

Part A. PERSONAL INFORMATION

CV date	Nov. 2020
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First and Family name	Begoña C. Arrue	
Social Security, Passport, ID number		
Researcher codes	Open Researcher and Contributor ID (ORCID**)	0000-0003-1777-2675
	SCOPUS Author ID (*)	35605607400
	WoS Researcher ID (*)	O-9525-2015

A.1. Current position

Name of University/Institution	Universidad de Sevilla		
Department	Escuela Técnica Superior de Ingeniería		
Address and Country	Avda. Camino de los Descubrimientos, s/n		
Phone number	+34 954487354	E-mail	barrue@us.es
Current position	Associated Professor	From	14/02/1998
Key words	Robotics, aerial and multi-robot systems, perception, manipulation, planning, soft-robotics and AI for Robotics.		

A.2. Education

PhD	University	Year
Ph.D. Electrical Engineering	University of Virginia (U.S.A)	1993

A.3. JCR articles, h Index, thesis supervised...

- Four six-year research periods granted (last on 31/12/2016) and one technology transfer period by the Ministry of Education and Science.
- Theses directed in the last 10 years: 2.
- The following metrics have been obtained from the Web of Science Core Collection:
Total Articles as author only in JCR journals: Total Articles: 49; Articles with citations: 20; Total citations: 774; Average citations per article: 8,74.
Scopus Index h: 17
Publications in first quartile (Q1 and Q2): 5 in last five years

Part B. CV SUMMARY

Graduated in Computer Science in 1987 from the University of Deusto (Spain). Master and Ph.D in Electrical Engineering from the University of Virginia (USA) in 1991 and 1993, respectively.

In 1994, she joined the Department of Systems Engineering and Automation, with a reintegration grant, at the University of Seville (Spain), where she has been researching and teaching. In 1995, she became Assistant Professor, and obtained the position of Associated Professor at the same University in 1998.

During these years, she has taught in the degrees of Industrial Engineer, Telecommunication Engineer, Automation and Industrial Electronics Engineer and Electronics Engineer in the areas of Systems Engineering and Automation and in the doctorate of Systems Engineering and Automation, Robotics and research methodology. She has also directed and co-directed numerous Master's degree projects in these areas.

Regarding her research activity, she has four recognized six-year periods (last 2011-2016), and one technology transfer period. She has worked in the areas of Robotics, Computer Science, Artificial Intelligence, Systems Engineering and Automation, and Signal Theory and Communications. She has specialized in Field Robotics including aerial robotics, multi-robot system, manipulation and planning, perception, intelligent systems and soft-robotics for field applications. She works in projects related to applications like forest fires, search and rescue, and infrastructure inspection and maintenance.

She has participated in more than 30 research projects, including EU funded projects in various Framework Programs, including the EUFIRELAB project (Energy, Environment and Sustainable Development EVG1-2001-00024 2002-2006) in which she has been the Responsible Researcher of the Spanish team. Currently, she is working in several projects such as GRIFFIN, AERIAL-CORE, PILOTING, RESIST and she is co-principal investigator of the European projects TERRINET and RIMA.

She has also coordinated 3 contracts of technological transference to companies of productive sectors like AIRBUS MILITARY and ABENGOA, and she has participated, with different degrees of responsibility, in more than 15 in companies like ITURRY, FAASA, among others. Currently, she coordinates a contract with DRONETOOLS, S.L and another with ELIMCO AEROSPACE.

Likewise, her research work is included in numerous publications: articles in prestigious journals, book chapters and conference proceedings.

She is IEEE Senior. Furthermore, she is an European evaluator, and ANEP's R&D project evaluator, and she collaborates in the evaluation processes of different autonomous government agencies (UNIBASQ and AVAP). Part of ANECA panel expert since 2012. In addition, she is an Associate Editor in RA-L and she has reviewed numerous articles in prestigious international conferences in the field of robotics such as ICRA, IROS and various articles in international journals such as SENSORS, JINT, FSJ, RIAI.

