



# Kevin Mattheus Moerman

## Biomechanical & Design Engineer

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[kevinmoerman.org](http://kevinmoerman.org)



### Open-source projects



### GIBBON

The Geometry and Image-Based Bioengineering add-on

### Programming

MATLAB ★★★★★

LABVIEW ★★★★★

Python ★★★★★

Julia ★★★★★

### CAD & FEA

FEBio ★★★★★

ABAQUS ★★★★★

PTC/Creo ★★★★★

SolidWorks ★★★★★

### Robotics Design



### References

Dr. Ciaran Simms

Dr. Aart Nederveen

Prof. Hugh Herr

## Experience

April. 17 - Now

### Research Scientist

Biomechatronics, MIT Media Lab, Cambridge, MA, USA

As Research Scientist I lead the research into the design and development of novel biomechanical interfaces (such as prosthetic sockets) and co-supervise PhD students and undergraduate researchers.

Sept. 15 - April. 17

### Post Doctoral Associate

Biomechatronics, MIT Media Lab, Cambridge, MA, USA

The development of a framework for the automated design and optimization of patient-specific, 3D printable prosthetic sockets. Act as *Program Manager Mechanical Interfaces* I co-supervise PhD students and undergraduate researchers.

April 13 - Now

### Visiting Research Fellow

University of Dublin, Trinity College, Dublin, Ireland

A collaborative position through which I advise researchers on soft tissue biomechanics and teach them to use GIBBON for inverse finite element analysis.

Jan. 15 - Sept. 15

### 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.

2011 - 2015

### Post Doctoral Research Fellow

Academic Medical Centre, Amsterdam, The Netherlands

Development of novel methods for understanding and early detection of pressure ulcer development based on Magnetic Resonance Elastography, SPAMM tagged MRI and inverse finite element analysis.

2006 - 2008

### Teaching Assistant

University of Dublin, Trinity College, Dublin, Ireland

Part-time teaching assistant position (during PhD) on MATLAB for undergraduate mechanical engineering students.

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

May. 17 - June 17

### Kaufman Teaching Certificate Program

MIT, Cambridge, USA

Jan. 13 - April 13

### Course: Advanced MR Physics

Universiteit Utrecht, Utrecht, The Netherlands

Aug. 06 - Feb. 12

### PhD in Bioengineering

University of Dublin, Trinity College, Dublin, Ireland

Thesis: *An Improved Framework for the Inverse Analysis of Skeletal Muscle Tissue In-vivo*. Non-invasive assessment of the mechanical properties of skeletal muscle in-vivo based on dynamic MRI and inverse finite element analysis.

Aug. 08 - Aug. 09

### Postgraduate Diploma in Statistics

University of Dublin, Trinity College, Dublin, Ireland

Sep. 06

### 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

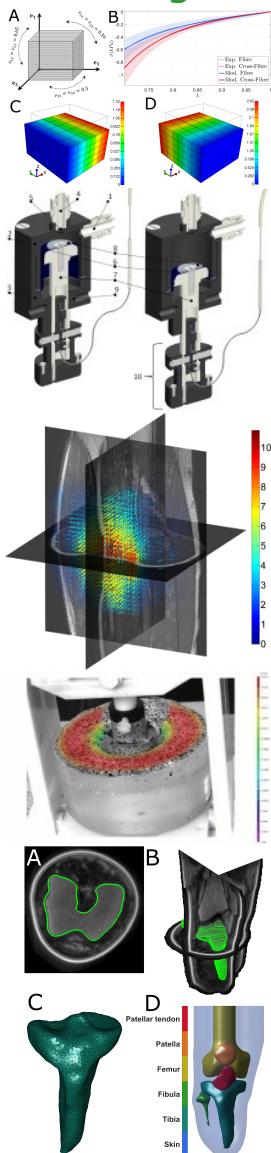
Major: Product Design. Final Project: *"The Design and Development of an Autonomous Solar Powered, Mobile Concentrate Feeding Robot for Cows"*.

## Patents



A feeding installation:  
EP1683411,  
AU2005101010,  
NZ544606,  
NL1028069,  
NL1029454

## Publication figures



## Awards

2010

### Engineers Ireland Biomedical Research Medal 2010

Engineers Ireland

Awarded at the 16th Annual Bioengineering in Ireland Conference. Paper: *Towards the Non-Invasive Determination of the Mechanical Properties of Living Human Soft Tissue.*

2009

### Bioengineering in Ireland Bronze Medal

Royal Academy of Medicine Ireland

1st Prize for best overall paper at the 15th Bioengineering in Ireland Conference, awarded by the Royal Academy of Medicine Ireland. Paper: *A validation method for motion tracking techniques based on tagged MRI.*

2005

### KIVI Dutch Bachelor Thesis Prize

The Royal Netherlands Society of Engineers, KIVI

The 3rd prize for best Dutch bachelor thesis. Thesis: *The Design and Development of Autonomic Solar Powered, Mobile Concentrate Feeding Robot for the Australian Dairy Industry.*

2004

### VSBfonds international student scholarship

VSBfonds

€ 7000 Scholarship for education or research outside the Netherlands. Awarded to a single shortlisted candidate per university by the VSBfonds organisation.

## Selected publications

Full list →

- Moerman KM, Simms CK, Nagel T. **Control of tension-compression asymmetry in Ogden hyperelasticity with application to soft tissue modelling** *J Mech Behav Biomed Mater.* 2016;56:218–28.
- Moerman KM, Sprengers AMJ, Nederveen AJ, Simms CK. **A novel MRI compatible soft tissue indentor and fibre Bragg grating force sensor** *Med Eng Phys.* 2013; (4):486–99.
- Moerman KM, Sprengers AMJ, Simms CK, Lamerichs RM, Stoker J, Nederveen AJ. **Validation of continuously tagged MRI for the measurement of dynamic 3D skeletal muscle tissue deformation** *Medical Physics.* 2012; 39(4):1793.
- Moerman KM, Holt CA, Evans SL, Simms CK. **Digital image correlation and finite element modelling as a method to determine mechanical properties of human soft tissue in vivo** *Journal of Biomechanics* 2009; 42(8):1150–3.

## Conference and editorial board experience

April 2017-Now

### Section Editor: Hardware metapapers

The Journal of Open Hardware

June 2016-Now

### Steering committee member

EngrXiv: The Engineering Archive

March 2016-Now

### Editorial board member

The Journal of Open-Engineering

Feb 2016-Now

### Editorial board member, co-founder

The Journal of Open-Source Software

Dec 2015-Now

### Subject Editor

The RIO Journal

2014

### Organizer/chair for special sessions

World Congress of Biomechanics 2014

2014

### Committee member, chair special sessions, workshop

CMBBE 2014

2013

### Organizer/chair for special session

CMBBE 2013

## Extra-curricular activities

2014-2015

### Youth Judo instructor

Baambrugge, Netherlands

2008-2009

### Vice-Captain

Dublin University Judo Club

2007-2009

### Travel Officer

Dublin University Photography Association

2007-2009

### Ju-Jutsu Instructor

Dublin University Judo Club

## Languages

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