

CURRICULUM VITAE ABREVIADO (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages.

Part A. PERSONAL INFORMATION

First name	José Rafael		
Family name	Rodríguez Galván		
Gender (*)			
Social Security, Passport, ID number			
e-mail	rafael.rodriguez@uca.es		
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-4578-6372		

A.1. Current position

Position	Profesor Titular de Universidad - Full Tenured Lecturer		
Initial date	06/11/2017		
Institution	Universidad de Cádiz		
Department/Center	Matemáticas / Facultad de Ciencias		
Country	Spain		
Key words	Numerical Analysis, Partial Differential Equations, Scientific Computing		

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

Period	Position/Institution/Country/Interruption cause
1/2/2010 - 25/10/2011	Secretary of the Free Software Office of Universidad de Cádiz
11/6/2004 - 31/1/2010	Director of the Free Software Office of Universidad de Cádiz
28/01/1998 - 05/11/2017	University School (Non Full) Tenured Lecturer, Univ. Cádiz
,01/10/1996 - 27/01/1998	Associate Lecturer, Universidad de Cádiz

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Mathematics	Universidad de Sevilla / Spain	2013
Licensed in Mathematics	Universidad de Sevilla / Spain	1993

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

After my degree in Mathematics in 1993, and while I was a PhD student in the **doctorate program** at the “Departamento de Ecuaciones Funcionales y Análisis Numérico” (Universidad de Sevilla), I was hired as an **asociate lecturer** at the Universidad de Cádiz in 1995. In **1998** I appointed to an **associate lecturer** position at this University.

In the subsequent years my research activity was slowed down due to the birth of my two daughters and specially due to the position of responsibility as the **Director of the Free Software Office** of the Universidad de Cádiz that I got in 2004. In fact, I was the person who designed and implemented this office in **2003**, the second one of this type among Spanish universities. This responsibility was perfectly aligned with the interest in scientific computing that I have always held and it helped in deepening my knowledge in UNIX machines and high performance computing. During this time we worked closely together with the computer science and mathematics departments in several Spanish universities and also with institutions and companies like “Junta de Andalucía” or Telefónica. Finally, this experience was extremely enriching, our activities had a great impact in Spain and in some external international universities and it helped me in developing skills as coordinator of work teams, and also in innovation, dissemination and transfer of knowledge.

Over the **2010-2013** period, I put all my efforts into boosting the research activity which I had maintained latent in the background through conferences and proceedings on numerical analysis and scientific computing in the previous years. This effort culminated with a **PhD in Mathematics**, *Universidad de Sevilla*, 2013, entitled *Analysis and Numerical Simulation of Fluids Related to Hydrostatic Approximations*. In it we analyzed and implemented new techniques for the numerical simulation of systems of Partial Differential Equations (PDEs) modeling geophysical fluids arising in global circulation models, in particular in oceans. As a result, we published three papers in Q1 (JCR Mathematics and Applied Mathematics) journals, describing different techniques for the approximation of Stokes and hydrostatic equations using generic non-structured meshes. One of the papers [8] was focused on Stokes equations and aroused interest among the scientific community. Another one [9] is notable for enabling the use of standard classical techniques for Galerkin approximation of hydrostatic equations.

In **2017** I obtained a University Full Tenured position at the Universidad de Cádiz. Around these years I started **exploring other fields** where my previous experience could be applicable. Specifically I became interested in biological PDE models and my lines of research were extended to numerical analysis of **living cell models**, including cross diffusion and conservative laws. A vital step in this direction was to acquire a great deal of experience on **discontinuous Galerkin** methods. As a result, from **2020 to date** we have published seven papers in Q1 (JCR Mathematics and Applied Mathematics) international prestigious journals and also one in Q2. Among these papers we can highlight several contributions to modeling, numerical analysis and computer simulation of chemotaxis systems [3, 4, 7, 8] and phase field equations on tumor growth or fluid [1, 2]. They resulted in the PhD thesis 'Analysis and numerical simulation of tumor growth models' defended by Daniel Acosta Soba in 2024.

