CURRICULUM VITAE - Prof. Antonio J. Gil, ICCP, CAS, PhD, SFHEA

Personal details

Zienkiewicz Institute for Modelling, Data and AI
Faculty of Science and Engineering
Swansea University
Fabian Way, Swansea
SA1 8EN, United Kingdom

Phone: +44 (0) 1792 602552

e-mail: a.j.gil@swansea.ac.uk

http://www.swan.ac.uk/staff/academic/Engineering/gilantonio/

Current position

- **Head of the School of Aerospace, Civil, Electrical, General and Mechanical Engineering**, Swansea University, U.K., since April 2021.
- **Full Professor (Personal Chair)**, Swansea University, U.K., since March 2017.
- **Honorary Professor** in the School of Computer Science and Mathematics, Keele University, U.K., since May 2021.
- **Chartered Civil Engineer** in the Spanish Institution for Civil Engineers, since October 1999.
- Programme Director of Erasmus Mundus Joint Doctorate "*Simulation in Engineering and Entrepreneurship Development*", Swansea, since September 2012.
- Deputy Programme Director of Erasmus Mundus Masters Course "*Computational Mechanics*", Swansea, since February 2008.

Academic qualifications

- **Senior Fellow** of the **Higher Education Academy (SFHEA)**, since June 2016.
- **Doctor in Philosophy (PhD)** degree awarded by Swansea University in January 2005, with the thesis entitled "*Structural analysis of prestressed Saint Venant-Kirchhoff hyperelastic membranes*".
- **Postgraduate Certificate of Advanced Studies (CAS)**, equivalent to a two-year MSc. Years 1999-2001. Awarded after completion of the two-year Postgraduate program in the Departments of Civil Engineering and Mechanics of Structures and Continuum at the University of Granada (Spain), with the thesis entitled: "*Metodos numéricos para el diseño de estructuras traccionadas: membranas y redes de cables*"–"Numerical methods for the design of prestressed structures: membranes and cable networks".
- Academic year at the University of Davis (California, U.S.A.), (1998-1999) under a full scholarship awarded by the University of California Education Abroad Program.
- Undergraduate Degree of **Ingeniero de Caminos, Canales y Puertos (ICCP)**, MEng Civil Engineering equivalent, awarded by the University of Granada (Spain). Years 1994-1999.

Academic career

- [*March 2017 -*] **Full Professor** in the College of Engineering, Swansea University, U.K.
- [*May 2013 - February 2017*] **Associate Professor** in the College of Engineering, Swansea University, U.K.

- [*Oct 2010 - April 2013*] **University Senior Lecturer** in the College of Engineering, Swansea University, U.K.
- [*Aug 2006 - Sept 2010*] **University Lecturer** in the School of Engineering, Swansea University, U.K.
- [*Oct 2003 - Jul 2006*] **Senior Research Assistant** at the Civil and Computational Engineering Centre, Swansea University, investigating on the topic "*Fluid structure interaction for medical applications*".
- [*Jan 2003-Sept 2003*] **Research Assistant** at the Civil and Computational Engineering Centre, Swansea University, investigating on the topic "*Numerical simulation of superplastic forming of dental and medical prostheses*". This research was undertaken in collaboration with medical institutions, including Guy's, Kings College and St Thomas's Hospitals Dental School (GKT) in London.

Teaching experience

- Recipient of the **Swansea University Teaching Excellence Award 2019**.
- Finalist in the Swansea University Teaching Excellence Award 2012.
- [*2005 - 2006*] EG-399 Engineering Analysis III (10 UK credits).
- [*2006 - 2011*] EG-163 Civil Engineering Laboratory (10 UK credits).
- [*2006 - 2011*] EG-225 Structural Mechanics IIb (10 UK credits).
- [*2006 - 2011*] EGA206 Aerospace Structural Mechanics and Materials (10 UK credits).
- [*2006 - present*] EG-321 Geomechanics (10 UK credits).
- [*2007 - 2020*] EGIM05 Nonlinear Continuum Mechanics (10 UK credits).
- [*2020 - 2021*] EG-222 Reinforced Concrete Design (10 UK credits).

Refereed journal papers and chapters in books

- **Total number of publications**: 236
- Google Scholar Page **H-index: 30**
- Scopus **H-index: 25**
- ORCID
- Researcher ID Page **H-index: 24**
- Research Gate Page
- Peer reviewed Q1 **indexed journals**: 79 (+4 under review) [$\approx$ 4.5 per year since first publication].
- **Invited chapters** in books: 4.
- **Books**: 3.
- **Refereed** international **conference papers**: 153.

Research interests

- Computational simulation of nonlinear architectural and biomedical membranes.
- Computational analysis of superplastic forming techniques for medical applications.
- Numerical analysis of turbulent incompressible fluids with moving boundaries.
- Numerical analysis of fluid structure interaction phenomena for applications in biomedical engineering.

- Immersed methods for fluid-structure interaction and haemodynamic applications.
- Solid and Electromagnetics coupling simulations.
- Fast Dynamics under Conservation Law formulations.
- Reduced order modelling and Machine Learning.