Part C. RELEVANT MERITS

C.1. Publications

- Acevedo, J.J.; Maza, I.; Ollero, A.; Arrue, B.C. An Efficient Distributed Area Division Method for Cooperative Monitoring Applications with Multiple UAVs. *Sensors* 2020, 20, 3448.
- Pablo Ramon-Soria, Begoña C. Arrue, Anibal Ollero, "Grasp Planning and Visual Servoing for an Outdoors Aerial Dual Manipulator", *Engineering*, Volume 6, Issue 1, 2020, Pages 77-88, ISSN 2095-8099, DOI: 10.1016/j.eng.2019.11.003.
- Ramon Soria, P., Arrue, B.C., Ollero, A., "A 3D-Printable Docking System for Aerial Robots: Controlling Aerial Robotic Manipulators in Outdoor Industrial Applications". *IEEE Robotics & Automation Magazine*; Volume: 26, Issue: 1, March 2019. DOI: 10.1109/MRA.2018.2884744.
- Pedro J. Sanchez-Cuevas, Pablo Ramon-Soria, Begoña Arrue, Anibal Ollero, Guillermo Heredia., "Robotic System for Inspection by Contact of Bridge Beams Using UAVs". *Sensors* 2019. 2019 Jan; 19(2): 305. Editorial: MDPI journals. DOI: 10.3390/s19020305
- Ángel R. Castaño, Fran Real, Pablo Ramón-Soria, Jesús Capitán, Víctor Vega, Begoña C. Arrue, Arturo Torres-González, Anibal Ollero, "AI-Robotics team: A cooperative multi-unmanned aerial vehicle approach for the Mohamed Bin Zayed International Robotic Challenge". *Journal of Field Robotics*, First published: 09 September 2018. <https://doi.org/10.1002/rob.21810>
- Ramon Soria, P., Arrue, B.C., Ollero, A., "Detection, Location and Grasping Objects Using a Stereo Sensor on UAV in Outdoor Environments". *Sensors* 2017, 17(1), 103; January 2017. vol. 17, Issue 1, pp 1–16, January 2017. Editorial: MDPI journals. DOI: 10.3390/s17010103
- Alejandro Suarez; Pablo Ramon Soria ; Guillermo Heredia ; Begoña C. Arrue ; Anibal Ollero, "Anthropomorphic, compliant and lightweight dual arm system for aerial manipulation". *International Conference on Intelligent Robots and Systems (IROS)*, 2017 IEEE/RSJ.
- Ramon Soria, P.; Bevec, R.; Arrue, B.C.; Ude, A.; Ollero, A. "Extracting Objects for Aerial Manipulation on UAVs Using Low Cost Stereo Sensors", *Sensors* 16(5):700 · May 2016. vol. 16, Issue 5, pp 1–19, May 2016. Editorial: MDPI journals. DOI: 10.3390/s16050700
- J.J. Acevedo, B. C. Arrue, I. Maza y A. Ollero. A "Distributed Algorithm for Area Partitioning in Grid-Shape and Vector-Shape Configurations with Multiple Aerial Robots", *Journal of Intelligent & Robotic Systems*. Volumen: 84, Issue 1, pp 543–557, December 2016. First Online: pp.1-15, 09 October 2015. Editorial: Springer Netherlands. DOI: 10.1007/s10846-015-0272-5
- J.J. Acevedo, N.R.J. Lawrance, B.C. Arrue, S. Sukkarieh and A. Ollero. "Persistent monitoring with a team of autonomous gliders using static soaring". In *IEEE/RSJ International Conference on Intelligent Robotics and Systems (IROS 2014)*. September 2014, Chicago, Illinois, USA.
- J. J. Acevedo, B. C. Arrue, J. M. Diaz-Banez, I. Ventura, I. Maza, and A. Ollero, "One-to-one coordination algorithm for decentralized area partition in surveillance missions with a team of aerial robots", *Journal of Intelligent and Robotic Systems*, vol. 74, Issue 1-2. Editor Springer Netherlands, pp. 269–285, April 2014, DOI: 10.1007/s10846-013-9938-z.

