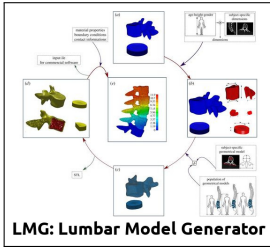
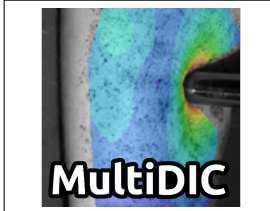
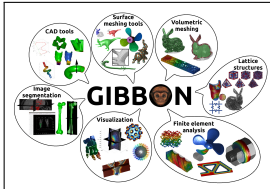




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## Software development



## Programming

MATLAB ★★★★★  
 Octave ★★★★★  
 Julia ★★★★★☆  
 Python ★★★★★☆  
 Arduino ★★★★★☆  
 Git/GitHub ★★★★★☆  
 LaTeX ★★★★★☆  
 Markdown ★★★★★☆  
 HTML ★★★★★☆

## CAD & FEA

FEBio ★★★★★  
 ABAQUS ★★★★★☆  
 FreeCAD ★★★★★☆  
 PTC/Creo ★★★★★☆  
 Inventor ★★★★★☆  
 SolidWorks ★★★★★☆

## Robotics



## References

Prof. Peter McHugh   
 Dr. Patrick McGarry   
 Prof. Aart Nederveen   
 Prof. Ciaran Simms

# Kevin Mattheus Moerman

## Computational Mechanics & Design Engineer

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## Employment history

- 05/2022-Now **Lecturer, Mechanical Engineering** [Mechanical Engineering, Uni. of Galway, Galway, Ireland](#)  
 Responsibilities: teaching undergraduate/postgraduate modules (e.g. Theory of Machines), supervision of (under)graduate students. Research: computational (bio)mechanics.
- 12/2021-Now **Senior Adjunct Lecturer** [Griffith Centre of Biomed.& Rehab. Eng., Griffith University, Australia](#)  
 Collaboration on soft tissue biomechanics and prosthetic socket research
- 07/2019-04/2022 **Lecturer, Biomedical Engineering** [Biomedical Engineering, Uni. of Galway, Galway, Ireland](#)  
 Responsibilities include teaching undergraduate/postgraduate modules (e.g. Computational Methods and FEA), supervision of (under)graduate students. Research: computational (bio)mechanics.
- 08/2018-08/2020 **Research Affiliate** [Biomechatronics, MIT Media Lab, Cambridge, MA, USA](#)  
 Collaboration on socket design research and NIH RO1 clinical trial.
- 08/2018-07/2019 **Research Fellow** [Biomedical Engineering, Uni. of Galway, Galway, Ireland](#)  
 Research: computational tools for in-silico trials of mechanical thrombectomy.
- 04/2017-08/2018 **Research Scientist** [Biomechatronics, MIT Media Lab, Cambridge, MA, USA](#)  
 Leader of the *Computational Biomechanics* research track. Research on computational and experimental biomechanics and prosthetic device design. Responsibilities: grant writing, co-supervision of (under)graduate students.
- 09/2015-04/2017 **Post Doctoral Associate** [Biomechatronics, MIT Media Lab, Cambridge, MA, USA](#)  
 Development of automated framework for design+optimization of subject-specific prosthetic sockets. Leader of the *Computational Biomechanics* research track. Responsibilities: grant writing, co-supervision of (under)graduate students.
- 01/2015-09/2015 **Research Affiliate** [Biomechatronics, MIT Media Lab, Cambridge, MA, USA](#)  
 Development of computational design methods for prosthetic devices. Co-supervisor and co-promotor for a PhD student.
- 04/2013-2018 **Visiting Research Fellow** [University of Dublin, Trinity College, Dublin, Ireland](#)  
 Collaboration on computational biomechanics, inverse finite element analysis, and the use of the GIBBON toolbox.
- 2011 - 2015 **Post Doctoral Research Fellow** [Academic Medical Centre, Amsterdam, The Netherlands](#)  
 Development of novel methods for non-invasive analysis of soft tissue mechanical properties based on inversion of MRE data, SPAMM tagged MRI, and inverse FEA.
- 2003 - 2006 **Design Engineer** [Lely Technologies N.V., Maassluis, The Netherlands](#)  
 Design and development of agricultural robotic systems, e.g. a robotic feed pusher and a solar energy powered mobile feeding robot.