Honours and awards

- Doctoral Supervisor of the PhD thesis "*A New Updated Reference Lagrangian Smooth Particle Hydrodynamics Framework for Large Strain Solid Dynamics and its Extension to Dynamic Fracture*" by Dr. P. Refachinho de Campos, which was awarded the 2023 School of Aerospace, Civil, Electrical, General and Mechanical Engineering award for the best PhD thesis
- **Best presentation award** in the 4$^{\text{th}}$ International SPHERIC workshop (October 2022) for the presentation entitled "Entropy-stable Smooth Particle Hydrodynamics for large strain solid dynamics using first order conservation laws".
- Doctoral Co-supervisor of the PhD thesis "*3D Simulation of Magneto-Mechanical Coupling in MRI Scanners Using High Order FEM and POD*" by Dr. M. Seoane, which was awarded the **best 2020 PhD thesis** in the Zienkiewicz Centre for Computational Engineering.
- Recipient of the **Swansea University Teaching Excellence award 2019**.
- Doctoral Co-supervisor of the PhD thesis "*A high order Finite Element coupled Multi-Physics approach to MRI scanner design*" by Dr. S. Bagwell, which was awarded the **best 2018 PhD thesis** in the Zienkiewicz Centre for Computational Engineering.
- Doctoral Supervisor of the PhD thesis "*On a new variational and computational framework for polyconvex nonlinear continuum mechanics and convex multi-variable nonlinear electro-elasticity*" by Dr. R. Ortigosa, which was awarded the UK Association of Computational Mechanics **(UK-ACM) Zienkiewicz price** for the best PhD thesis in the field of Computational mechanics in the UK during 2016 and the **ECCOMAS prize** for the best PhD thesis in the field of Computational mechanics in Europe during 2016.
- Co-author in J. Haider, C.H. Lee, A.J. Gil, J. Bonet and A. Huerta, "Large strain solid dynamics in OpenFOAM", awarded **Student Best Research Paper Award** of the 4$^{\text{th}}$ OpenFOAM User Conference 2016, Cologne (Germany).
- **The O.C. Zienkiewicz Prize**, awarded in May 2016 by the European Community on Computational Methods in Applied Sciences (ECCOMAS), for my contributions as young investigator to the field of computational mechanics.
- Doctoral co-supervisor of the PhD thesis "*An hp-Finite Element computational framework for nonlinear magneto-fluid problems including magnetostriction*" by Dr. D. Jin, which was awarded the **best 2016 PhD thesis** in the Zienkiewicz Centre for Computational Engineering.
- Co-author in K. Izian, C.H. Lee, A.J. Gil and J. Bonet, "A Two-Step Taylor-Galerkin method for explicit solid dynamics", *Engineering Computations*, Volume 31, Issue 3, pages 366-387, 2014, awarded **2015 Outstanding paper of the year** Emerald Award of Excellence.
- Co-author in R. Ortigosa, A.J. Gil and J. Bonet, "A variational framework for large strain polyconvex dielectric elastomers", awarded **SIAM prize** for the **Best Postgraduate Research Paper** of the 23$^{\text{rd}}$ UK Association of Computational Mechanics in Engineering (ACME) Conference, 2015.
- Co-author in C.H. Lee, A.J. Gil, J. Bonet and R. Ortigosa, "An entropy-based stabilised Petrov-Galerkin formulation for linear tetrahedral elements in compressible, nearly incompressible and truly incompressible isothermal fast dynamics", awarded **Best Postdoctoral Research Paper** of the 23$^{\text{rd}}$ UK Association of Computational Mechanics in Engineering (ACME) Conference, 2015.