On the whole, throughout my research career I specialized in **numerical analysis** and **computer simulation** of mathematical models from science and engineering. I have been part of numerous research **projects** and **contracts**, even in fields not directly connected to my main lines of research. In addition, I have participated as an invited lecturer, as a speaker and as an organizer in numerous national and international conferences, in whose proceedings I have published **dozens** of **articles**. Also I have worked in **disseminating** scientific knowledge as manager of the social networks of the Spanish Society of Applied Mathematics from 2019 and also as editor of the Electronic Bulletin of this society.

Part C. RELEVANT MERITS

C.1. Publications

Papers indexed in Q1 JCR "Mathematics" and "Applied Mathematics" categories

1. Acosta-Soba, D., Guillén-González, F., Rodríguez-Galván, J. R. & J. Wang (2025). Property-preserving numerical approximation of a Cahn–Hilliard–Navier–Stokes model with variable density and degenerate mobility. *Applied Numerical Mathematics*, 209, 68-83
2. Acosta-Soba, D., Guillén-González, F. & Rodríguez-Galván, J. R. (2023). A structure-preserving upwind DG scheme for a degenerate phase-field tumor model. *Computers & Mathematics with Applications*, 152, 317-333.
3. Acosta-Soba, D., Guillén-González, F. & Rodríguez-Galván, J. R. (2023). An Unconditionally Energy Stable and Positive Upwind DG Scheme for the Keller–Segel Model. *Journal of Scientific Computing*, 97(1), 18.
4. Acosta-Soba, D., Guillén-González, F. & Rodríguez-Galván, J. R. (2023). An upwind DG scheme preserving the maximum principle for the convective Cahn–Hilliard model. *Numerical Algorithms*, 92(3), 1589-1619.
5. Guillén-González, F., Redondo-Nebbe, M. V. & Rodríguez-Galván, J. R. (2021). Numerical analysis of a stable discontinuous Galerkin scheme for the hydrostatic Stokes problem. *Journal of Numerical Mathematics*, 29(2), 103-118.

6. Gutiérrez-Santacreu, J. V. & Rodríguez-Galván, J. R. (2021). Analysis of a fully discrete approximation for the classical Keller–Segel model: Lower and a priori bounds. *Computers & Mathematics with Applications*, 85, 69-81.
7. Cabrales, R. C., Gutiérrez-Santacreu, J. V. & Rodríguez-Galván, J. R. (2020). Numerical solution for an aggregation equation with degenerate diffusion. *Applied Mathematics and Computation*, 377, 125145.
8. Guillén-González, F. & Rodríguez-Galván, J. R. (2016). On the stability of approximations for the Stokes problem using different finite element spaces for each component of the velocity. *Applied Numerical Mathematics*, 99, 51-76
9. Guillén-González, F. & Rodríguez-Galván, J. R. (2015). Stabilized schemes for the hydrostatic Stokes equations. *SIAM Journal on Numerical Analysis*, 53(4), 1876-1896.
10. Guillén-González, F. & Rodríguez-Galván, J. R. (2015). Analysis of the hydrostatic Stokes problem and finite-element approximation in unstructured meshes. *Numerische Mathematik*, 130(2), 225-256.

Other indexed papers

11. Frassu, S., Galván, R. R., & Viglialoro, G. (2023, Q2). Uniform in time L^∞ -estimates for an attraction-repulsion chemotaxis model with double saturation. *Discrete and Continuous Dynamical Systems-B*, 28(3), 1886-1904.
12. Amahjour, N., Sofi, A., Rodríguez Galván, J. R., El Kharrim, A., & Khamlichi, A. (2023, Q4). An Evaluation of Inflow Profiles for CFD Modeling of Neutral ABL and Turbulent Airflow over a Hill Model. *Journal of Applied Fluid Mechanics*, 16(8), 1515-1530.