## Education

- 08/2019-Now **PgCert in Teaching and Learning in Higher Education** [Uni. of Galway, Galway, Ireland](#)
- 05/2017-06/2017 **Kaufman Teaching Certificate Program** [MIT, Cambridge, USA](#)
- 02/2013-04/2013 **Course: Advanced MR Physics** [Universiteit Utrecht, Utrecht, The Netherlands](#)
- 08/2006-02/2012 **PhD in Bioengineering** [University of Dublin, Trinity College, Dublin, Ireland](#)  
 Thesis: *An Improved Framework for the Inverse Analysis of Skeletal Muscle Tissue In-vivo*
- 08/2008-08/2009 **Postgraduate Diploma in Statistics** [University of Dublin, Trinity College, Dublin, Ireland](#)
- 09/2006 **Course: Advances in Continuum Mechanics** [Durham University, Durham, UK](#)  
 Mathematics for Engineers EPSRC Summer School: *Advances in Continuum Mechanics, The Nonlinear Deformation of Solids.*
- 2004 - 2005 **MSc in Bioengineering** [University of Dublin, Trinity College, Dublin, Ireland](#)  
 Thesis: *A Finite Element Model of the Human Head to Predict and Analyse Brain Injury due to Blast-Induced Acceleration*
- 2000 - 2004 **BEng in Mechanical Engineering** [The Hague University of Appl. Sciences, The Hague, NL](#)  
 Major: *Product Design.* Final Project: *"The Design and Development of an Autonomic Solar Powered, Mobile Concentrate Feeding Robot for Cows".*

## Patents

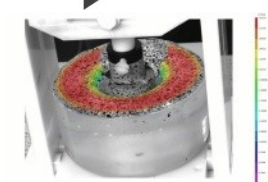
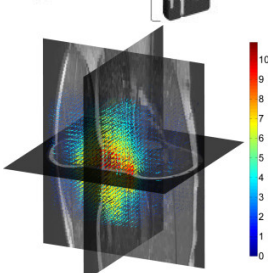
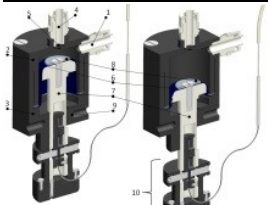
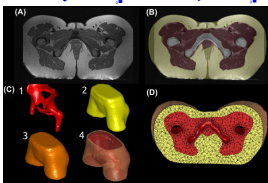
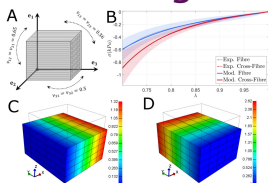
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EP1683411



## Publication figures



## Languages

English ★★★★★  
Dutch ★★★★★  
German ★★☆☆☆

## Membership

Senior Member IEEE  
Euro. Soc. for Biomech.  
Open Source Initiative

## Awards & Grants

- 2021 **Research grant: €265,532 (LERO/SFI Platform grant)** [LERO SFI research centre](#)  
Moerman KM (PI), Margaria T.(PI), *An MDD Platform for Automated Computational Design and Optimization of Prosthetic Sockets.*
- 2017 **Research grant: \$1,600,000 (R01 EB024531-01)** [USA National Institute of Health](#)  
Herr HM. (PI), Moerman KM.(Key Person), *Computational Design, Fabrication, and Evaluation of Optimized Patient-Specific Transtibial Prosthetic Sockets.*
- 2013 **Research grant: €710,500 (STW 12398)** [Netherlands Organisation for Scientific Research](#)  
Oomens C.(PI), Nederveen A. (PI), Moerman KM.(Key person), *Early diagnosis and prevention of pressure related deep tissue injury.*
- 2010 **Award: €1000 Engineers Ireland Biomedical Research Medal** [Engineers Ireland](#)  
Awarded at the 16th Bioengineering in Ireland Conference. Paper: *Towards the Non-Invasive Determination of the Mechanical Properties of Living Human Soft Tissue.*
- 2009 **Award: Bioengineering in Ireland Bronze Medal** [Royal Academy of Medicine Ireland](#)  
1st best paper at the 15th Bioengineering in Ireland Conference, Paper: *A validation method for motion tracking techniques based on tagged MRI.*
- 2005 **Award: €1000 Bachelor Thesis Prize** [The Royal Netherlands Society of Engineers, KIVI](#)  
3rd prize best Dutch bachelor thesis: *The Design and Development of Autonomic Solar Powered, Mobile Concentrate Feeding Robot for the Australian Dairy Industry.*

## Selected publications\*

\*A full list is available at end of this CV or online through my [ORCID](#) profile.