C.2. Research projects and grants

- **Title:** PILOTING. PILOTs for robotic INSpection and maintenance Grounded on advanced intelligent platforms and prototype applications. (<https://cordis.europa.eu/project/id/871542>)
Scope: International. Financing entity: E. Commission, H2020-ICT-2019-2. Project Grant ID: 871542.
Duration, from: January 1, 2020 to December 31, 2023
Grant Amount: Total project: 8.189.201,38€. Coordinator: University of Seville: 949.375 €
Researcher in charge USE Team: Anibal Ollero Baturone.
Number of participating entities: 13 Public and private research organizations, and Industry.

- **Title:** AERIAL-CORE. AERIAL COgnitive integrated multi-task Robotic system with Extended operation range and safety. (<https://cordis.europa.eu/project/id/871479>)
Scope: International. Financing entity: E. Commission, H2020-ICT-2019-2. ICT-10-2019-2020 - Robotics Core Technology. Project Grant agreement ID: 871479.
Duration, from: December 1, 2019 to November 30, 2023
Grant Amount: Total project: 8.595.306,25 €. Coordinator: University of Seville: 853.500 €
Researcher in charge: Aníbal Ollero Baturone.
Number of participating entities: 15 Public and private research organizations, and Industry.
- **Title:** GRIFFIN. General compliant aerial Robotic manipulation system Integrating Fixed and Flapping wings to INcrease range and safety. (<https://cordis.europa.eu/project/id/788247>)
Scope: International. Financing entity: - European Research Council (ERC) ERC-2017-ADG - ERC **Advanced Grant**. Grant agreement ID: 788247.
Duration, from: November 1, 2018 to: October 31, 2023
Grant Amount: Total project: 2 499 750 €. University of Seville
Researcher in charge: Aníbal Ollero Baturone.
- **Title:** RIMA. Robotics for Infrastructure Inspection and Maintenance.
Scope: International. Financing entity: E. Commission, H2020. Grant agreement ID: 824990. IA.
Duration, from: January 1, 2019 to: December 31, 2022 (<https://cordis.europa.eu/project/id/824990>)
Grant Amount: Total project: 16.048.605 €. University of Seville: 327.250 €
Researcher in charge: Aníbal Ollero Baturone / Begoña C. Arrue
Number of participating researchers: 22 Public and private research organizations.
- **Title:** TERRINet: TERRINET. The European Robotics Research Infrastructures Network. (<https://cordis.europa.eu/project/id/730994>)
Scope: International. Financing entity: European Commission, H2020. Project ID: 730994 - RIA.
Duration, from: December 1, 2017 to: November 30, 2021
Grant Amount: Total project: 4,999,236.25 €. University of Seville: 385,087.50. €
Researcher in charge: Begoña C. Arrue / Aníbal Ollero Baturone.
Number of participating researchers: 13 Public and private research organizations.
- **Title:** HYFLIER. HYbrid FLYing-rolling with-snakE-aRm robot for contact inspection. (<https://cordis.europa.eu/project/id/779411>)
Scope: International. Financing entity: European Commission (EC), H2020. Project ID: 779411-RIA.
Duration: January 1, 2018 to December 31, 2021. Grant Amount: University of Seville: 647.420€
Researcher in charge: Aníbal Ollero Baturone / Guillermo Heredia Benot.
Number of participating researchers: 9 Public and private research organizations.
- **Title:** AEROARMS: AERial RObotic system integrating multiple ARMS and advanced manipulation capabilities for inspection and maintenance (<https://cordis.europa.eu/project/id/644271>)
Scope: International. Financing entity: EC, Grant Ag. 644271, H2020-ICT-2014-1, ICT-23-2014.
Duration, from: June 1, 2015 to: May 30, 2019
Grant amount: Total project: 4.722.852.50 €. University of Seville: 695,000. €
Researcher in charge: Aníbal Ollero Baturone. AEROARMS Project Coordinator
Number of participating researchers: 12 Public and private research organizations
- **Title:** AEROBI. AERial RObotic System for In-Depth Bridge Inspection by Contact. (<https://cordis.europa.eu/project/id/687384>)
Scope: International. EC, Grant Ag. 687384.
Duration, from: December 1, 2015 to November 30, 2018
Grant amount. University of Sevilla: 376.500 €
Researcher in charge: Aníbal Ollero Baturone.
Number of participating researchers: 9 Public and private research organizations
- **Title:** AEROMAIN. Sistema de Manipulación Mediante Robots Aéreos para Mantenimiento en la Generación y Distribución de Energía. Aplicación Aerogeneradores. DPI2014-59383-C2-1-R.
Scope: National. Financing entity: Plan Estatal 2013-2016 Retos. Grant Amount: 312.180 €
Duration, from: 01-01-2015 to 31-12-2017.
Researchers in charge: Aníbal Ollero Baturone / Begoña C. Arrue Ullés

