

**CURRICULUM VITAE ABREVIADO (CVA)**

**IMPORTANT** – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

**Part A. PERSONAL INFORMATION**

First name	Isabel		
Family name	García Morales		
Gender (*)	Woman	Birth date (dd/mm/yyyy)	31/05/1976
Social Security, Passport, ID number			
e-mail	isabelgm@uma.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)			0000-0002-1161-1806

(\*) Mandatory

**A.1. Current position**

Position	Profesora Titular de Universidad		
Initial date	24/12/2018		
Institution	Universidad de Málaga		
Department/Center	Ing. Sistemas y Automática	Escuela de Ingenierías Industriales	
Country	España	Teleph. number	
Key words	Robot control motion, surgical robotics , human robot collaboration		

**A.2. Previous positions (research activity interruptions, indicate total months)**

Period	Position/Institution/Country/Interruption cause
2001-2002	Becaria con cargo a proyecto de investigación
2003-2007	Profesora Ayudante
2007-2015	Profesora Colaboradora
2005-2018	Profesora Contratada Doctora

**A.3. Education**

PhD, Licensed, Graduate	University/Country	Year
MsC Electrical Engineer	Universidad de Málaga	2000
PhD Electrical Engineer	Universidad de Málaga	2006

(Include all the necessary rows)

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

The researcher joined the research group of the Department of Systems Engineering and Automation at the beginning of 2001. She joined the group after obtaining a research grant with health research funds from the Instituto de Salud Carlos III. Subsequently, he obtained a position as Assistant Professor, which helped him to complete his research in order to complete his doctoral thesis, and after being accredited as a doctoral assistant and as a collaborating professor, he obtained a position in the latter category in 2007. She is Associate Professor since 2018.

The researcher's CV shows a balance in the different areas of her work: teaching, research and management. As a researcher, it should be noted that the developments and knowledge acquired during her doctoral thesis led to the generation of a patent, which was extended internationally and finally to its transfer. These achievements allowed the subsequent evolution through research projects focused on the same line. In the field of teaching, she is constantly



updating her knowledge in order to apply new tools in the teaching of her subjects, as well as collaborating in educational innovation projects. Finally, the candidate has actively participated in University management, being appointed, from February 2008 to January 2012, Director of Transfer and European Research Area, taking charge of the Office of Transfer of Research Results of the University of Malaga, and the European Projects Office. In addition, since June 2021, she has been the coordinator of the degree in electronic, robotics and mechatronics engineering at the University of Málaga. Finally, we would like to highlight the continuous training that the candidate is adopting by attending congresses and courses, both at the research level and at the teaching and knowledge transfer level.

Her research has focused mainly on the field of surgical robotics. In this field, she joined the medical robotics group at the University of Malaga in 2001, with a grant from a research project financed by the Health Research Fund Projects of the Ministry of Health and Consumption and by the Ministry of Education and Science in its Industrial Design and Production section.

In these projects, the candidate has participated as a collaborating researcher and has covered a cycle of applied research and transfer to industry through various research projects. In this way, the surgical robotics line has produced scientific results published in impact journals and invention patents that have constituted the fundamental pillar for carrying out the transfer. This activity in numbers can be summarized as follows: it has collaborated in 10 research projects in public calls. As a result of this activity, 14 journals, 19 international conferences, 23 national conferences. This knowledge has also led to 10 technology transfer contracts. The research carried out is protected by three patents. The valuation of the research and transfer developed is given by two evaluation of the research activity (six-year period), a SPIN-OFF award from the University of Malaga and a Día de Andalucía award.

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

### **C.1. Publications** (see instructions)

- Muñoz, V.F.; Garcia-Morales, I.; Fraile-Marinero, J.C.; Perez-Turiel, J.; Muñoz-Garcia, A.; Bauzano, E.; Rivas-Blanco, I.; Sabater-Navarro, J.M.; Fuente, E.d.I. Collaborative Robotic Assistant Platform for Endonasal Surgery: Preliminary In-Vitro Trials. *Sensors* 2021, 21, 2320. DOI: 10.3390/s21072320.
- I. Rivas-Blanco, C. J. Pérez-Del-Pulgar, I. García-Morales and V. F. Muñoz, "A Review on Deep Learning in Minimally Invasive Surgery," in *IEEE Access*, 2021. DOI: 10.1109/ACCESS.2021.3068852
- V. Arevalo, J.M. Vicente-del-Rey, I. Garcia-Morales, I. Rivas-Blanco Minivideos tutoriales como apoyo al aprendizaje de conceptos básicos para un curso de Fundamentos de Control Automático". *Revista Iberoamericana de Automática e Informática industrial* 17, 107-115, 2020. DOI: <https://doi.org/10.4995/riai.2020.12156>.
- C.J. Perez del Pulgar, I. Garcia-Morales, I. Rivas Blanco, V.F. Munoz. "Navigation Method for Teleoperated Single-Port Access Surgery with Soft Tissue Interaction Detection". *IEEE Systems Journal*, Vol 12, No. 2, pp 1381-1392, Junio 2018. ISSN: 1937-9234. DOI: 10.1109/JSYST.2016.2570118.
- I. Rivas Blanco, E. Sanchez-de-Badajoz, I. Garcia-Morales, J.M. Lage-Sanchez, P. Sánchez-Gallegos, C.J. Perez-del-Pulgar, V.F. Muñoz. "Global vision system in laparoscopy". *Actas Urológicas Españolas*. Vol. 41, No. 4, pp 274-278, Mayo 2017. ISSN: 0210-4806. DOI: 10.1016/j.acuroe.2017.03.007.
- E. Bauzano-Núñez; M.B. Estebanez-Campos; I. Garcia-Morales; V.F. Muñoz-Martínez. "Collaborative Human-Robot System for HALS Suture Procedures". *IEEE Systems Journal Special Issue on Systems-related topics in Robotics & Automation for human health*. Vol. 10, No. 3, pp 957-966, septiembre 2016. DOI: 10.1109/JSYST.2014.2299559.
- E. Bauzano, P. delSaz-Orozco, I. Garcia-Morales, V.F. Muñoz. "A minimally invasive surgery robotic assistant for HALS–SILS techniques". *International Journal on Computer Methods and Programs in Biomedicine*, vol. 112, pp. 272-283. Nov. 2013. DOI: 10.1016/j.cmpb.2013.01.017.
- B. Estebanez, P. del Saz-Orozco, I. García-Morales, V.F. Muñoz. "Interfaz Multimodal para un Asistente Robótico Quirúrgico: Uso de Reconocimiento de Maniobras Quirúrgicas". *Revista*