Book chapters with peer review

1. Guillén-González, F., Redondo-Neble, M. V., & Rodríguez-Galván, J. R. (2019). On Stability of Discontinuous Galerkin Approximations to Anisotropic Stokes Equations. In *Recent Advances in Differential Equations and Applications* (pp. 211-228). Springer.

C.2. Conferences

Invited lecturer

1. *A Review of Numerical Methods for Chemotaxis Biological Systems*. Università degli Studi di Cagliari, July 2023.
2. *Galerkin Schemes for Migration Processes in Biology*. University of Tennessee at Chattanooga (EEUU), April 2022
3. *From FEM to DG for migration in biology: a personal voyage*. Universidad de Zaragoza (Spain), July 2022
4. *Partial Differential Equations (PDE) models for ocean modeling*. Mediterranean Symposium on Smart City Applications, Tangier (Morocco), 2017
5. *Aproximación del modelo no reducido de Navier Stokes hidrostático para el océano*. Universidad de Sevilla (Spain), 2012.
6. *Free software in the Spanish university*. Tangier (Morocco), 2010.
7. *Introducción general al software libre*. Jornada de difusión de software libre orientado a la ciencia e ingeniería. Universidade da Coruña (Spain), 2009.

Organization of international conferences

1. II Joint Meeting Spain-Brazil in Mathematics, RSME-SEMA-SBM-SBMAC. Cádiz, 11-14 December 2018.
2. XXIV Congress on Differential Equations and Applications / XIV Congress on Applied Mathematics (XXIV CEDYA / XIV CMA). Cádiz, 8-12 June 2015.
3. Cádiz Numérica 2013, Numerical Analysis Course and Meeting, Puerto Real (Cádiz), 2013.
4. Free Libre Open Source Systems International Conference. Cádiz 2007.
5. XI Jacques-Louis Lions Hispano-French School on Numerical Simulation in Physical and Engineering, Cádiz, 2004

Oral presentations in international conferences (restricted to last 10 years)

1. *Machine learning techniques for inverse problems on brain cell migration in neurogenesis*. Ortega Román, N.; Rodríguez Galván, J. R. XXVIII CEDYA / XVIII CMA, Bilbao, 2024.
2. *Upwind DG property-preserving schemes for convection equations: application to Cahn-Hilliard model*. Acosta Soba, D.; Guillén González, F.; Rodríguez Galván, J. R. FeniCS 2024 conference. Norway, 12-14 June 2024
3. *Energy stable and positive DG schemes for Keller-Segel equations*. Acosta Soba, D.; Guillén González, F.; Rodríguez Galván, J. R. 10th ICIAM, Tokyo (Japan), 2023.
4. *Time parallel methods for epidemiological models*. Ortega Román, N.; Redondo Neble, M.V.; Rodríguez Galván, J.R.. XXVII CEDYA / XVII CMA, Zaragoza, 2022.
5. *Numerical schemes for attraction-repulsion chemotaxis systems*. Frassu, S; Rodríguez-Galván, J.R.; Viglialoro, G. XXVII CEDYA / XVII CMA, Zaragoza, 2022.
6. *Flux-corrected methods for chemotaxis equations*. Navarro Izquierdo A.M., Redondo Neble M.V.; Rodríguez Galván, J.R.. XXVI CEDYA / XVI CMA, Gijón, 2021.
7. *On stability of Discontinuous Galerkin Approximations to Anisotropic Stokes Equations*. Guillén-González, F.; Redondo-Neble M.V, Rodríguez-Galván, J.R..XXIII CEDYA / XIII CMA, Cartagena, 2017.
8. *Stabilizing the Hydrostatic Stokes Equations*. Guillén-González, F.; Rodríguez-Galván, J.R.. XXIV CEDYA / XIV CMA, U. Cádiz, 2015.
9. *Time-Splitting Schemes for Hydrostatic Navier-Stokes Equations*. Guillén-González, F.; Rodríguez-Galván, J.R.. XXIII CEDYA / XIII CMA, U. Castellón, 2013.
10. *New techniques for the numerical approximation of the Primitive Equations of the ocean*. Guillén-González, F.; Rodríguez-Galván, J.R.. Numerical Modelling in Environment and Natural Resources (U. Granada, 2013).