- Doctoral Supervisor of the PhD thesis "*A vertex centred Finite Volume Method for solid dynamics*" by Dr. M. Aguirre, which was awarded the **best 2014 PhD thesis** in the Zienkiewicz Centre for Computational Engineering.
- **The Philip Leverhulme Prize**, awarded in November 2011 by the The Philip Leverhulme Trust Foundation, for my contributions as young investigator to the field of computational mechanics in the United Kingdom http://www.leverhulme.ac.uk.
- Participant in the prestigious **First Welsh Crucible 2011** http://www.welshcrucible.org.uk/.
- Doctoral Supervisor of the PhD thesis "*Development of a cell centred upwind finite volume algorithm for a new conservation law formulation in structural dynamics*" by Dr. C. H. Lee, which was awarded the UK Association of Computational Mechanics in Engineering **(ACME) Zienkiewicz price** for the best PhD thesis in the field of Computational mechanics in the UK during 2012.
- Co-author in C.H. Lee, A.J. Gil and J. Bonet, "Development of a finite volume algorithm for a new conservation law formulation in structural dynamics", awarded **Best Postgraduate Research Paper** of the 19$^{\text{th}}$ UK Association of Computational Mechanics in Engineering (ACME) Conference, 2011.
- Co-author in C. Wood, A.J. Gil, O. Hassan and J. Bonet, "A Partitioned Approach for the Solution of Three-Dimensional Time-Dependent Incompressible Fluid-Structure Interaction", awarded **Best postgraduate Research Paper** of the 15$^{\text{th}}$ UK Association of Computational Mechanics in Engineering (ACME) Conference, 2007.
- Leading author in A.J. Gil, "Structural analysis of cable and strut supported pre-stressed membranes", awarded **Best Postgraduate Research Paper** of the 12$^{\text{th}}$ UK Association of Computational Mechanics in Engineering (ACME) Conference, Cardiff, 5-6 April 2004.
- **Honorary Mention** to the Hangai Medal in "Shell and Spatial structures: from models to realization", IASS, September 2004, Montpellier (France), with the paper "*Wrinkling analysis of prestressed hyperelastic Saint Venant-Kirchhoff membranes*".
- **National 1$^{\text{st}}$ Prize** awarded by the Education, Culture and Sport Ministry of Spain for the Undergraduate Degree of Ingeniero de Caminos, Canales y Puertos, throughout the years 1994-1999.
- **University 1$^{\text{st}}$ Prize** awarded by the University of Granada (Spain) for the Undergraduate Degree of Ingeniero de Caminos, Canales y Puertos, throughout the years 1994-1999.
- Full Postgraduate Scholarship awarded by the Education, Culture and Sport Ministry of Spain (of one scholarship awarded to the School of Engineering, University of Granada), years 1999-2002.

Doctoral and Postdoctoral Research supervision

- **Past and current Research Assistants**

2018-2023 **Mr. Thomas di Giusto**.
2018-2021 **Dr. Paulo Roberto Refaninho de Campos**.
2019-2021 **Dr. Francisco Marín**
2016-2019 **Dr. Ataollah Ghavamian**.
2016-2019 **Dr. Guillem Barroso**.
2014-2018 **Dr. Jibran Haider**.
2015-2018 **Dr. Ossama Ibrahim**.
2015-2018 **Dr. Rogelio Ortigosa Martínez**.
2013-2016 **Dr. Roman Poya**.
2010-2013 **Dr. Miquel Aguirre Font**.

2008-2013 **Dr. Aurelio Arranz Carreño**.

- Past and current doctoral students

2023-present To be appointed, PhD (1st supervisor), (funded by EPSRC-DSTL).

2023-present To be appointed, PhD (1st supervisor), (funded by DSTL).

2023-present To be appointed, PhD (1st supervisor), (funded by AWE).

2021-present **Mr. Yashwanth Sooriyakanthan**, PhD (1st supervisor), "*Computational simulation of floor borne vibrations in MRI scanners*"

2021-present **Mr. Nathan Ellmer** , PhD (1st supervisor), "*Accelerated in-silico simulation of Electro-Active Polymers in soft robotics*"

2021-present **Mr. Mohammed Sayed Miah**, PhD (external supervisor at Keele University in collaboration with Dr. P. D. Ledger), "*Data-driven for in-service modelling of MRI scanners*"

2021-present **Ms. Daniela Segura**, PhD (1st supervisor), "*Data-driven modelling of thermally coupled fluids and hydraulic efficiency optimisation in pipe flows*"

2019-present **Mr. Callum Jones**, EngD (1st supervisor), "*Computational simulation of a novel thermowell design for industrial applications*"

2018-present **Mr. Thomas di Giusto**, PhD (1st supervisor), "*A new computational tool for multi-material solid dynamics*"

2016-present **Mr. Matthew Kear**, EngD (1st supervisor), "*A high accurate coupled acoustic methodology for pressure reducers*"

2018-2023 **Dr. Paulo Roberto Refachinho de Campos**, PhD (1st supervisor), "*A New Updated Reference Lagrangian Smooth Particle Hydrodynamics Framework for Large Strain Solid Dynamics and its Extension to Dynamic Fracture*"

2017-2021 **Dr. Kayalvizhi Lakshmanan** , PhD (co-supervisor), "*Development of Machine Learning algorithms for predictive maintenance in centrifugal pumps*"

2016-2020 **Dr. Guillem Barroso**, PhD (1st supervisor), "*Towards MRI scanner design: the Proper Generalised Decomposition method in the context of coupled magneto-mechanical problems*"

2016-2020 **Dr. Marcos Seoane**, PhD (2nd supervisor), "*3D Simulation of Magneto-Mechanical Coupling in MRI Scanners Using High Order FEM and POD*"

2016-2020 **Dr. Ataollah Ghavamian**, PhD (1st supervisor), "*A Computational Framework for a first-order system of conservation laws in thermoelasticity*".

2015-2019 **Dr. Emilio García Blanco**, PhD (1st supervisor),"*A polyconvex computational formulation for electro-activation in cardiac mechanics*".

2014-2018 **Dr. Osama Ibrahim Hassan**, PhD (1st supervisor),"*A vertex centred Finite Volume algorithm for fast solid dynamics: total and updated Lagrangian descriptions*".

