

Curriculum Vitae

Ali Hashemian, Ph.D.

Keywords and Research Interests

Computational Mathematics, High-performance Computing, Numerical Analysis, Finite Element Analysis, Finite Volume Analysis, Isogeometric Analysis, Coupled Multi-field Problems, Computational Fluid Dynamics, Fluid–Solid Interaction, Electromagnetics, Eigenvalue Analysis, Computer-aided Design and Manufacture, Statistical Analysis, Engineering Optimization, Deep Learning Inversions and Artificial Intelligence.

Researcher IDs

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Education

2014	Ph.D. in Mechanical Engineering (Solid Mechanics).	Ferdowsi University of Mashhad, Mashhad, Iran.
2008	M.Sc. in Mechanical Engineering (Applied Design).	Ferdowsi University of Mashhad, Mashhad, Iran.
2006	B.Sc. in Mechanical Engineering (Solid Mechanics).	Ferdowsi University of Mashhad, Mashhad, Iran.

Academic Experience

2019–present	Research Fellow	BCAM – Basque Center for Applied Mathematics, Bilbao, Spain.
2014–2019	Lecturer (Assistant Prof.)	Hakim Sabzevari University, Sabzevar, Iran.
2012–2014	Research Assistant	Simon Fraser University, Vancouver, Canada.
2008–2012	Research Assistant	Ferdowsi University of Mashhad, Mashhad, Iran.

Publications

Scientific journal papers:	25 JCR papers, 18 in Q1 and 13 in D1 journals
Conference papers:	17 presentations
Received citations:	369 (source Google Scholar)
h-index:	13 (source Google Scholar)

Participation in International R&D&I Projects

Principal investigator (PI) in:	2 European Horizon 2020 projects (competitive calls) 1 Euskampus Missions program (competitive calls) 3 Academic-Industrial projects (in Iran)
Research member in:	1 European Horizon 2020 project (competitive call) 3 Projects of Spanish Ministry of Science and Innovation (competitive calls) 1 Project of Spanish Ministry of Economy and Competitiveness (competitive call) 1 Euskampus Missions program (competitive calls) 2 Academic-Industrial projects (in Canada)

Grants and Awards

2021–2023	Postdoctoral grant, 64.000 €.	BCAM Severo Ochoa, Spain (competitive call).
2019–2021	Postdoctoral grant, 60.000 €.	BCAM Severo Ochoa, Spain (competitive call).
2012–2014	Predocctoral grant, 36.000 \$CA.	Simon Fraser University, Canada.
2008–2012	Predocctoral grant, 44.000 \$US.	Iranian Ministry of Science and Technology (competitive call).
2020	Best Paper Award.	For presenting in SPM2020 Conference. The paper is published in a special issue of the Elsevier journal <i>Computer-Aided Design</i> v.127 pp.102868 (2020).

Programming and Software Skills

Programming Languages:	C, Python, UNIX Shell
Programming Software/Packages:	MATLAB, FEniCSx, PETSc, PetIGA
Commercial Engineering Packages:	ANSYS, LS-DYNA, ADAMS, SolidWorks, Mastercam, AutoCAD
Drafting packages:	LATEX, Microsoft Office (Word, Excel, Project, etc)

Teaching experience

2015–2019	Postgraduate courses:	Advanced Math, Computer-Aided Design, Engineering Optimization, Vibration of Continuous Systems
2008–2019	Undergraduate courses:	Engineering Math, Computer Programming, Engineering Mechanics, Management and Process Control, Mechanics of Materials, Kinematics and Dynamics of Machines, Mechanical Vibration, Machine Design, Manufacturing Methods

Organized Workshops and Minisymposia

2022	Minisymposium	Advanced HPC Methods for Eigenvalue Problems and Beyond (15th World Congress on Computational Mechanics WCCM-APCOM 2022), Yokohama, Japan.
2022	Minisymposium	HPC Methods for Eigenvalue Problems in Applied Science and Engineering (8th European Congress on Computational Methods in Applied Sciences and Engineering ECCOMAS 2022), Oslo, Norway.
2021	Workshop	HPC, Deep Learning, and Numerics in Geophysics, Bilbao, Spain.

