# Curriculum vitae
## Sonia Fernández-Méndez

## Personal Data

Citizenship: spanish e-mail: sonia.fernandez@upc.edu
Date of birth: March 3, 1974
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Web of Science Researcher ID: G-8238-2011 Scopus ID: 6506239863
Current position: Full Professor (Catedrática de Universidad) at departament d'Enginyeria Civil i Ambiental (DECA), Universitat Politècnica de Catalunya

## Education

- Ph.D. in Applied Mathematics at Universitat Politècnica de Catalunya, November 2001.
- Degree in Mathematics at Universitat Politècnica de Catalunya, June 1996.

## Research interests

Computational Mechanics, with special interest in Advanced Discretization Techniques (high-order finite element computations, Discontinuous Galerkin methods, eXtended finite elements, numerical solution of 4th order PDEs) and applications (electroactive materials, crack propagation, bubble formation and dynamics, etc)

## Awards

- *Jacques Louis Lions Award 2010 for Young Scientistis in the field of Computational Mathematics*, by European Community on Computational Methods in Applied Sciences (ECCOMAS), June 2010
- *Juan Carlos Simó award 2009* for young scientist in the field of Computational Mechanics, by Sociedad Española de Métodos Numéricos en Ingenieria (SEMNI), June 2009.

## Papers in indexed journals

| Journal | #papers | Impact Factor JCR 2022 |
|---|---|---|
| International Journal for Numerical Methods in Engineering | 9 | 2.9 Q1 |
| International Journal for Numerical Methods in Fluids | 6 | 1.8 Q2 |
| Journal of Scientific Computing | 5 | 2.5 Q1 |
| Computer Methods in Applied Mechanics and Engineering | 4 | 7.2 Q1 |
| Archives of Computational Methods in Engineering | 1 | 9.7 Q1 |
| other | 13 | |

total: **38** papers H-index: **20** Sum of the times cited: **1607**

1. A. Huerta and S. Fernández-Méndez, "Enrichment and coupling of the finite element and meshless methods", International Journal for Numerical Methods in Engineering (2000)
   Times cited WoK: **153**
   …
6. S. Fernández-Méndez and A. Huerta, "Imposing essential boundary conditions in mesh-free methods", Computer Methods in Applied Mechanics and Engineering (2004)
   Times cited WoK: **342**
   …

10. R. Sevilla, S. Fernández-Méndez and A. Huerta, “NURBS-enhanced finite element method (NEFEM)”, International Journal For Numerical Methods in Engineering (2008)
    Times cited WoK: **165**
    …
31. Muixí, A.; Fernandez-Mendez, S.; Rodriguez-Ferran, A. “Adaptive refinement for phase-field models of brittle fracture based on Nitsche's method”, Computational Mechanics (2020)
    Times cited WoK: **56**
32. Muixí, A.; Marco, O.; Rodriguez-Ferran, A.; Fernandez-Mendez, S. “A combined XFEM phase-field computational model for crack growth without remeshing”, Computational Mechanics (2021)
33. Ventura, J.; Codony, D.; Fernandez-Mendez, S. “A C0 interior penalty finite element method for flexoelectricity”, Journal of Scientific Computing (2021)
34. Barceló-Mercader, J.; Codony, D.; Fernández-Méndez, S. and Arias, I. “Weak enforcement of interface continuity and generalized periodicity in high-order electromechanical problems“, International Journal for Numerical Methods in Engineering (2022)
35. Balcells, O.; Codony, D. and Fernández-Méndez, S. “C0-IPM with generalised periodicity and application to flexoelectricity-based 2D metamaterials”, Journal of Scientific Computing (2022)
36. Greco, F.; Codony, D.; Mohammadi, H., Fernández-Méndez, S. and Arias, I. “Topology optimization of flexoelectric metamaterials with apparent piezoelectricity”, Journal of the Mechanics and Physics of Solids (2024)
37. Pérez-Escudero, S.; Codony, D.; Arias, I.; Fernández-Méndez, S. “A comparison of formulations and non-linear solvers for computational modelling of semiconductor devices”, Computational Mechanics (2025)
38. Pérez-Escudero, S; Fernández-Méndez, S. “A C0 Interior Penalty Finite Element method for flexoelectricity at finite deformations”, Computer Methods in Applied Mechanics and Engineering (2025)

## PhD advisoring

1. Rubén Sevilla, “NURBS-Enhanced Finite Element Method (NEFEM)”, UPC, June 2009. Advisors: S. Fernández-Méndez and A. Huerta.
2. Adeline de Montlaur, “High-order Discontinuous Galerkin methods for incompressible flows”, UPC, September 2009. Advisors: S. Fernández-Méndez and A. Huerta.
3. Giorgio Giorgiani, “Adaptive hybrid discontinuous methods for fluid and wave problems”, UPC, April 2013. Advisors: S. Fernández-Méndez and A. Huerta.
4. Mostafa Javadzadeh Moghtader, “High-Order Hybridizable Discontinuous Galerkin Method for Viscous Compressible Flows”, UPC, November 2016. Advisor: S. Fernández-Méndez
5. Mahendra Paipuri, “Comparison and coupling of continuous and hybridizable discontinuous Galerkin methods: Application to multi-physics problems”, March 2018. Advisors: C. Tiago (Instituto Superior Technico), S. Fernández-Méndez
6. Ceren Gürkan, “eXtended hybridizable discontinuous Galerkin method”, November 2018. Advisors: S. Fernández-Méndez and M. Kronbichler (Technical University of Munich)
7. Alba Muixí, “Locally adaptive phase-field models and transition to fracture”, September 2020. Advisors: S. Fernández-Méndez and A. Rodríguez-Ferran.
8. Sergi Pérez-Escudero, “Finite Element computational modeling of flexoelectricity and flexo-photovoltaics”, July 2025. Advisors: S. Fernández-Méndez and I. Arias.

## Other relevant information

- 4 recognised reseach periods (sexenios), the last one for the period 2016-2021.
- Participation in 27 research projects, 3 funded by the EC. PI in the project DAFOH2 and IP2 in the project flexoPVComp, Spanish ministry.
- Director of the Master in Advanced Mathematics and Mathematical Engineering (MAMME), coordinator of the PhD program in Applied Mathematics at UPC, from March 2014 to March 2019.
- Secretary of the department of Civil and Environmental Engineering, since May 2019.
- Referee for JCR indexed journals: *International Journal for Numerical Methods in Engineering*, *Computer Methods in Applied Mechanics and Engineering, Finite Elements in Analysis and Design, Journal of Scientific Computing,…*