2014-2018 **Dr. Scott Bagwell**, PhD (co-supervisor),"*A high order Finite Element coupled Multi-Physics approach to MRI scanner design*".

2014-2018 **Dr. Jibran Haider**, PhD (1st supervisor),"*An upwind cell centred Finite Volume Method for large strain explicit solid dynamics in OpenFOAM*".

2013-2018 **Dr. Roman Poya**, PhD (1st supervisor), "*High Order curvilinear Finite Elements for small and large deformation electromechanics: integrating CAD, mesh generation and finite element design for multiphysics problems*".

2011-2015 **Dr. Rogelio Ortigosa Martínez**, PhD (1st supervisor), "*A new variational framework for*

polyconvex large strain electromechanics".

2011-2015 **Dr. Michael Weberstadt**, PhD (1st supervisor), "*A high fidelity stabilised Finite Element method for fluid-structure interaction problems*".

2011-2015 **Dr. Liang Yang**, PhD (1st supervisor), "*An immersed computational framework for multiphase fluid-structure interaction*".

2011-2015 **Dr. Darong Jin**, PhD (2nd supervisor), "*An hp-Finite Element computational framework for nonlinear magneto-fluid problems including magnetostriction*".

2011-2015 **Dr. Dawn Morgan**, EngD (2nd supervisor), "*Design and optimisation of a vertical axis wind turbine housing to standards*".

2010-2014 **Dr. Miquel Aguirre Font**, PhD (co-supervisor), "*A vertex centred Finite Volume Method for solid dynamics*".

2007-2011 **Dr. Iziam Karimba**, PhD (2nd supervisor), "*A two-step Taylor Galerkin formulation for explicit solid dynamics large strain problems*".

2007-2011 **Dr. Chun Hean Lee**, PhD (1st supervisor), "*Development of a cell centred upwind finite volume algorithm for a new conservation law formulation in structural dynamics*".

2004-2008 **Dr. Javier Silla Sánchez**, PhD (2nd supervisor), "*Fluid structure interaction for haemodynamic and biological applications*".

Visiting researchers and academics

- [*October 2021 to January 2022*] Dr. Robin Pefferkorn, Karlsruhe Institute of Technology, Germany.
- [*March to July 2020*] Dr. Jesús Martínez Frutos, University of Cartagena, Spain.
- [*September to December 2019*] Mr. Josep Escrig Forner, Universidad de Castellón, Spain.
- [*September 2018*] Prof. Christian Hesch, Siegen University, Germany.
- [*August to September 2018*] Dr. Marlon Franke, Karlsruhe Institute of Technology, Germany.
- [*April 2018*] Prof. Pierre-Henri Maire, CEA, France.
- [*July to September 2017*] Dr. Alexander Janz, Karlsruhe Institute of Technology, Germany.
- [*April 2014, April 2015, April 2016*] Dr. Rado Flajs, University of Ljubljana, Slovenia.
- [*November 2015*] Dr. Davorin Penava, University of Osijek, Croatia.
- [*June 2013, June 2014*] Prof. Guglielmo Scovazzi, Duke University, USA.

Research stays

- [*September 2019*] LaCan, Universitat Politecnica de Catalunya, Spain (host: Prof. Antonio Huerta).
- [*June 2019 and December 2019*] Department of Civil Engineering, Czech Technical University, Prague (host: Dr. Martin Horak).
- [*September 2017*] Faculty of Civil and Geodetic Engineering, University of Ljubljana, Slovenia (host: Dr. Rado Flajs).
- [*July 2017*] Faculty of Civil Engineering, University of Osijek, Croatia (host: Dr. Davorin Penava).
- [*October 2014*] Department of Civil Engineering, Duke University, USA (host: Prof. Guglielmo Scovazzi).

Some recent journal publications

- P. Refachinho de Campos, **A.J. Gil**, C.H. Lee, M. Giacomini and J. Bonet, "A New Updated Reference Lagrangian Smooth Particle Hydrodynamics algorithm for isothermal elasticity and elasto-plasticity", *Computer Methods in Applied Mechanics and Engineering*, Volume 392, 114680, 2022, doi:10.1016/j.cma.2022.114680.
- F. Marín, J. Martínez-Frutos, R. Ortigosa and **A.J. Gil**, "Viscoelastic up-scaling rank-one effects in in-silico modelling of electro-active polymers", *Computer Methods in Applied Mechanics and Engineering*, Volume 389, 114358, 2022, doi: 10.1016/j.cma.2021.114358.
- M. Franke, R. Ortigosa, J. Martínez-Frutos, **A.J. Gil**, and P. Betsch, "A thermodynamically consistent time integration scheme for non-linear thermo-electro-mechanics", *Computer Methods in Applied Mechanics and Engineering*, Volume 389, 114298, 2022, doi: 10.1016/j.cma.2021.114298.
- J. Martínez-Frutos, R. Ortigosa and **A.J. Gil**, "In-silico design of electrode meso-architecture for shape morphing dielectric elastomers", *Journal of the Mechanics and Physics of Solids*, 2021, doi: 10.1016/j.jmps.2021.104594.
- G. Barroso, M. Seoane, **A. J. Gil**, P. D. Ledger, A. Huerta, M. Mallett, "A staggered high-dimensional Proper Generalised Decomposition for coupled magneto-mechanical problems with application to MRI scanners", *Computer Methods in Applied Mechanics and Engineering*, Volume 370, 2020, doi: 10.1016/j.cma.2020.113271

