated in 13 research contracts with several Spanish companies, two from USA and one from Italy, being leader of the contract in 4 of them. In these contracts I would highlight the strong commitment to the welfare of society: cybersecurity [C4.4], augmented reality for the visually impaired [C4.5], circular economy [C4.6] and waste management [C4.8].

Previously I have worked with a research group in Universidad Complutense (UCM) in bioinspired algorithms in real-life problems such as Chip flooplanning or gluco-regulatory modeling [C1.8-10]. With them I am listed as inventor in an accepted patent.

Regarding my academic experience, I began to teach Computer Science in Centro de Estudios Superiores Felipe II, an University College depending from UCM in 1999. In 2015 I joined the E.T.S. de Ingeniería Informática at URJC as visiting professor. On Nov 25, 2021 I was proposed to hold an Associate Professor position. Being URJC faculty I obtained 1 three-year Docentia (teaching quality acknowledgement). During this time, I have taught several and diverse subjects such as Digital design, Information systems, Artificial intelligence, or Cybersecurity. I also teach Pattern Recognition in the URJC Master of Computer Vision, which allows students to pursue a PhD once graduated. I also have been advisor in one doctoral thesis and currently I am supervising other five.

As a result of this trajectory, I have been granted 2 six-year research periods (2009-2014 and 2015-2020) and 4 five-year teaching periods.

Part C. RELEVANT MERITS *(sorted by typology)*

C.1. Selected Publications

1. "Towards Reducing Biases in Combining Multiple Experts Online".
   Y. Sun, I. Ramírez, A. Cuesta-Infante, K. Veeramachaneni;
   in Int. Joint Conf. on Artificial Intelligence, 3024-3030 (2021)   [ranking GGS, class 1]

2. "Bayesian Capsule Networks for 3D human pose estimation from single 2D images".
   I. Ramírez; A. Cuesta-Infante, E. Schiavi, J.J. Pantrigo;
   en Neurocomputing 379, 64-73 (2020)   [IF 4.072 ,Q1]

3. "Convolutional neural networks for computer vision-based detection and recognition of dumpsters"; I. Ramírez, A. Cuesta-Infante, J.J. Pantrigo, A.S. Montemayor, et al.
   in Neural Computing and Applications , 32(17), 13203-13211(2020).   [IF 4.664,Q1]

4. "Modeling tabular data using conditional GAN"
   L. Xu, M. Skoularidou, A. Cuesta-Infante, K. Veeramachaneni;
   in NeurIPS, 5049-5057 (2019)   [ranking GGS, class 1]

5. "Learning Vine Cópula Models For Synthetic Data Generation"
   Y. Sun, A. Cuesta-Infante, K. Veeramachaneni;
   in AAAI, 33, 5049-5057 (2019)   [ranking GGS, class 1]

6. "Lightweight Tracking-by-Detection system for multiple pedestrian targets"
   B. Lacabex, A. Cuesta-Infante, A.S. Montemayor, J.J. Pantrigo,
   in Integrated Computer-Aided Engineering, 23: 299-311 (2016).   [IF 5.264, Q1]

7. "Copula Graphical Models for Wind Resource Estimation";
   K. Veeramachaneni, A. Cuesta-Infante, U.M. O'Reilly,
   in Int. Joint Conf. on Artificial Intelligence (2015), 2646-2654.   [ranking GGS, class 1]

8. "Comparative study of meta-heuristic 3D floorplanning algorithms";
A. Cuesta-Infante, J.M. Colmenar, Z. Bankovic, J.L. Risco-Martín, M. Zapater, J.I. Hidalgo, J.L. Ayala, J.M. Moya; in Neurocomuting (150), 67-81 (2015)   [IF 4.072, Q1]

9. "Modeling Glycemia in humans by means of Grammatical Evolution"; J.I.Hidalgo, J.M.Colmenar, J.L.Risco-Martín, A. Cuesta-Infante, E.Maqueda, M.Botella, J.A.Rubio; in Applied Soft Computing, Vol.20, 40-53 (2014)   [IF 2.810, Q1]

10. "glUCModel: A monitoring and modeling system for chronic diseases applied to diabetes"; J.I.Hidalgo, E.Maqueda, J.L.Risco-Martín, A. Cuesta-Infante, J.M.Colmenar, J.Nobel; in Journal of Biomedical Informatics 48, 183-192 (2014)   [IF 2.194, Q1]

(*IF = Impact Factor*)

