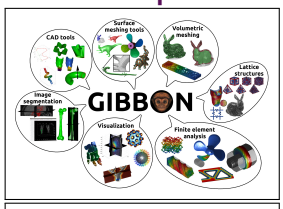
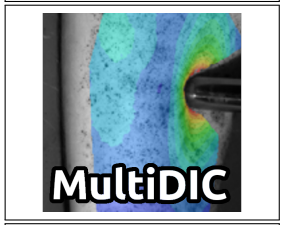
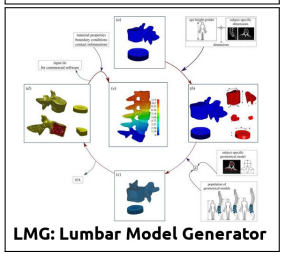
kevinmoerman.org

Software development







Programming

MATLAB ★★★★★
Octave ★★★★★
Julia ★★★★☆
Python ★★★☆☆
Arduino ★★★☆☆
Git/GitHub ★★★★☆
LaTeχ ★★★★★
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

30 Pairc na gCaor | H91P9PX Moycullen | Ireland | +353 876492484 | kevin.moerman@gmail.com

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.

01/2023-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. Computaional 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*

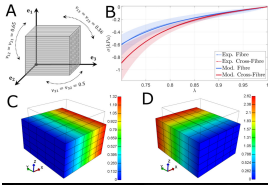
2000 - 2004 — **BEng in Mechanical Engineering** — The Hague University of Appl. Sciences, The Hague, NL
Major: *Product Design*. Final Project: *"The Design and Development of an Autonomic Solar Powered, Mobile Concentrate Feeding Robot for Cows"*.

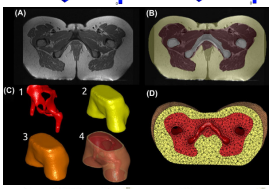
Patents

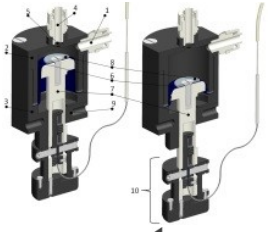
US20190021880A1

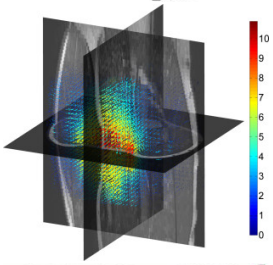
EP1683411

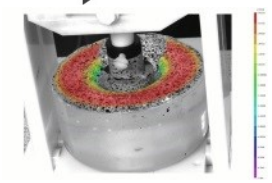
Publication figures











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. Framew. 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	Engrχiv 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

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. 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. 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 (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. 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. 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. URL: https://www.sciencedirect.com/science/article/pii/S1751616122004465 (visited on 06/29/2023).

[5] Mahtab Vafaeefar, 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. URL: https://www.sciencedirect.com/science/article/pii/S1751616122004891 (visited on 06/29/2023).

[6] Kevin Mattheus Moerman, Praneeta Konduri, Behrooz Fereidoonnezhad, 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. 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 Ghersi, 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.

[8] B. Fereidoonnezhad, 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.

[9] Luraghi G, Bridio S, Rodriguez Matas JF, Dubini G, Boodt N, Gijsen FJH, van der Lugt A, Fereidoonnezhad B, Moerman KM, McGarry P, Konduri PR, and INSIST investigators. “The first virtual patient-specific thrombectomy procedure.” In: *Journal of biomechanics* (Sept. 2021). DOI: 10.1016/j.jbiomech.2021.110622.

[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.

[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. 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.

[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.

[14] Kevin M. Moerman, Behrooz Fereidoonnezhad, 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. URL: https://doi.org/10.1016%2Fj.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. URL: https://doi.org/10.5334%2Fjoh.23.

[16] J. Concannon, P. Dockery, A. Black, S. Sultan, N. Hynes, P. E. McHugh, K. M. Moerman, and J. P. McGarry. “Quantification of the regional bioarchitecture in the human aorta”. In: *Journal of Anatomy* (Sept. 2019). DOI: 10.1111/joa.13076. URL: https://doi.org/10.1111%2Fjoa.13076.