- Moerman KM et al., **Development of a patient-specific cerebral vasculature fluid-structure-interaction model**, *Journal of Biomechanics*, 2022. DOI: <https://doi.org/10.1016/j.jbiomech.2021.110896>. [OPEN ACCESS LINK](#)
- Moerman KM et al., **Automated and Data-driven Computational Design of Patient-Specific Biomechanical Interfaces** *Open Sci. Framework. PREPRINT*, 2021. DOI: 10.31224/osf.io/g8h9n.
- Moerman KM et al., **Novel Hyperelastic Models for Large Volumetric Deformations** *Int. J. of Solids and Structures*, 2020. DOI: 10.1016/j.ijsolstr.2020.01.019. [OPEN ACCESS LINK](#)
- Moerman KM., **GIBBON: The Geometry and Image-Based Bioengineering add-On.** *Journal of Open Source Software*, 2018. DOI: 10.21105/joss.00506. [OPEN ACCESS LINK](#)
- Moerman KM et al., **On the importance of 3D, geometrically accurate, and subject-specific finite element analysis for evaluation of in-vivo soft tissue loads**, *Comp. Meth. Biomech. Biomed. Engin.*, 2017. DOI: 10.1080/10255842.2016.1250259. [OPEN ACCESS LINK](#)
- Moerman KM et al., **Control of tension-compression asymmetry in Ogden hyperelasticity with application to soft tissue modelling**, *J.Mech.Behav.Biomed.Mater.*, 2016. DOI: 10.1016/j.jmbbm.2015.11.027. [OPEN ACCESS LINK](#)

## Editorial board experience

- 01/2020-Now **Academic Editor** [PLOS ONE](#)
- 04/2017-Now **Section Editor** [The Journal of Open Hardware](#)
- 06/2016-Now **EngrXiv co-founder, steering committee member** [EngrXiv: The Engineering Archive](#)
- 02/2016-Now **Co-founder, Associate Editor in Chief** [The Journal of Open-Source Software](#)

## Conference session and workshop organization

- 05/2023 **Organizer of workshop** [CMBBE 2023](#)
- 07/2022 **Organizer of special session and workshop** [ESMC 2022](#)
- 09/2021 **Organizer of workshop** [CMBBE 2021](#)
- 06/2021 **Organizer of workshop** [VPH 2021](#)
- 09/2019 **Organizer of special session and workshop** [CMBBE 2019](#)
- 07/2018 **Organizer of special session and workshop** [WCB 2018](#)
- 08/2017 **Organizer, host** [MozillaScience Working Open Workshop Boston](#)
- 09/2016 **Organizer, host** [Open Source Tools for Computational Biomechanics, IEEE Boston](#)
- 10/2014 **Committee member, organizer of special session and workshop** [CMBBE 2014](#)
- 07/2014 **Organizer/chair for special sessions** [World Congress of Biomechanics 2014](#)
- 04/2013 **Organizer/chair special session** [CMBBE 2013](#)

## Extra-curricular activities

- 2019 **Science outreach** [PubhD Galway](#)
- 2018-Now **Open Science MOOC content and website developer** [Open Science MOOC](#)
- 2017-Now **Developer of the Open Access Clinic website** [Open Access Clinic](#)

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## Published works

This section lists all scientific outputs which includes articles, pre-prints, data, software, hardware, and patents. The most up to date list can be found at my [ORCID](#) profile.

## Preprints

- [1] Shaiv Parikh, Kevin M. Moerman, Mitch J. F. G. Ramaekers, Simon Schalla, Elham Bidar, Tammo Delhaas, Koen Reesink, and Wouter Huberts. *Biomechanical characterisation of thoracic ascending aorta with preserved pre-stresses*. Pages: 2022.12.02.518810 Section: New Results. Dec. 3, 2022. DOI: [10.1101/2022.12.02.518810](https://doi.org/10.1101/2022.12.02.518810). URL: <https://www.biorxiv.org/content/10.1101/2022.12.02.518810v1> (visited on 06/29/2023).
- [2] Kevin Moerman, David Sengeh, and Hugh Herr. *Automated and Data-driven Computational Design of Patient-Specific Biomechanical Interfaces*. 2016. DOI: [10.17605/OSF.IO/G8H9N](https://doi.org/10.17605/OSF.IO/G8H9N). URL: <http://doi.org/10.17605/OSF.IO/G8H9N>.