C.2. Selected International Congress

1. "TadGAN: Time series anomaly detection using generative adversarial networks";
A Geiger, D Liu, S Alnegheimish, A Cuesta-Infante, K Veeramachaneni;
in IEEE Int. Conf. on Big Data, 33-43 (2020) -- oral   [ranking GGS, class 3, AR=18%, oral]

2. "ATM: A distributed, collaborative, scalable system for automated machine learning";
T. Swearingen, W. Drevo, B. Cyphers, A. Cuesta-Infante, A. Ross, K. Veeramachaneni;
in IEEE Int. Conf. on BigData, 151-162 (2017)   [ranking GGS, class 3, AR=18%, oral]

3. "Learning representations for log data in cybersecurity"
I. Arnaldo, A. Cuesta-Infante, A. Arun, M. Lam, C. Bassias, K. Veeramachaneni;
in Int. Conf. on Cybersecurity, Cryptography and Machine Learning, 250-268 (2017)   [oral]

4. "Sample, estimate, tune: Scaling bayesian auto-tuning of data science pipelines";
A. Anderson, S. Dubois, A Cuesta-Infante, K Veeramachaneni
in IEEE Int. Conf. on Data Science and Advanced Analytics, 361-372 (2017)   [oral]

5. "Markov Switching Copula Models for Longitudinal Data"
A. Cuesta-Infante, K. Veeramachaneni
in IEEE 16th Int. Conf. on Data Mining Workshops, 1104-1109 (2016)   [oral]

6. "An evolutionary methodology for automatic design of finite state machines";
JM Colmenar, A Cuesta-Infante, JL Risco-Martín, JI Hidalgo;
Companion Proc. of the 15th Genetic and Evolutionary Computation Conf.,139-140 (2013) [poster]

(*AR = Acceptance rate, oral = oral presentation*)

C.3. Research projects

1. "EyeOT, Ojos inteligentes para gemelos digitales",
Agencia Estatal de Investigacion (PID2021-128362OB-I00)
IP: Alfredo Cuesta, Raúl Cabido. Importe: 91.839 €.   (2022 - 2025)

2. "Pollutwin, Gemelo Digital de Alta Fidelidad de las Fuentes Móviles de Contaminantes en Ciudades", Agencia Estatal de Investigacion (TED2021-129162B-C22)
IP: Antonio Sanz. Importe: 138.000€.   (2022 - 2024)

3. "FotoCaos, New computational methods for simulating and optimization of photochemical processes", Comunidad de Madrid (Y2018/EMT-5062)
IP: Antonio Sanz. Importe: 133.100 €.   (2019 - 2021)

4. "SmartEyes, Smart Eyes for Smart Cities", MINECO (RTI2018-098743-B-I00)
IP: Alfredo Cuesta, Juan J. Pantrigo. Importe: 98.857 €.   (2019 - 2021)

5. "HARAMI, Human Activity Recognition with AMbient Intelligence methods",
MINECO (TIN2015-69542-C2-1-R)
IP: Juan J. Pantrigo, Antonio Sanz. Importe: 85.668 €.   (2016 - 2018)

6. "IYELMO, PaaS for trading", INNPACTO (IPT-2011-1198-430000)
IP: J. Ignacio Hidalgo. Importe: 152.080 €.   (2011 - 2013)

C.4. Contracts (art.83), technological or transfer merits

Contracts as IP or Co-IP

1. "Research on techniques for automated recognition of mechanical noise perceived by passengers in a car" (BE CAE & Test, 2021)

2. "Exploring deep learning techniques for automatic recognition of terrain features using remote sensing" (Simbiotica, 2018)

3. "Research and development of soft computing techniques for geospatial data analysis" (AMS Geomatics, 2018)

4. "Developing advanced statistical methods for clustering, classification and novelty detection in the context of cybersecurity" (PatternEx, 2015)

Contracts as research team

5. "Integration of artificial intelligence and mixed reality methods to improve the perception and navigation of people with low vision in urban environments" (BielGlasses, 2017-2021).

6. "Development of computer vision systems applied to the technological transformation of the waste recovery sector for the implementation of an effective circular economy in the industry" (Pixelabs, 2021).

7. "Computer Vision for Automotive Applications" (Navmii Labs Inc., 2018)

8. "Image recognition of waste containers using advanced machine learning techniques" (Ecoembes, 2017)

Patents

- "Method for modelling the blood sugar level by genetic programming"; granted in 2016.