[17] Bryan J. Ranger, Micha Feigin, Xiang Zhang, Kevin M. Moerman, Hugh Herr, and Brian W. Anthony. “3D ultrasound imaging of residual limbs with camera-based motion compensation”. In: *IEEE Transactions on Neural Systems and Rehabilitation Engineering* (2019), pp. 1–1. DOI: 10.1109/tnsre.2019.2894159. URL: https://doi.org/10.1109%2Ftnsre.2019.2894159.

[18] Dana Solav, Kevin M. Moerman, Aaron M. Jaeger, and Hugh Herr. “A framework for measuring the time-varying shape and full-field deformation of residual limbs using 3D digital image correlation”. In: *IEEE Transactions on Biomedical Engineering* (2019), pp. 1–1. DOI: 10.1109/tbme.2019.2895283. URL: https://doi.org/10.1109%2Ftbme.2019.2895283.

[19] C. E. Lavecchia, D. M. Espino, K. M. Moerman, K. M. Tse, D. Robinson, P. V. S. Lee, and D. E. T. Shepherd. “Lumbar model generator: a tool for the automated generation of a parametric scalable model of the lumbar spine”. In: *Journal of The Royal Society Interface* 15.138 (Jan. 2018), p. 20170829. DOI: 10.1098/rsif.2017.0829. URL: https://doi.org/10.1098%2Frsif.2017.0829.

[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. 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.

[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. URL: https://doi.org/10.1109%2Faccess.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. URL: https://doi.org/10.1080%2F10255842.2018.1517868.

[24] B. Lin, K.M. Moerman, C.G. McMahan, K.A. Pasch, and H.M. Herr. “Low-Cost Methodology for Skin Strain Measurement of a Flexed Biological Limb”. In: *IEEE Transactions on Biomedical Engineering* 64.12 (2017), pp. 2750–2759. DOI: 10.1109/tbme.2016.2626442.

[25] K.M. Moerman, M. van Vijven, L.R. Solis, E.E. van Haaften, A.C.Y. Loenen, V.K. Mushahwar, and C.W.J. Oomens. “On the importance of 3D, geometrically accurate, and subject-specific finite element analysis for evaluation of in-vivo soft tissue loads”. In: *Computer Methods in Biomechanics and Biomedical Engineering* 20.5 (2017), pp. 483–491. DOI: 10.1080/10255842.2016.1250259.

[26] J.L. Nelissen, L. De Graaf, W.A. Traa, T.J.L. Schreurs, K.M. Moerman, A.J. Nederveen, R. Sinkus, C.W.J. Oomens, K. Nicolay, and G.J. Strijkers. “A MRI-compatible combined mechanical loading and mr elastography setup to study deformation-induced skeletal muscle damage in rats”. In: *PLoS ONE* 12.1 (2017). DOI: 10.1371/journal.pone.0169864.

[27] K.M. Moerman, C.K. Simms, and T. Nagel. “Control of tension-compression asymmetry in Ogden hyperelasticity with application to soft tissue modelling”. In: *Journal of the Mechanical Behavior of Biomedical Materials* 56 (2016), pp. 218–228. DOI: 10.1016/j.jmbbm.2015.11.027.

[28] T. Nagel, U.-J. Görke, K.M. Moerman, and O. Kolditz. “On advantages of the Kelvin mapping in finite element implementations of deformation processes”. In: *Environmental Earth Sciences* 75.11 (2016). DOI: 10.1007/s12665-016-5429-4.

[29] D.M. Sengeh, K.M. Moerman, A. Petron, and H. Herr. “Multi-material 3-D viscoelastic model of a transtibial residuum from in-vivo indentation and MRI data”. In: *Journal of the Mechanical Behavior of Biomedical Materials* 59 (2016), pp. 379–392. DOI: 10.1016/j.jmbbm.2016.02.020.

[30] Kevin Moerman and. “Open source publishing to boost your career”. In: (2015). DOI: 10.15200/winn.144174.45345. URL: https://doi.org/10.15200%2Fwinn.144174.45345.