- **Title:** EC-SAFEMOBIL: Estimation and Control for Safe Wireless High Mobility Cooperative Industrial Systems (Proyecto Integrado FP7) (<https://cordis.europa.eu/project/id/2880821>)
Scope: International. Financing entity: European Commission, VII PM “Information and Communication Technologies (ICT) Programme”. Grant agreement ID: 288082.
Duration, from: July 15th, 2011 to January 14th, 2016.
Grant amount: Total project: 4,459,993. University of Sevilla: 606.384 €
Number of participating researchers: 9 Public and private research organizations
Researcher in charge: Aníbal Ollero Baturone.

C.3. Contracts, technological or transfer merits

- **Title:** AERINS - Sistemas de navegación inteligentes en cercanía de líneas eléctricas. (PI-1807/23/2019). Contract 68/83. Private
Company/Financial Administration: ELIMCO. From: 01-10-2018 to 31-10-2020
Responsible researcher: Begoña C. Arrue /Aníbal Ollero
Number of participating researchers: 6
- **Title:** AVINSPEC - Aerial photoVoltaic Inspection. Investigación en técnicas de localización precisa con múltiples sensores en UAVs sobre plantas fotovoltaicas (PI-1807/23/2018). Contract 68/83. Private
Company/Financial Administration: DRONETOOLS S.L.
From: 01-02-2018 to: 30-09-2021
Responsible researcher: Begoña C. Arrue
Number of participating researchers: 6
- **Title:** "SISEFRU" Desarrollo y validación de un sistema innovador de selección de frutas de mayor rendimiento y menores dimensiones. (PI-1472/2015). Contract 68/83. Private. Company/Financial Administration: Industrias Aeronáuticas INASOR S.L.U.
From: 01-09-2015 to: 01-02-2017
Responsible researcher: Begoña C. Arrue
Number of participating researchers: 5
- **Title:** Robot de remachado flexible en aeronaves (PI-1204/2013). Contract 68/83. Private.
Company/Financial Administration: AIRBUS MILITARY
From: 08/03/2012 to: 31/12/2014
Responsible researcher: Begoña C. Arrue
Number of participating researchers: 6
- **Title:** Robotics and Remote Sensing (ROBRESSENS). Terrestrial and Space Energy Analysis (PI-1118/23/2013). Contract 68/83. Private
Company/Financial Administration: ABENGOA S.A.
From: 16/03/2013 to: 30/04/2014
Responsible researcher: Begoña C. Arrue
Number of participating researchers: 2
- **Title:** Monitorización y medida de incendios forestales empleando helicópteros (PI-0280/2010 - Investigador). Contract 68/83. Private
Company/Financial Administration: FAASA AVIACION S.A.
From: 01/10/2009 to: 14/05/2012
Responsible researcher: Aníbal Ollero
Number of participating researchers: 5

C.5. Direction of Doctoral Theses in the last 6 years

- **Title:** Cooperation of multiple heterogeneous aerial robots in surveillance missions.
Advisors: Begoña C. Arrue/ Aníbal Ollero.
Ph.D. candidate: José Joaquín Acevedo Bañez.
University: University of Seville. Faculty/School: School of Engineering.
Date: December 2014.
- **Title:** Visual Perception System for Aerial Manipulation: Methods and Implementations.
Advisors: Begoña C. Arrue/ Aníbal Ollero.
Ph.D. candidate: Pablo Ramón Soria.
University: University of Seville. Faculty/School: School of Engineering.
Date: Abril 2019.