Record of Award and Management of Projects

Principal Investigator	**£3,165,000**	(using 1.2€=1£) in a total of **15 research projects** (from various funding bodies, such as UK EPSRC, H2020, Wales NRN)
Co-Investigator	**£428,700**	(using 1.2€=1£) in a total of **5 research projects** (from various funding bodies, including UK EPSRC, FP7, H2020, Wales NRN)

List of successful research proposals

2023-2027 **Principal Investigator** of **DSTL award** at Swansea University.
Title: Data-informed in-silico modelling of multi-material Electro Active Polymer based soft robots.
Total budget: **£60.1 K**.

2023-2027 **Principal Investigator** of **EPSRC case award with DSTL support** at Swansea University.
Title: Time varying control of multi-material Electro-Active Polymer soft robots.
Total budget: **£140.0 K**.

2023-2027 **Principal Investigator** of **AWE award** at Swansea University.
Title: A novel Arbitrary Eulerian Lagrangian computational framework.
Total budget: **£91.0 K**.

2022 **Principal Investigator** of **HEFCW award** at Swansea University.
Title: Equipment support: DIW 3D printer.
Total budget: **£62.5 K**.

2021-2024 **Principal Investigator** of **DSTL award** at Swansea University.
Title: Accelerated in-silico characterisation, topology optimisation and design of Electro Active Polymer based soft robots.
Total budget: **£100.0 K**.

2021-2024 **Principal Investigator** of **EPSRC case award with Siemens support** at Swansea University.
Title: A new computational tool for the analysis of Floor Borne Vibrations on the performance and image quality of MRI scanners.
Total budget: **£121.5 K**.

2021-2024 **Co-Principal Investigator** of **EPSRC case award** at Swansea University.
Title: Development of a Machine Learning algorithm for predictive maintenance of MRI scanners.
Total budget: **£121.5 K**.

2017-2022 **Principal investigator** at Swansea University in **H2020 Marie Curie ETN**
Title: Industrial decision-making on complex production technologies supported by simulation-based engineering (ProTechTion)
Total budget: **€3.83 M**.
Budget allocated to Swansea University: **€546.5 K**.

2017-2020 **Host academic** in **Sêr Cymru II** Early Career Personal Research Fellowship award at Swansea University.
Title: Engineering the new generation of biomimetic artificial muscles.
Total budget: **£150.0 K**.

2015-2019 **Principal investigator** at Swansea University in **H2020 Marie Curie ETN**
Title: Empowered decision-making in simulation-based engineering: Advanced Model Reduction for real-time, inverse and optimization in industrial problems (AdMoRE)
Total budget: **€2.08 M**.
Budget allocated to Swansea University: **€273.3 K**.

2015-2018 **Host academic** in **Sêr Cymru National Research Network** Early Career Personal Research Fellowship award at Swansea University.
Title: Bridging the gap between computational fluid and solid dynamics: embedding advanced technologies into Welsh industries through massive parallelisation.
Total budget: **£150.0 K**.

2014-2017 **Principal Investigator** in **Sêr Cymru National Research Network** PostDoctoral award at Swansea University.
Title: Towards the next generation of fast dynamics computational fracture solvers in Engineering.
Total budget: **£75.0 K**.

2014-2017 Co-investigator in **Sêr Cymru National Research Network** PhD award at Swansea University.
Principal investigator at Cardiff University: Dr. S. Kulasegaram
Title: Towards the next generation of fast dynamics solvers in Engineering.
Total budget: **£57.0 K**.

2014-2017 **Co-Principal Investigator** of **EPSRC case award** at Swansea University.
Title: Development of coupled electro-mechanical simulation techniques for MRI scanners.
Total budget: **£91.5 K**.

2013-2018 **Principal Investigator** at Swansea University in **Erasmus Mundus MSc**
Title: MSc in Computational Mechanics
Total estimated budget: **€1.99 M** (for a total number of 50 MSc students)
Estimated budget allocated to Swansea University: **€0.60 M**.

2013-2020 **Principal Investigator** at Swansea University in **Erasmus Mundus PhD**
Title: Simulation-based Engineering and Entrepreneurship Development (SEED)
Total estimated budget: **€6.54 M** (for a total number of 50 PhD students)
Estimated budget allocated to Swansea University: **€1.04 M**.

2012-2015 The **Philip Leverhulme Prize**
Total budget: **£70 K**.

2012-2013 **Principal investigator** in **one-year PostDoc Scheme** funded by College of Engineering, Swansea

University
Title: Immersed Structural Potential Method for fluid structure interaction applications
Total budget: **£40 K**.