[31] G.M. Cooney, K.M. Moerman, M. Takaza, D.C. Winter, and C.K. Simms. “Uniaxial and biaxial mechanical properties of porcine linea alba”. In: *Journal of the Mechanical Behavior of Biomedical Materials* 41 (2015), pp. 68–82. DOI: 10.1016/j.jmbbm.2014.09.026.

[32] J. Gindre, M. Takaza, K.M. Moerman, and C.K. Simms. “A structural model of passive skeletal muscle shows two reinforcement processes in resisting deformation”. In: *Journal of the Mechanical Behavior of Biomedical Materials* 22 (2013), pp. 84–94. DOI: 10.1016/j.jmbbm.2013.02.007.

[33] K.M. Moerman, A.M.J. Sprengers, A.J. Nederveen, and C.K. Simms. “A novel MRI compatible soft tissue indentor and fibre Bragg grating force sensor”. In: *Medical Engineering and Physics* 35.4 (2013), pp. 486–499. DOI: 10.1016/j.medengphy.2012.06.014.

[34] A.M.J. Sprengers, M.W.A. Caan, K.M. Moerman, A.J. Nederveen, R.M. Lamerichs, and J. Stoker. “A scale space based algorithm for automated segmentation of single shot tagged MRI of shearing deformation”. In: *Magnetic Resonance Materials in Physics, Biology and Medicine* 26.2 (2013), pp. 229–238. DOI: 10.1007/s10334-012-0332-9.

[35] M. Takaza, K.M. Moerman, J. Gindre, G. Lyons, and C.K. Simms. “The anisotropic mechanical behaviour of passive skeletal muscle tissue subjected to large tensile strain”. In: *Journal of the Mechanical Behavior of Biomedical Materials* 17 (2013), pp. 209–220. DOI: 10.1016/j.jmbbm.2012.09.001.

[36] M. Takaza, K.M. Moerman, and C.K. Simms. “Passive skeletal muscle response to impact loading: Experimental testing and inverse modelling”. In: *Journal of the Mechanical Behavior of Biomedical Materials* 27 (2013), pp. 214–225. DOI: 10.1016/j.jmbbm.2013.04.016.

[37] K.M. Moerman, A.M.J. Sprengers, C.K. Simms, R.M. Lamerichs, J. Stoker, and A.J. Nederveen. “Validation of continuously tagged MRI for the measurement of dynamic 3D skeletal muscle tissue deformation”. In: *Medical Physics* 39.4 (2012), pp. 1793–1810. DOI: 10.1118/1.3685579.

[38] K.M. Moerman, A.M.J. Sprengers, C.K. Simms, R.M. Lamerichs, J. Stoker, and A.J. Nederveen. “Validation of SPAMM tagged MRI based measurement of 3D soft tissue deformation”. In: *Medical Physics* 38.3 (2011), pp. 1248–1260. DOI: 10.1118/1.3533942.

[39] C. Lally, V. Flamini, C. Kerskens, K.M. Moerman, and C.K. Simms. “Imaging arterial fibres using diffusion tensor imaging-feasibility study and preliminary results”. In: *Eurasip Journal on Advances in Signal Processing* 2010 (2010). DOI: 10.1155/2010/904091.

[40] K.M. Moerman, C.M. Kerskens, C. Lally, V. Flamini, and C.K. Simms. “Evaluation of a validation method for MR imaging-based motion tracking using image simulation”. In: *Eurasip Journal on Advances in Signal Processing* 2010 (2010). DOI: 10.1155/2010/942131.

[41] K.M. Moerman, C.A. Holt, S.L. Evans, and C.K. Simms. “Digital image correlation and finite element modelling as a method to determine mechanical properties of human soft tissue in vivo”. In: *Journal of Biomechanics* 42.8 (2009), pp. 1150–1153. DOI: 10.1016/j.jbiomech.2009.02.016.