European Union's and Spanish R&D&I Projects (competitive calls)

2018–2023	European project. Grant No. 777778. Marie Skłodowska-Curie Actions, Horizon 2020 European Union RISE Project. Multiscale Inversion of Porous Rock Physics using High-Performance Simulators: Bridging the Gap between Mathematics and Geophysics – MATHROCKS (765.000 €). Role: PI at BCAM.
2020–2023	European project. Grant No. 862025. Horizon 2020 European Union FET Open Project. Analysis, Design, and Manufacturing using Microstructures – ADAM2 (3.399.903 €, PI: Michael Bartoň). Role: Research member.
2022–2023	Spanish national project. PDC2021-121093-I00. Spanish Ministry of Science and Innovation. Projects of the Proof of Concept. Subsurface Electromagnetic Imaging Numerical Tools for the Industry – SUBEM (85.000 €, PI: David Pardo). Role: Main research core.
2020–2024	Spanish national project. PID2019-108111RB-I00. Spanish Ministry of Science and Innovation. Real-time Inversion using Deep Learning Methods – DEEPINVERSE (112.400 €, PI: David Pardo). Role: Main research core.
2020–2023	Spanish national project. PID2019-104488RB-I00. Spanish Ministry of Science and Innovation. Manufacturing of Curved Objects via Path Design of Custom-shaped Tools – MACROPISTAS, (90.750 €, PI: Michael Bartoň). Role: Main research core.
2017–2019	Spanish national project. MTM2016-76329-R. Spanish Ministry of Economy and Competitiveness. Electromagnetic Imaging of the Earth's Subsurface using Advanced Galerkin Methods, (90.871 €, PI: David Pardo). Role: Research member since 06/2019.
2022–2023	Misiones Euskampus 1.0, Programa 2021. Structural health diagnostics of offshore wind platforms using artificial intelligence techniques (DIA) (9.000 €). Role: PI at BCAM.
2023–2024	Misiones Euskampus 2.0, Programa 2022. Nuevas técnicas y modelos eficientes, autónomos y autoconfigurables de Inteligencia Artificial para el análisis sostenible de datos (ORLEG-IA) (24.000 €, PI: Javier Del Ser). Role: Main research core.

Selected International Research Network

Since 2017	Alessandro Reali Saeid Hadidimoud Seyed Farhad Hosseini	Highly Cited Researcher , University of Pavia, Italy Coventry University, England Hamburg University of Technology, Germany
Since 2019	Victor Calo David Pardo Michael Bartoň Enzo Marino Pengbo Bo Esmail Lakzian	Highly Cited Researcher , Curtin University, Australia University of the Basque Country UPV/EHU, Spain Basque Center for Applied Mathematics, Spain University of Florence, Italy Harbin Institute of Technology, China Andong National University, South Korea
Since 2020	Norberto López de Lacalle	Highly Cited Researcher , University of the Basque Country UPV/EHU, Spain
Since 2021	Carla Manni Quanling Deng	University of Rome Tor Vergata, Italy Australian National University, Australia
Since 2022	Sara Remogna Domingo Barrera	University of Torino, Italy University of Granada, Spain

Language Skills

English	Advanced.	IELTS score 7.0 (equal to Level C1), Certificated by British Council.
Spanish	Advanced.	Level B2, Certificated by the Official Language School of Bilbao (Spain).
Persian	Native.	

Scientific Journal Papers (peer-reviewed)