C.3. Research projects (restricted to last 10 years)

1. Title: "Investigación de una Plataforma inteligente de mantenimiento predictivo de infraestructuras". Reference: AEI-010500-2021b-128. Funding entity: Ministerio de Industria, Comercio y Turismo. PI: Jesús Medina Moreno (Univ. Cádiz). Duration: 19/11/2021 to 21/8/2022. Grant: 87,262€. Participation as: researcher.
Personal contribution: software development and computational data analysis
2. Title: "Optimización de rutas marítimas con información oceanográfica y meteorológica en tiempo real". Reference: TED2021-129455B-I00. Funding entity: Ministerio de Ciencia e Innovación. PI: David Gómez Ullate. Duration: 19/11/2021 to 21/8/2022. Grant: 150.000€. Participation as: researcher.
Personal contribution: comparative analysis of mathematical models of ship engines fuel consumption
3. Title: "Nuevos retos en el estudio de procesos biológicos mediante Ecuaciones en Derivadas Parciales". Reference: P20_0112. Funding entity: Junta de Andalucía. PI: Francisco Guillén González (Univ. Sevilla). Duration: 05/10/2021 to 31/12/2022. Participation as: researcher.
Personal contribution: responsible of the development of a preliminary PDE model of neural cells chemoattraction
4. Title: "Modelos biológicos con Quimiotaxis y Efectos no Locales". Reference: PGC2018-098308-B-I00. Funding entity: Ministerio de Ciencia, Innovación y Universidades. PI: Francisco Guillén González and Antonio Suárez Fernández. Duration: 01-01-2019 to 31-12-2022. Grant: 76.000€. Participation as: researcher.
Personal contribution: responsible of the introduction of discontinuous Galerkin methods for numerical approximation of chemotaxis models
5. Title: "HARMONIC: Herramientas formales difusas para Razonamiento No canónico". Funds: Ministerio de Economía y Competitividad. PI: J. Medina Moreno (Univ. Cádiz). Grant: 51.909€. Duration: 2016-2019. Participation as: researcher.
Personal contribution: Development of software tools on the topic of the project.
6. Title: "Razonamiento formal para problemas de sostenibilidad". - 01 February 2013 to 31 December 2015. PI: Jesús Medina Moreno (Univ. Cádiz). Grant: 38.580€. Duration: 2016-2019. Participation as: researcher.
Personal contribution: Python programming library related to fuzzy FCA.
7. Title: "Campo de Fases y Aplicaciones; Multifluidos, Solidificación y Tumores". Funding entity: Ministerio de Economía y Competitividad. Grant: 36.000€. PI: F. Guillén González. Duration: 01/01/2013 to 31/12/2015. Participation as: researcher.
Personal contribution: Analysis of tumor models based on phase fields PDE equations and development of numerical schemes for computer implementation

C.4. Contracts, technological or transfer merits

1. Contract: "Taxonomía de estándares abiertos informáticos". Funding entity: Telefónica Soluciones S. A. U. **PI: J. Rafael Rodríguez Galván**. Participants: J. R. Rodríguez Galván, M. Palomo Duarte, G. Aburruzaga Sánchez, J. C. González Cerezo, A. García Domínguez, A. Álvarez Ayllón. Duration: 18/9/2006 to 18/11/2006. Targets: 1) exploring and classifying formats protocols and interfaces in TICs which could be parametrized through their technical specifications and be susceptible of standardization and normalization. 2) Study of the previous subjects and analysis of their suitability as open standards