Software/hardware/data

[1] Ted Vaughan, Frank Kirrane, Kevin Mattheus Moerman, Tara Cahill, Anthony O’Regan, and Derek O’Keeffe. *3DNIV/3DNIV: Development of a Dual Non-Invasive Ventilator Continuous Positive Airway Pressure (CPAP) Circuit for Emergency Use in the COVID19 Pandemic using 3D Printed*

Components. 2020. DOI: 10.5281/zenodo.3818305. URL: http://doi.org/10.5281/zenodo.3818305.
[2] Kevin Moerman, Kevin Moerman, Bryan Ranger, and Hugh Herr. *Socket Evaluation Questionnaire*. 2016. DOI: 10.5281/ZENODO.61310. URL: http://doi.org/10.5281/ZENODO.61310.
[3] Kevin Moerman and Kevin Mattheus Moerman. *GIBBON (Hylobates Lar)*. 2016. DOI: 10.5281/ZENODO.44404. URL: http://doi.org/10.5281/ZENODO.44404.
[4] Kevin Mattheus Moerman. *GIBBON (Hylobates Agilis)*. Oct. 2014. DOI: 10.5281/zenodo.12214. URL: http://zenodo.org/record/12214.

Patents

[1] HERR HUGH M, MOERMAN KEVIN MATTHEUS, SOLAV DANA, RANGER BRYAN JAMES, STEINMEYER REBECCA, KU STEPHANIE LAI, DAGDEVIREN CANAN, CARNEY MATTHEW, PRIETO-GOMEZ GERMAN A, ZHANG XIANG, FINCKE JONATHAN RANDALL, FEIGIN-ALMON MICHA, ANTHONY PH D BRIAN W, LIU ZIXI, JAEGER AARON, and YANG XINGBANG. "Quantitative Design And Manufacturing Framework For A Biomechanical Interface Contacting A Biological Body Segment". Patent Application US 2021/0145608 A1 (United States). May 20, 2021. URL: https://lens.org/195-131-697-230-254.
[2] HERR HUGH M, MOERMAN KEVIN MATTHEUS, and SENGEH DAVID MOININA. "METHOD AND SYSTEM FOR DESIGNING A BIOMECHANICAL INTERFACE CONTACTING A BIOLOGICAL BODY SEGMENT". Patent Application WO 2017/123729 A1 (World Intellectual Property Organization). July 20, 2017. URL: https://lens.org/155-940-131-489-338.
[3] VAN DEN BERG KAREL, STEEN GEERT CORNELIS, and MATTHEUS MOERMAN KEVIN. "A mobile animal feeding installation with feed metering device". Patent Application NZ544606. 2006. URL: http://europepmc.org/patents/pat/NZ544606.
[4] STEEN GEERT CORNELIS, BERG KAREL VAN DEN, and MOERMAN KEVIN MATTEUS. "A feeding installation". AU2005101010. 2005. URL: http://europepmc.org/patents/pat/AU2005101010.