1. **A Hashemian**, H Sliusarenko, S Remogna, D Barrera, M Bartoň. 2023. Solving boundary value problems via the Nyström method using spline Gauss rules. *Computers & Mathematics with Applications*, 143, 33-47. **Q1-D1 (top 10%)**.
2. **A Hashemian**, D Garcia, D Pardo, VM Calo. 2022. Refined Isogeometric Analysis of Quadratic Eigenvalue Problems. *Computer Methods in Applied Mechanics and Engineering*, 399, 115327. **Q1-D1 (top 10%)**.
3. **A Hashemian**, D Pardo, VM Calo. 2021. Refined isogeometric analysis for generalized Hermitian eigenproblems. *Computer Methods in Applied Mechanics and Engineering*, 381, 113823. **Q1-D1 (top 10%)**.
4. **A Hashemian**, D Garcia, JA Rivera, D Pardo, 2021. Massive Database Generation for 2.5D Borehole Electromagnetic Measurements using Refined Isogeometric Analysis. *Computers & Geosciences*, 155, 104808. **Q1 (top 25%)**.
5. D Hoseinzade, E Lakzian, **A Hashemian**. 2021. A blackbox optimization of volumetric heating rate for reducing the wetness of the steam flow through turbine blades. *Energy*, 220, 119751. **Q1-D1 (top 10%)**.
6. **A Hashemian**, P Bo, M Bartoň. 2020. Reparameterization of Ruled Surfaces: Toward Generating Smooth Jerk-minimized Toolpaths for Multi-axis Flank CNC Milling. *Computer-Aided Design*, 127, 102868. **Q1-D1 (top 10%)**.
7. **A Hashemian**, E Lakzian, A Ebrahimi-Fizik. 2020. On the Application of Isogeometric Finite Volume Method in Numerical Analysis of Wet-Steam Flow through Turbine Cascades. *Computers & Mathematics with Applications*, 79, 1687–1705. **Q1-D1 (top 10%)**.
8. SF Hosseini, **A Hashemian**, A Reali. 2020. Studies on Knot Placement Techniques for the Geometry Construction and the Accurate Simulation of Isogeometric Spatial Curved Beams. *Computer Methods in Applied Mechanics and Engineering*, 360, 112705. **Q1-D1 (top 10%)**.
9. E Marino, SF Hosseini, **A Hashemian**, A Reali. 2020. Effects of parameterization and knot placement techniques on primal and mixed isogeometric collocation formulations of spatial shear-deformable beams with varying curvature and torsion. *Computers & Mathematics with Applications*, 80, 1555–1575. **Q1-D1 (top 10%)**.
10. A Ebrahimi-Fizik, E Lakzian, **A Hashemian**. 2020. Numerical investigation of wet inflow in steam turbine cascades using NURBS-based mesh generation method. *International Communications in Heat and Mass Transfer*, 118, 104812. **Q1-D1 (top 10%)**.
11. **A Hashemian**, SF Hosseini. 2019. Nonlinear bifurcation analysis of statically loaded free-form curved beams using isogeometric framework and pseudo-arclength continuation. *International Journal of Non-Linear Mechanics*, 113, 1–16. **Q1 (top 25%)**.
12. A Ebrahimi-Fizik, E Lakzian, **A Hashemian**. 2019. Entropy generation analysis of wet-steam flow with variation of expansion rate using NURBS-based meshing technique. *International Journal of Heat and Mass Transfer*, 139, pp. 399–411. **Q1-D1 (top 10%)**.
13. **A Hashemian**, SF Hosseini. 2018. An integrated fitting and fairing approach for object reconstruction using smooth NURBS curves and surfaces. *Computers & Mathematics with Applications*, 76, 1555–1575. **Q1-D1 (top 10%)**.
14. SF Hosseini, **A Hashemian**, A Reali. 2018. On the application of curve reparameterization in isogeometric vibration analysis of free-form curved beams. *Computers & Structures*, 209, 117–129. **Q1-D1 (top 10%)**.
15. H Saghi, **A Hashemian**. 2018. Multi-dimensional NURBS model for predicting maximum free surface oscillation in swaying rectangular storage tanks. *Computers & Mathematics with Applications*, 76, 2496–2513. **Q1-D1 (top 10%)**.
16. **A Hashemian**, BM Imani. 2018. Surface fairness: a quality metric for aesthetic assessment of compliant automotive bodies. *Journal of Engineering Design*, 29, 41–64. **Q1 (top 25%)**.
17. SF Hosseini, **A Hashemian**, BM Imani, S Hadidimoud. 2018. Isogeometric analysis of free-form Timoshenko curved beams including the nonlinear effects of large deformations. *Acta Mechanica Sinica*, 34, 728–743. **Q1 (top 25%)**.
18. **A Hashemian**, BM Imani. 2018. A new quality appearance evaluation technique for automotive bodies including effect of flexible parts tolerances. *Mechanics Based Design of Structures and Machines*, 46, 157–167.