2009-present Academic contributor in the Centre of Nano-Health (CNH) **European Research project**
Total funding: **£21.6 M**
£10 M from the European Regional Development Fund (ERDF) via the Welsh European Funding Office (WEFO)
£11.6 M match funding from Swansea University, WAG Health Department, Industry and NHS.

2010-2013 Co-investigator in **FP7 Marie Curie ITN** European Research project
Principal investigator at Swansea University: Prof. J. Bonet
Title: Advanced Techniques in Computational Mechanics (ATCoME)
Total budget: **€217,8 K**.

2011-2012 **Principal investigator** in **Welsh Crucible Small Grant Scheme** funded by HEFCW
Title: Development of a new sustainable elastomeric energy harvester for marine environments
Total budget: **£9 K**.

2011-2012 Co-investigator in **Welsh Crucible Small Grant Scheme** funded by HEFCW
Principal investigator at Swansea University: Dr. R. van Loon
Title: Towards the next generation devices for real-time monitoring and drug delivery in the gastro-intestinal system
Total budget: **£7,2 K**.

2008-2011 **Principal investigator** in **EPSRC First Grant EP/F03010X/1** Research project
Title: Immersed Finite Element Method for haemodynamic medical applications
Total funding: **£310,3 K**.

Invited presentations/seminars

- Co-author in **Plenary Lecture** by J. Bonet, A.J. Gil and C.H. Lee, "First order conservation law formulations in solid dynamics: applications to dynamic crack propagation, contact mechanics and stable SPH discretizations", 9$^{\text{th}}$ International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering, Athens, Greece, 2023.
- **Keynote lecture** at the 17th SPHERIC International Workshop, 27-29 June 2023, Rhodes, Greece.
- **Keynote lecture** at the 4th International Online workshop on SPH, September 2022, with the presentation entitled "Entropy-stable Smooth Particle Hydrodynamics for large strain solid dynamics using first order conservation laws".
- Invited seminar "Computational modelling of advanced soft materials" at the Department of Structural Mechanics, Faculty of Engineering, Kyoto University, Japan, May 2022.
- Invited seminar "On the use of mixed formulations for computational polyconvexity and multi-variable convexity" at the prestigious NECAS seminar series, Czech Technical University, Prague, January 2021.
- **Plenary Lecture** at the ECCOMAS thematic conference "Computational Modelling of Complex Materials Across the Scales" held in Glasgow, UK, October 2019.
- **Plenary Lecture** at the ECCOMAS thematic conference "Modern Finite Element Technologies - Mathematical and Mechanical Aspects" held in Glasgow, Germany, July 2019.
- Invited seminar "A new framework for large strain electromechanics based on convex multi-variable strain energies", Department of Civil Engineering, Czech Technical University, Prague, June 2019. This seminar was delivered as part of a two-week research stay fully funded by the Host Institu-

tion as part of a funding scheme launched by the Czech Technical University aimed at establishing collaboration with leaders in the field of computational mechanics.

- **Invited Lecture** at the very prestigious Mathematical Workshop held in Oberwolfach, Germany, October 2018.
- **Invited Lecture** for the international workshop on "Computational Haemodynamics", held at the School of Engineering, Saint Etienne, France, November 2018.
- Invited seminar "Bridging methodologies for the computational simulation of fluids, solids and electromechanics", Culham Centre for Fusion Technology, Culham, UK, February 2018.
- Invited seminar "Towards the next generation of fast solid/fluid dynamics solvers in Virtual Prototyping", ESI Group, Paris, France, December 2017.
- **Invited lecturer** for the ETN AdMoRe Winter School, UPC Barcelona, Spain, January 2018.
- Invited Seminar "Bridging methodologies for the computational simulation of fluids and solids", Faculty of Civil and Geodetic Engineering, University of Ljubljana, Slovenia, September 2017.
- **Plenary Lecture** "A new framework for large strain electromechanics based on convex multi-variable strain energies", Slovenian Society of Computational Mechanics, Dobrna, Slovenia, September 2017.
- **Plenary Lecture** "A new framework for large strain electromechanics based on convex multi-variable strain energies", Croatian Society of Computational Mechanics, Osijek, Croatia, July 2017.
- **Invited lecturer** for the 4th Swansea-Tsinghua workshop on computational engineering, Zienkiewicz Centre for Computational Engineering, Swansea, July 2017.
- **Semiplenary Lecture** "A new framework for large strain electromechanics based on convex multi-variable strain energies", 7^{th} European Congress on Computational Methods in Applied Sciences and Engineering, Crete, 2016.
- **Invited lecturer** for the 4^{th} "UK Association of Computational Mechanics in Engineering (ACME) School", Swansea, UK, April 2015.
- Invited seminar "The Immersed Structural Potential Method (ISPM) for the analysis of Fluid Structure Interaction (FSI) problems", Department of Civil and Environmental Engineering, Duke University, USA, October 2014.
- **Keynote lecture** "A computational framework for polyconvex large strain electromechanics", 11^{th} World Congress WCCM and 8^{th} European Congress ECCMASE in Computational Mechanics, Barcelona, 2014.
- Co-author in **Semiplenary lecture** by J. Bonet and A.J. Gil, "A first order conservation law framework for computational solid dynamics", 11^{th} World Congress WCCM and 8^{th} European Congress ECCMASE in Computational Mechanics, Barcelona, 2014.
- Invited seminar "Bridging methodologies for the computational simulation of solids and fluids", Universidad de Granada, April 2014.
- **Invited lecturer** for the "ITN ATCOME Summer School on Computational Mechanics for Moving Boundaries and Interfaces", UPC Barcelona, Spain, October 2013.
- **Invited lecturer** for the "Computational Mechanics Summer School" organised by Ecole Centrále de Nantes, June 2013.
- Co-author in **Keynote Lecture** by J. Bonet and A. J. Gil "A new variational formulation for large strain piezoelectric hyperelastic materials", 5^{th} International Conference on Computational Methods for coupled problems in science and engineering, Ibiza, Spain, June 17-19, 2013.
- **Keynote Lecture** "An enhanced Immersed Structural Potential Method (ISPM) for the simulation of fluid-structure interaction problems", 5^{th} International Conference on Computational Methods for coupled problems in science and engineering, Ibiza, Spain, June 17-19, 2013.
- Invited seminar "Computational simulation of multiphysics: fluids, structures, electromagnetics",