Conference abstracts

[1] Kevin Moerman. "A FRAMEWORK FOR AUTOMATED FACEMASK DESIGN AND TISSUE LOAD EVALUATION". In: *the 27th Bioengineering in Ireland Conference, Royal Academy of Medicine Ireland* (2022).
[2] Kevin Moerman, Behrooz Fereidoonnezhad, and Patrick McGarry. "A Highly Automated Framework for Cerebral Vasculature and Thrombus Fluid-Structure Interaction Modelling". In: *The 11th European Solid Mechanics Conference* (2022).
[3] Kevin Moerman. "COMPUTATIONAL FRAMEWORKS FOR THE DESIGN AND EVALUATION OF MEDICAL DEVICES AND MEDICAL PROCEDURES". In: *the 26th Bioengineering in Ireland Conference, Royal Academy of Medicine Ireland* (2020).
[4] Behrooz Fereidoonnezhad, Kevin Moerman, and Patrick McGarry. "Role of fibrin fibers on the fracture properties of thrombus". In: *The 16th International Symposium: Computer Methods in Biomechanics and Biomedical Engineering* (2019).
[5] Kevin Moerman, Behrooz Fereidoonnezhad, and Patrick McGarry. "COMPUTATIONAL TOOLS FOR IN-SILICO TRIALS OF MECHANICAL TROMBECTOMY". In: *the 24th Bioengineering in Ireland Conference, Royal Academy of Medicine Ireland* (2018).
[6] K.M. Moerman, D. Solav, and Herr H.M. "Porous Lattice Structures for the Creation of Breathable and Compliant Biomechanical Interfaces". In: *ICMOBT 2017: The international conference on the mechanics of biomaterials and tissues* (2017).
[7] B. Ranger, B.W. Anthony, Herr H.M., and K.M. Moerman. "Indentation and inverse FEA based soft tissue constitutive parameter identification: simplified versus anatomically accurate model geometries". In: *EUROMECH Colloquium 585: Advanced experimental methods in tissue biomechanics* (2017).
[8] K.M. Moerman, A.J. Nederveen, M. Froeling, and C.K Simms. "Analysis of the Non-linear Elastic and Anisotropic Behaviour of Skeletal Muscle Tissue: Challenges in Constitutive Modelling and In-vivo Validation". In: *The 12th International Symposium: Computer Methods in Biomechanics and Biomedical Engineering* (2014).
[9] K.M. Moerman, A.J. Nederveen, M. Froeling, and C.K Simms. "In-Vivo Calf Muscle Passive Elastic Behaviour Analysis Based on Inverse FEA and Detailed MRI Derived Boundary Conditions". In: *The 7th World Congress of Biomechanics* (2014).
[10] K.M. Moerman, A.J. Nederveen, S.K. Evans, and C.K Simms. "INVERSE ANALYSIS OF SKELETAL MUSCLE TISSUE BASED ON MRI DERIVED 3D GEOMETRY, DEFORMATION AND FIBRE ARCHITECTURE". In: *The 11th International Symposium: Computer Methods in Biomechanics and Biomedical Engineering* (2013).

[11] K.M. Moerman, A.J. Nederveen, and C.K Simms. “IMAGE BASED MODEL CONSTRUCTION, BOUNDARY CONDITION SPECIFICATION AND INVERSE FEA CONTROL: A BASIC MATLAB TOOLKIT FOR FEBIO”. In: *The 11th International Symposium: Computer Methods in Biomechanics and Biomedical Engineering* (2013).

[12] Juliette Gindre, Michael Takaza, Kevin M Moerman, and Ciaran K Simms. “A MICRO-STRUCTURAL MUSCLE FIBRE MODEL SHOWS TENSION-COMPRESSION ASYMMETRY MECHANISMS”. In: *Journal of Biomechanics, 18th Congress of the European Society of Biomechanics* 45 (July 2012), S572. DOI: 10.1016/s0021-9290(12)70573-0. URL: https://doi.org/10.1016%2Fs0021-9290%2812%2970573-0.

[13] Kevin M. Moerman, Thomas Nagel, Michael Takaza, Aart Nederveen, and Ciaran K. Simms. “CONSTITUTIVE MODELLING OF PASSIVE SKELETAL MUSCLE ANISOTROPY IN TENSION AND COMPRESSION”. In: *Journal of Biomechanics, 18th Congress of the European Society of Biomechanics* 45 (July 2012), S487. DOI: 10.1016/s0021-9290(12)70488-8. URL: https://doi.org/10.1016%2Fs0021-9290%2812%2970488-8.

[14] Kevin M. Moerman, Andre Sprengers, Aart Nederveen, and Ciaran K. Simms. “NON-INVASIVE ANALYSIS OF THE MECHANICAL PROPERTIES OF SKELETAL MUSCLE TISSUE IN-VIVO”. In: *Journal of Biomechanics, 18th Congress of the European Society of Biomechanics* 45 (July 2012), S488. DOI: 10.1016/s0021-9290(12)70489-x. URL: https://doi.org/10.1016%2Fs0021-9290%2812%2970489-x.

[15] K.M. Moerman, A.J. Nederveen, A.M. Sprengers, R.M. Lamerichs, and C.K Simms. “Non-Invasive Determination of the Anisotropic and Viscoelastic Mechanical Properties of Living Human Skeletal Muscle Tissue”. In: *the 17th Bioengineering in Ireland Conference, Royal Academy of Medicine Ireland* (2011).