## Journal articles

- [1] “Virtual Patient-Specific Thrombectomies: The Impact of the Vessel Morphology - European Journal of Vascular and Endovascular Surgery”. In: (). URL: [https://www.ejves.com/article/S1078-5884\(21\)00981-3/fulltext](https://www.ejves.com/article/S1078-5884(21)00981-3/fulltext) (visited on 06/29/2023).
- [2] M. Natividad Gomez-Cerezo, Nataliya Perevoshchikova, Rui Ruan, Kevin M. Moerman, Randy Bindra, David G. Lloyd, Ming Hao Zheng, David J. Saxby, and Cedryck Vaquette. “Additively manufactured polyethylene terephthalate scaffolds for scapholunate interosseous ligament reconstruction”. In: *Biomaterials Advances* 149 (June 1, 2023), p. 213397. ISSN: 2772-9508. DOI: [10.1016/j.bioadv.2023.213397](https://doi.org/10.1016/j.bioadv.2023.213397). URL: <https://www.sciencedirect.com/science/article/pii/S2772950823001206> (visited on 04/18/2023).
- [3] M. Natividad Gomez-Cerezo, Nataliya Perevoshchikova, Rui Ruan, Kevin M. Moerman, Randy Bindra, David G. Lloyd, Ming Hao Zheng, David J. Saxby, and Cedryck Vaquette. “Additively manufactured polyethylene terephthalate scaffolds for scapholunate interosseous ligament reconstruction”. In: *Biomaterials Advances* 149 (June 1, 2023), p. 213397. ISSN: 2772-9508. DOI: [10.1016/j.bioadv.2023.213397](https://doi.org/10.1016/j.bioadv.2023.213397). URL: <https://www.sciencedirect.com/science/article/pii/S2772950823001206> (visited on 06/29/2023).
- [4] Bryan J. Ranger, Kevin M. Moerman, Brian W. Anthony, and Hugh M. Herr. “Constitutive parameter identification of transtibial residual limb soft tissue using ultrasound indentation and shear wave elastography”. In: *Journal of the Mechanical Behavior of Biomedical Materials* 137 (Jan. 1, 2023), p. 105541. ISSN: 1751-6161. DOI: [10.1016/j.jmbbm.2022.105541](https://doi.org/10.1016/j.jmbbm.2022.105541). URL: <https://www.sciencedirect.com/science/article/pii/S1751616122004465> (visited on 06/29/2023).
- [5] Mahtab Vafaeefer, Kevin M. Moerman, Majid Kavousi, and Ted J. Vaughan. “A morphological, topological and mechanical investigation of gyroid, spinodoid and dual-lattice algorithms as structural models of trabecular bone”. In: *Journal of the Mechanical Behavior of Biomedical Materials* 138 (Feb. 1, 2023), p. 105584. ISSN: 1751-6161. DOI: [10.1016/j.jmbbm.2022.105584](https://doi.org/10.1016/j.jmbbm.2022.105584). URL: <https://www.sciencedirect.com/science/article/pii/S1751616122004891> (visited on 06/29/2023).
- [6] Kevin Mattheus Moerman, Praneeta Konduri, Behrooz Fereidoonhezad, Henk Marquering, Aad van der Lugt, Giulia Luraghi, Sara Bridio, Francesco Migliavacca, Jose Felix Rodriguez Matas, and Patrick McGarry. “Development of a Patient-Specific Cerebral Vasculature Fluid-Structure-Interaction Model”. In: *Journal of Biomechanics* (2022). DOI: [10.1016/j.jbiomech.2021.110896](https://doi.org/10.1016/j.jbiomech.2021.110896). URL: <https://doi.org/10.1016/j.jbiomech.2021.110896>.
- [7] Fergal B. Coulter, Ruth E. Levey, Scott T. Robinson, Eimear B. Dolan, Stefano Deotti, Michael Monaghan, Peter Dockery, Brian S. Coulter, Liam P. Burke, Aoife J. Lowery, Rachel Beatty, Ryan Paetzold, James J. Prendergast, Gabriella Bellavia, Stefania Straino, Francesca Cianfarani, Monica Salamone, Carmelo M. Bruno, Kevin M. Moerman, Giulio Gherzi, Garry P. Duffy, and Eoin D. O’Cearbhaill. “Additive Manufacturing of Multi-Scale Porous Soft Tissue Implants That Encourage Vascularization and Tissue Ingrowth”. In: *Advanced Healthcare Materials* 10.14 (2021), p. 2100229. ISSN: 2192-2659. DOI: [10.1002/adhm.202100229](https://doi.org/10.1002/adhm.202100229).