Iberoamericana de Automática e Informática Industrial, vol. 8, pp. 24-34. Comité Español de Automática. ISSN: 1697-7912. Abril, 2011.

- E. Bauzano-Núñez, V.F. Muñoz-Martínez, I. García-Morales. "Auto-guided movements on minimally invasive surgery for surgeon assistance". IEEE/RSJ International Conference on Robots and Systems (IROS 2010), pp. 1843-1848. ISBN: 978-1-4244-6676-4. Taipei, Taiwan. Octubre 2010.

- E. Bauzano-Núñez, V.F. Muñoz-Martínez, I. García-Morales, M.B. Estebanez-Campos. "Three-Layer Control for Active Wrists in Robotized Laparoscopic Surgery". IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2009), pp. 2653-2658. ISBN: 978-1-4244-3804-4. St. Louis, Missouri, Estados Unidos. Octubre 2009.

- V. F. Muñoz, I. García-Morales, C. Pérez, J. Gomez de Gabriel, J. F. Lozano, A. García-Cerezo, C. Vara, R. Toscano. "Control movement scheme based on manipulability concept for a surgical robotic assistant". IEEE International Conference on Robotics and Automation, Orlando (USA), 2006.

- V.F. Muñoz, I. García Morales, C. Pérez del Pulgar, J.M. Gómez-de-Gabriel, J. Fernández-Lozano, A. García-Cerezo, C. Vara, R. Toscano "Control Cartesiano de un Asistente Robótico para Cirugía Laparoscópica". Revista Iberoamericana de Automática e Informática Industrial. Volumen: 3, pp. 63-74. Octubre, 2006. ISSN 1697-7912

- V.F. Muñoz, J.M. Gómez-de-Gabriel, I. García-Morales, J. Fernández-Lozano, J. Morales "Pivoting motion control for a laparoscopic assistant robot and human clinical trials". Advanced Robotics. Volumen:19, pp 695-713, 2005. ISSN 0169-1864

**C.2. Congress**, indicating the modality of their participation (invited conference, oral presentation, poster)

**C.3. Research projects**, indicating your personal contribution. In the case of young researchers, indicate lines of research for which they have been responsible.

- TED2021-129893B-I00. Task planner with learning capabilities for human-robot collaboration in a cyber-physical industrial system. Ministerio de Ciencia e Innovación. Convocatoria 2021 de proyectos estratégicos orientados a la transición ecológica y a la transición digital. Main Researcher: Víctor F. Muñoz Martínez. Funding: 135.900,00€. Role: Researcher.

- PID2019-111023RB-C31 "Planificador global de un sistema robótico para anastomosis" Ministerio de Ciencia e Innovación, 01/01/2020-31/12/2022. Universidad de Málaga, Universidad Miguel Hernández y Universidad de Valladolid. Main Researcher: Víctor F. Muñoz Martínez (Universidad de Málaga). Funding: 101.640 €. Role: Researcher.

- DPI2016-80391-C3-1-R "Sistema robótico colaborativo para la corrección del brain-shift en aplicaciones de neurocirugía endoscópica endonasal" MINECO, 2017-2019. Universidad de Málaga, Universidad Miguel Hernández y Universidad de Valladolid. Main Researcher: Víctor F. Muñoz Martínez (Universidad de Málaga). Funding: 220.220€. Role: Researcher.

-DPI2013-47196-C3-1-R "ROBOTIZED HALS". Robot colaborativo para cirugía laparoscópica asistida por la mano. MINECO, 2014-2016 Universidad de Málaga, Universidad Miguel Hernández y Universidad de Valladolid. Main Researcher: Víctor F. Muñoz Martínez (Universidad de Málaga). Funding: 140.000€. Role: Researcher.