[16] K.M. Moerman, A.M. Sprengers, A.J. Nederveen, M. Froeling, R. M. Lamerichs, and C.K Simms. “TOWARDS THE NON-INVASIVE DETERMINATION OF THE ANISOTROPIC AND VISCOELASTIC MECHANICAL PROPERTIES OF LIVING HUMAN SKELETAL MUSCLE TISSUE”. In: *The XXIIIrd Congress of the International Society of Biomechanic* (2011).

[17] K.M. Moerman, A.M. Sprengers, C.K Simms, A. E. Bohte, R. M. Lamerichs, Sinkus R., and A.J. Nederveen. “Combined MRE and SPAMM tagged MRI for the analysis of large strain soft tissue mechanical properties”. In: *2011 Annual Meeting, International Society for Magnetic Resonance in Medicine* (2011).

[18] K.M. Moerman, A.M. Sprengers, C.K Simms, J. Stoker, and A.J. Nederveen. “Validation of Fast Dynamic SPAMM Tagged MRI Based Measurement of Non-linear 3D Soft Tissue Deformation”. In: *2011 Annual Meeting, International Society for Magnetic Resonance in Medicine* (2011).

[19] K.M. Moerman, A.J. Nederveen, A.M. Sprengers, C.A. Holt, S.L. Evans, C. Lally, and C.K Simms. “Non-Invasive Imaging and Inverse Finite Element Analysis for the Determination of the Mechanical Properties of Soft Tissue”. In: *The 9th International Symposium: Computer Methods in Biomechanics and Biomedical Engineering* (2010).

[20] K.M. Moerman, A.J. Nederveen, A.M. Sprengers, and C.K Simms. “TOWARDS THE NON-INVASIVE DETERMINATION OF THE MECHANICAL PROPERTIES OF LIVING HUMAN SOFT TISSUE”. In: *The 16th Bioengineering in Ireland Conference, Royal Academy of Medicine Ireland* (2010).

[21] K.M. Moerman, C.K Simms, A.M. Sprengers, J. Stoker, and A.J. Nederveen. “Experimental Validation of SPAMM Tagged Magnetic Resonance Imaging Based Measurement of Non-uniform 3D Soft Tissue Deformation”. In: *2010 Benelux chapter meeting, International Society for Magnetic Resonance in Medicine* (2010).

[22] K.M. Moerman, C.K Simms, A.M. Sprengers, J. Stoker, and A.J. Nederveen. “Experimental Validation of SPAMM Tagged Magnetic Resonance Imaging Based Measurement of Non-uniform 3D Soft Tissue Deformation”. In: *2010 Annual Meeting, International Society for Magnetic Resonance in Medicine* (2010).

[23] K.M. Moerman, A.M.J. Sprengers, A.J. Nederveen, and C.K. Simms. “Passive human muscle properties for finite element human body models for safety”. In: *International Research Council on the Biomechanics of Injury - 2010 International IRCOBI Conference on the Biomechanics of Injury, Proceedings* (2010), pp. 281–284. URL: https://trid.trb.org/view/1104946.

[24] Kevin M. Moerman, Andre Sprengers, Aart Nederveen, and Ciaran K. Simms. “Real-time and Simultaneous Measurement of Non-Linear 3D Soft Tissue Deformation and Force: Application to Indentation Tests on the Human Upper Arm”. In: *17th Congress of the European Society of Biomechanics* (2010).

[25] Kevin M. Moerman, Christian M. Kerskens, Caitríona Lally, and Ciaran K. Simms. “A VALIDATION METHOD FOR MOTION TRACKING TECHNIQUES BASED ON TAGGED MAGNETIC RESONANCE IMAGING”. In: *The 15th Bioengineering in Ireland Conference, Royal Academy of Medicine Ireland* (2009).

[26] Kevin M. Moerman, Caitríona Lally, and Ciaran K. Simms. “A 3D Image Object tracking Algorithm Based on Sparse Masking and Adjacency Analysis”. In: *The 10th United States National Congress on Computational Mechanics* (2009).

[27] Kevin M. Moerman, Ciaran K. Simms, and Christian M. Kerskens. “Non-invasive determination of soft tissue deformation using tagged MRI: application to a silicone phantom”. In: *The 14th Bioengineering in Ireland Conference, Royal Academy of Medicine Ireland* (2008).