Sheffield Hallam University, June 2013.

- Invited seminar "Bridging methodologies for the computational simulation of solids and fluids", University of Sheffield, June 2013.
- Invited seminar "Computational multiphysics: fluids, structures, electromagnetics", Chair of Applied Mechanics, Siegen University, Germany, October 2012.
- Invited seminar "The Immersed Structural Potential Method (ISPM) for fluid-structure interaction", Departamento de Matemática Aplicada II, Universitat Politècnica de Catalunya, Spain, September 2012.
- **Invited contribution** "An enhanced Immersed Structural Potential Method for haemodynamic applications" to the 6^{th} European Congress in Computational Mechanics, Vienna, September 2012.
- Invited seminar "Computational multiphysics: fluids, structures, electromagnetics", Department of Applied Mechanics, Sun-Yat sen University, China, May 2012.
- Invited seminar "Engineering heart valves: immersed computational modelling", Department of Biomedical Engineering, Sun-Yat sen University, China, May 2012.
- Invited seminar "Kernel stabilisation of the Immersed Structural Potential Method (ISPM) for fluid-structure interaction", Department of Aerospace Engineering, Tsinghua University, September 2011.
- Invited seminar "The Immersed Structural Potential Method (ISPM) for fluid-structure interaction", Wales Institute of Mathematical and Computational Sciences (WIMCS), Annual meeting, December 2010.
- Invited seminar "Recent advances on the ISPM for fluid structure interaction haemodynamic applications", C^2EC seminar series, Swansea, December 2010.
- Invited seminar "Recent developments in computational fluid-structure interaction" at the Annual meeting of the "The Airbus Flight Physics Distributed R&T Partnership - DiPaRT", November 2010.
- Invited seminar "Computational numerical methods for cardiac modelling", Wales Heart Research Institute, February, 2010.
- Co-author in **Semiplenary Lecture** by J. Bonet and A.J. Gil, "Two step Taylor-Galerkin solution of Lagrangian explicit solid dynamics", 8^{th} World Congress WCCM and 5^{th} European Congress ECCMASE in Computational Mechanics, Venice, 2008.
- **Invited contribution** "Superplastic forming of patient-specific dental and maxillofacial prostheses" to the 8^{th} World Congress and 5^{th} European Congress in Computational Mechanics, Venice, 2008.
- Invited seminar "Dynamic analysis of prestressed structural membranes", C^2EC seminar series, Swansea, December 2007.
- Invited seminar "Structural analysis of prestressed Saint Venant-Kirchhoff hyperelastic membranes", Solid Mechanics Group, Oxford University, February 26, 2007.

Editorial Board Membership

- Finite Elements in Analysis and Design
- European Journal of Computational Mechanics

Selection of Journal Referee

- Computer Methods in Applied Mechanics and Engineering
- Journal of Computational Physics

- Journal of the International Association of Shells and Spatial Structures
- International Journal for Numerical Methods in Biomedical Engineering
- Applied Mathematical Modelling
- Finite Element Analysis and Design
- European Journal of Mechanics A/Solids
- International Journal of Non-linear Mechanics
- Journal of the Mechanics and Physics and Solids