- [8] B. Fereidoon nezhad, K.M. Moerman, S. Johnson, R. McCarthy, and P.J. McGarry. "A new compressible hyperelastic model for the multi-axial deformation of blood clot occlusions in vessels". In: *Biomechanics and Modeling in Mechanobiology* (2021). DOI: [10.1007/s10237-021-01446-4](https://doi.org/10.1007/s10237-021-01446-4).
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- [10] Concannon J, Moerman KM, Hynes N, Sultan S, and McGarry JP. "Influence of shape-memory stent grafts on local aortic compliance." In: *Biomechanics and modeling in mechanobiology* (Dec. 2021). DOI: [10.1007/s10237-021-01514-9](https://doi.org/10.1007/s10237-021-01514-9).
- [11] Nataliya Perevoshchikova, Kevin Moerman, Bardiya Akhbari, Randy Bindra, Jayishni N. Maharaj, David G. Lloyd, Maria Gomez Cerezo, Amelia Carr, Cedryck Vaquette, and David J. Saxby. "Finite element analysis of the performance of additively manufactured scaffolds for scapholunate ligament reconstruction". In: *PLOS ONE* (2021). DOI: [10.1371/journal.pone.0256528](https://doi.org/10.1371/journal.pone.0256528). URL: <http://doi.org/10.1371/journal.pone.0256528>.
- [12] Georgakopoulou T, van der Wijk AE, Bakker ENTP, vanBavel E, and INSIST investigators. "Quantitative 3D analysis of tissue damage in a rat model of microembolization." In: *Journal of biomechanics* (Sept. 2021). DOI: [10.1016/j.jbiomech.2021.110723](https://doi.org/10.1016/j.jbiomech.2021.110723).
- [13] Concannon J, Hynes N, McMullen M, Smyth E, Moerman K, McHugh PE, Sultan S, Karmonik C, and McGarry JP. "A Dual-VENC Four-Dimensional Flow MRI Framework for Analysis of Subject-Specific Heterogeneous Nonlinear Vessel Deformation." In: *Journal of biomechanical engineering* (Nov. 2020). DOI: [10.1115/1.4048649](https://doi.org/10.1115/1.4048649).
- [14] Kevin M. Moerman, Behrooz Fereidoon nezhad, and J. Patrick McGarry. "Novel hyperelastic models for large volumetric deformations". In: *International Journal of Solids and Structures* 193-194 (June 2020), pp. 474–491. DOI: [10.1016/j.ijsolstr.2020.01.019](https://doi.org/10.1016/j.ijsolstr.2020.01.019). URL: <https://doi.org/10.1016/j.ijsolstr.2020.01.019>.
- [15] Ted J. Vaughan, Frank Kirrane, Kevin M. Moerman, Tara Cahill, Anthony O'Regan, and Derek T. O'Keeffe. "A Novel Dual Non-Invasive Ventilator Continuous Positive Airway Pressure Non-Aerosolization Circuit for Emergency Use in the COVID-19 Pandemic". In: *Journal of Open Hardware* 4.1 (2020). DOI: [10.5334/joh.23](https://doi.org/10.5334/joh.23). URL: <https://doi.org/10.5334/joh.23>.
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- [20] Kevin Moerman. "GIBBON: The Geometry and Image-Based Bioengineering add-On". In: *The Journal of Open Source Software* (2018). DOI: [10.21105/joss.00506](https://doi.org/10.21105/joss.00506). URL: <http://doi.org/10.21105/joss.00506>.
- [21] A.M. Smith, K.E. Niemeyer, D.S. Katz, L.A. Barba, G. Githinji, M. Gymrek, K.D. Huff, C.R. Madan, A.C. Mayes, K.M. Moerman, P. Prins, K. Ram, A. Rokem, T.K. Teal, R.V. Guimera, and J.T. Vanderplas. "Journal of Open Source Software (JOSS): Design and first-year review". In: *PeerJ Computer Science* 2018.2 (2018). DOI: [10.7717/peerj-cs.147](https://doi.org/10.7717/peerj-cs.147).
- [22] Dana Solav, Kevin M. Moerman, Aaron M. Jaeger, Katia Genovese, and Hugh M. Herr. "MultiDIC: An Open-Source Toolbox for Multi-View 3D Digital Image Correlation". In: *IEEE Access* 6 (2018), pp. 30520–30535. DOI: [10.1109/access.2018.2843725](https://doi.org/10.1109/access.2018.2843725). URL: <https://doi.org/10.1109/access.2018.2843725>.
- [23] Willeke A. Traa, Mark C. van Turnhout, Kevin M. Moerman, Jules L. Nelissen, Aart J. Nederveen, Gustav J. Strijkers, Dan L. Bader, and Cees W. J. Oomens. "MRI based 3D finite element modelling to investigate deep tissue injury". In: *Computer Methods in Biomechanics and Biomedical Engineering* (Nov. 2018), pp. 1–10. DOI: [10.1080/10255842.2018.1517868](https://doi.org/10.1080/10255842.2018.1517868). URL: <https://doi.org/10.1080/10255842.2018.1517868>.

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