- GLORIA: Global Robotic telescope Intelligent Array. Seventh Framework Programme: FP7-INFRASTRUCTURES-2011-2. GA: 283783. Consorcio 13 participantes, 2011-2014. Coordinator: Francisco M. Sánchez Moreno (Universidad Politécnica de Madrid). Funding: 318,221.00. Role: Researcher.

- Plataforma Robotizada Para La Asistencia En Técnicas Notes/Sils. CICYT. Ministerio de Innovación y Ciencia (DPI2010-21126-C03-01), 2011-2013. Universidad de Málaga, Universidad Miguel Hernández e Instituto CARTIF. Main Researcher: Víctor F. Muñoz Martínez (Universidad de Málaga). Funding: 326.700 €. Role: Researcher.

- P07-TEP-2897. Robot autónomo para cirugía mínimamente invasiva. Consejería de Innovación, Ciencia y Empresa. Junta de Andalucía, 2007-2011. Main Researcher: Víctor F. Muñoz Martínez (Universidad de Málaga). Funding: 379.618€. Role: Researcher.

- DPI2007-62257. Robot quirúrgico autoguiado para cirugía mínimamente invasiva en solitario. CICYT. Ministerio de Educación y Ciencia, 2007-2010 Main Researcher: Víctor F. Muñoz Martínez (Universidad de Málaga). Funding: 218.000€. Role: Researcher.



- PI-021708. Sistema robótico modular para cirugía mínimamente invasiva. Instituto de Salud Carlos III. Ministerio de Sanidad y Consumo, 2003-2006. Main Researcher: Víctor F. Muñoz Martínez (Universidad de Málaga). Funding: 112.355€. Role: Researcher.

**C.4. Contracts, technological or transfer merits**, Include patents and other industrial or intellectual property activities (contracts, licenses, agreements, etc.) in which you have collaborated. Indicate: a) the order of signature of authors; b) reference; c) title; d) priority countries; e) date; f) Entity and companies that exploit the patent or similar information, if any

#### **Contracts**

- Development of the surgical robot BROCA. Fondo Europeo de Desarrollo Regional (FEDER), Hospital Reina Sofía, Universidad de Córdoba, Tecnalía y Universidad de Málaga. 2013-2015. Researcher of the University of Malaga. Funding: 391.222€.
- Sistema de emergencias extra hospitalaria. Contract between ITURRI S.A. and Universidad de Málaga, 2008-2009. Role: Researcher. Funding: 55.000€.
- Diseño y desarrollo de la electrónica y de su sistema de control de la cama para prevención de úlceras por presión (patent P200502159). Contract OTRI number: 8.06/5.56.2797. Contract between INDUVAR S.A. and Universidad de Málaga, 2006-2007. Role: Researcher.
- Contract between SENER S.A and Universidad de Málaga for the exploitation of the patents related to the cameraman assistant robot, 2007. Role: Researcher.
- Study to evaluate de feasibility of the surgical system developed by the research group. Contract between SENER S.A. and the Universidad de Málaga, 2006.

#### **Patents**

- I. Rivas Blanco, V.F. Muñoz Martínez, P. del Saz Orozco Huang, I. García Morales, M. Cuevas Rodríguez, B. Estebanez Campos, E. Bauzano Núñez. "Sistema robótico de asistencia a la cirugía mínimamente invasiva de puerto único con mecanismo de orientación activa capaz de acomodar su movimiento a la anatomía de la pared abdominal". Número de patente: ES2547030B2. Entidad titular: Universidad de Málaga.
- J. C. Álvarez Cortes, P. L. Garrido Cano, I. García Morales, C. Quero González, V.F. Muñoz Martínez, M. R. Medina del Pozo, I. Pérez Irialte, I. Trujillo Liñán. "Sistema de seguridad para el control de uso de equipos de protección laboral individual". Número de patente: ES2334314B1. Entidad titular: Universidad de Málaga. Licenciada a la empresa UMA-TECNOLEX SL entre el 27 de marzo de 2012 y octubre de 2014.
- V.F. Muñoz, I. García Morales, J. Fdez Lozano, J. Gómez de Gabriel, A. García Cerezo, C. Pérez del Pulgar, J. Serón Barba, F. Domínguez Fdez, C. Vara Thorbeck, R. Toscano. "Sistema robótico de asistencia a la cirugía mínimamente invasiva capaz de posicionar un instrumento quirúrgico en respuesta a las órdenes de un cirujano sin fijación a la mesa de operaciones ni calibración previa del punto de inserción". Número de patente: ES2298051B2. Entidad titular: Universidad de Málaga. Explotación SENER Ingeniería y Sistemas S.A. entre 20 de diciembre de 2008 y 31 de diciembre de 2012

#### **C.5. Management**

University management from 2008 to 2012 as Director of Transfer and European Research Area, taking charge of the Office for the Transfer of Research Results of the University of Malaga, and of the European Projects Office.

Coordinator of the degree in electronic, robotics and mechatronics engineering at the University of Málaga from June of 2021.