Conference and mini-symposia organisation

- Organiser of mini-symposium "*Computational frameworks for complex finite deforming systems*", World Congress on Computational Methods in Applied Sciences and Engineering, Paris, France, July 2020.
- Organiser of mini-symposium "*Locking, efficiency and robustness of finite elements and other discretization schemes*", World Congress on Computational Methods in Applied Sciences and Engineering, Paris, France, July 2020.
- Organiser of mini-symposium "*Coupled problems in material mechanics*", 17^{th} European Mechanics of Material Conference, Madrid, Spain, May 2020.
- **Organiser of Summer School** "*State of the art computational methods for nonlinear solid mechanics*", Pavia, Italy, July 2019. Attendees: 30 PhD/MSc students.
- Organiser of mini-symposium "*Coupled problems*", SES 2018 Society of Engineering Science, Madrid, Spain, October 2018.
- Organiser of mini-symposium "*Experiments and modelling of smart active materials with electro- and magneto-mechanical coupling*", European Congress on Computational Methods in Applied Sciences and Engineering, Glasgow, UK, June 2018.
- Organiser of mini-symposium "*Advanced Modelling of Multi-physics Problems Involving Electric and Magnetic Effects*", ECCOMAS Coupled Problems, Rhodes Island, Greece, June 2017.
- Organiser of mini-symposium "*Advances in Finite Element Methods for Tetrahedral Mesh Computations*", European Congress on Computational Methods in Applied Sciences and Engineering, Crete Island, Greece, June 2016.
- Organiser of mini-symposium "*Advances in Finite Element Methods for Tetrahedral Mesh Computations*", 12^{th} World Congress on Computational Mechanics, Seoul, Korea, 2016.
- **Principal Chairman** of the 23^{rd} Conference of the UK Association of Computational Mechanics in Engineering, April 2015.
- Organiser of mini-symposium "*Advances in Finite Element Methods for Tetrahedral Mesh Computations*", US Congress Computational Mechanics 2015, San Diego.
- Organiser of mini-symposium "*Advanced immersed methods for fluid-structure interaction*", US Congress Computational Mechanics 2015, San Diego.
- Organising committee member for the UK Ground Engineering Group biannual symposia "*Current technology in geotextiles*", April 2010.
- Organising committee member for the 1^{st} International Conference on "*Computational and Mathematical Biomedical Engineering*", 2009.
- Organising committee member for the UK Ground Engineering Group biannual symposia "*Geotechnics of coastal defences*", April 2008.

Participation in PhD or Habilitation examination Panels

- [July 2023] **Dr. Christophe-Alexandre Sony Chalons-Mouriesse**, University of Glasgow, U.K.
- [June 2023] **Prof. Thomas Heuzé**, École Centrale de Nantes, France.
- [June 2023] **Dr. Andrew Whelan**, University College Dublin, Ireland.
- [April 2023] **Dr. Beatriz Blanco**, Universidad de Granada, Granada, Spain.
- [July 2022] **Dr. Xipeng Lyu**, Nottingham University, Nottingham, UK.
- [April 2021] **Dr. Dario Schiano**, University College London, London, UK.
- [March 2021] **Dr. Jorge Antonio Molina Moya**, Universidad de Granada, Granada, Spain.
- [February 2021] **Dr. Michael Neunteufel**, Technical University of Viena, Viena, Austria.
- [December 2019] **Dr. Martin Doskar**, Czech Technical University, Prague, Check Republic.
- [December 2019] **Dr. Jorge de Anda Salazar**, École Centrale de Nantes, France.
- [September 2019] **Dr. Rubén Ibáñez**, Universitat Politècnica de Catalunya, Spain.
- [September 2019] **Dr. Giacomo Quaranta**, Universitat Politècnica de Catalunya, Spain.
- [July 2019] **Dr. Wenjun Tan**, Swansea University, U.K.
- [December 2018] **Dr. Adrien Renaud**, École Centrale de Nantes, France.
- [February 2017] **Dr. Joaquín Navarro Zafra**, University of Sheffield, U.K.
- [November 2016] **Ms. Mar Giralt, MPhil**, Swansea University.
- [March 2016] **Dr. Desmond Dillon-Murphy**, King's College London, U.K.
- [January 2016] **Dr. Sergio Conde Martín**, Universidad Politecnica de Madrid, Spain.
- [October 2013] **Dr. Frances Verdugo**, Universitat Politècnica de Catalunya, Spain.

Positions of trust

- **Technical Committee member** for the Computational Solids and Structural Mechanics Panel of the European Community in Computational Methods and Applied Sciences (ECCOMAS), since 2021.
- **Executive Committee member** of the SPH rEsearch and engineeRing International Community (SPHERIC), since 2021.
- **Executive Committee member** of the UK Association of Computational Mechanics (UK-ACM) from 2015 to 2017.
- Committee member of the UK Superplastic Materials Committee.
- Committee member of the Technical Advisory Panel for the biennial ECCOMAS International Conference on "Modern Finite Element Technologies - Mathematical and Mechanical Aspects - M-FET".
- Committee member of the Technical Advisory Panel for the biennial ECCOMAS International Conference on "Textile Composites and Inflatable Structures".
- Committee member of the Technical Advisory Panel for the biennial ECCOMAS International Conference on "Coupled Problems in Science and Engineering".
- Committee member of UK Ground Engineering Group (GEG), working group within the Institution of Civil Engineers (ICE).