19. O Sadikhani, **A Hashemian**. 2018. Nonlinear computer-aided tolerance analysis of mechanical assemblies using improved second-order method. *Modares Mechanical Engineering*, 18, 457–466.
20. **A Hashemian**, SF Hosseini, SN Nabavi. 2017. Kinematically smoothing trajectories by NURBS reparameterization – an innovative approach. *Advanced Robotics*, 31, 1296–1312.
21. **A Hashemian**, BM Imani. 2016. Effect of Flexible-Body Assembly Errors on Appearance Quality of Automotive Bodies. *Modares Mechanical Engineering*, 16, 375–386.
22. **A Hashemian**, BM Imani. 2015. An improved sensitivity-free probability analysis in variation assessment of sheet metal assemblies. *Journal of Engineering Design*, 25, 346–366. **Q1 (top 25%)**.
23. **A Hashemian**, BM Imani. 2015. Tolerance analysis of flexible sheet metal structures including effects of contact interaction and surface continuity of components. *Modares Mechanical Engineering*, 14, 199–208.
24. **A Hashemian**, BM Imani. 2014. Nonlinear Variation Analysis of Compliant Sheet Metal Assemblies Including Effect of Surface Continuity in Components. *Applied Mechanics and Materials*, 532, 503–509.
25. BM Imani, **A Hashemian**. 2012. NURBS-based profile reconstruction using constrained fitting techniques. *Journal of Mechanics*, 28, 407–412.

Selected Conference Papers and Presentations in last 5 years

1. **A Hashemian**, SF Hosseini, E Marino, A Reali. 2023. On the application of adaptive surface reconstruction technique for isogeometric analysis of freeform shells. 11th International Conference on Isogeometric Analysis (IGA 2023). Lyon, France.
2. **A Hashemian**, H Sliusarenko, S Remogna, D Barrera, M Bartoň. 2023. Spline Gauss Quadrature Rules for Solving Boundary Value Problems via Nyström Method. 2nd International Conference on Mathematical And Computational Modelling, Approximation And Simulation (MACMAS 2023). Torino, Italy.
3. **A Hashemian**, D Garcia, D Pardo, VM Calo. 2022. Performance of Refined Isogeometric Analysis in Solving Generalized and Quadratic Eigenvalue Problems. 8th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2022). Oslo, Norway.
4. **A Hashemian**, D Garcia, D Pardo, VM Calo. 2022. Refined Isogeometric Analysis for Quadratic Eigensystems of Vector-valued Multifield Problems. 15th World Congress on Computational Mechanics & 8th Asian Pacific Congress on Computational Mechanics (WCCM-APCOM 2022). Yokohama, Japan.
5. **A Hashemian**, D Garcia, JA Rivera, D Pardo. 2021. Refined isogeometric analysis for massive database generation for 2.5D borehole electromagnetic measurements. HPC, Deep Learning, and Numerics in Geophysics. Bilbao, Spain.
6. **A Hashemian**, D Garcia, JA Rivera, D Pardo. 2021. Refined Isogeometric Analysis: an Efficient Numerical Method for Massive Database Generation for 2.5D Borehole Electromagnetic Measurements. Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering & Technology (MMLDT-CSET 2021), San Diego, USA.
7. **A Hashemian**, D Garcia, JA Rivera, D Pardo. 2021. Database generation for 2.5D borehole resistivity measurements using refined isogeometric analysis. 15th Annual RES Users Conference (JURES21). Cáceres, Spain.
8. **A Hashemian**, M Bartoň, D Pardo. 2021. Spline Gauss Quadrature Rules for Refined Isogeometric Discretizations. 16th US National Congress on Computational Mechanics (USNCCM16). Chicago, USA.
9. **A Hashemian**, D Garcia, D Pardo, VM Calo. 2021. Refined Isogeometric Analysis for Solving Quadratic Eigenproblems in Electromagnetics. International Conference on Computational Science (ICCS 2021). Krakow, Poland.
10. **A Hashemian**, D Pardo, VM Calo. 2020. Refined Isogeometric Analysis for Generalized Real-Symmetric Eigenvalue Problems. 14th World Congress on Computational Mechanics (WCCM-ECCOMAS 2020). Paris, France.
11. E Marino, SF Hosseini, **A Hashemian**, A Reali. 2020. Effects of Parameterization and Knot Placement Techniques on Primal and Mixed IGA-C Formulations of Three-Dimensional Shear-Deformable Beams with Varying Curvature and Torsion. 14th World Congress on Computational Mechanics (WCCM-ECCOMAS 2020). Paris, France.
12. **A Hashemian**, P Bo, M Bartoň. 2020. Reparameterization of Ruled Surfaces: Toward Generating Smooth Jerk-minimized Toolpaths for Multi-axis Flank CNC Milling. Solid and Physical Modeling (SPM 2020). Strasburg, France.
13. **A Hashemian**, SF Hosseini, A Reali. 2019. Analysis-Suitable Parameterization for Isogeometric Simulation of Free-Form Structures: An Application to Curved Beams. VII International Conference on Isogeometric Analysis (IGA 2019), Munich, Germany.