

# Curriculum vitae of prof. Luca Cristofolini

## Personal information

Family name, First name: **Cristofolini Luca**

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[ResearcherID: C-4402-2013](#)  
[Scopus Author ID: 7006306058](#)

Date of birth: **29 December 1967** Nationality: **Italian**

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## Education

1996 PhD *Biomedical Engineering*, Univ. of Bologna (award: best PhD thesis in Bioeng. in Italy 1996-97)

1992 Master in *Mechanical engineering* (Summa cum Laude), University of Bologna, Italy

## Current position

2012– Full Professor of Biomechanics, School of Engineering and Architecture, University of Bologna

## Previous positions

1996–2013 Research Coordinator, Lab. for Technology of Materials, Rizzoli Orthopaedic Institute, Bologna

2004–2012 Assoc. Professor of Biomechanics, School of Engineering and Architecture, Univ. of Bologna

1995–2004 Research assistant in Experimental Mechanics, Dept. Mech. Engineering, Univ. of Bologna

## Scientific profile

Thanks to my inter-disciplinary background (Master in Mechanical Eng., PhD in Bioengineering) I always joined research (experimental mechanics, at UNIBO) and clinical application (Rizzoli Orthopaedic Institute). *I am acknowledged in the biomechanics community as an expert of in vitro tests, finite element models, and combining the two approaches to investigate basic and applied skeletal problems.* I am often called to develop quantitative validation of numerical models (international collaborations). I developed original methods to investigate bone competence implementing a multi-scale strategy. I am frequently invited to give keynotes and seminars on to the combined use of numerical models and *in vitro* experiments in orthopaedic biomechanics. Nine of my papers had over 200 citations (Google Scholar, 1 sept 18); for example:

- “ISB recommendation on definitions of joint coordinate system...” *JBiomech* 2002;35:543-48 **1679 cit**
- “Mechanical validation of composite femur models” *J Biomech* 1996;29:525-35 **528 cit**
- “Subject-specific FE models of bones: *in vitro* evaluation of the accuracy” *JBiomech* 2006:2457-67 **265cit**
- “The material mapping strategy influences the accuracy of CT-based FE models...” *Med Eng & Phys.* 2007;29:973-9 **207 citations (top 10 cited papers of MEP 2006-08)**

## Supervision of graduate students and postdoctoral fellows

2017– Founder and Board of the Doctorate in Health and Technology at University of Bologna

2005– Co-supervisor or examiner for 15 PhD students worldwide (Europe, USA, Canada, Australia).

2004– Mentored more than 30 PhD students and 20 post-docs, including 10 non-Italian researchers

1998– Supervised over 120 undergraduate and graduate students (including 35 Erasmus)

## Teaching activities (main)

2003– *Mechanics of living tissues*, Graduate students in Mech. and Biomed. Eng., Univ. of Bologna

2009–2013 *Experimental stress analysis*, Graduate students, Mechanical Engineering, Univ. of Bologna.

1998– *Mechanics of materials and structures*, undergrad students Biomed. Eng., Univ. of Bologna.

1994–1999 Labs on *Experimental stress analysis*, graduate students Mech. Engng., Univ. of Bologna.

## Invited lectures and courses (selection)

2016 *University of Reykjavik*: Invited lecture

2015 *University of Sheffield*: Invited seminar

2014 *Flinders University*, Adelaide: Invited Lecture

2013 *Combined Meeting of Orthopaedic Research Societies (CORS, Venice)*: invited lecture

2013 *26<sup>th</sup> Congress of International Society for Technology in Arthroplasty (ISTA, Palm Beach)*: keynote

- 2013 *University of Clemson (USA)*. Invited lecture
- 2012 *University of Sheffield*: Invited lecture
- 2011 *Instn.Mech.Eng. + Royal Coll.Surgeons* “Engineers & Surgeons Joined at the hip” London: keynote
- 2010 *17<sup>th</sup> European Society of Biomechanics Congress*, Edinburgh: instructional course
- 2010 *Accademia delle Scienze dell’Istituto di Bologna*: invited lecture
- 2009 *OTC Foundation*, Cambridge: invited lecture
- 2005 *University of Reykjavik*: one-week course “Mechanical properties of biological tissues”, MSc and PhD students in bioengineering

### Institutional responsibilities

- 2012– Director of Biomechanics Group, Dept. of Industrial Engineering, University of Bologna
- 2009– Chair of Board for stages and traineeships of students in Biomedical Eng., Univ. of Bologna
- 2007– Chair of Board for individual study careers of students in Biomedical Eng., Univ. of Bologna
- 2005–2015 International liaisons for PhD program in Bioengineering, University of Bologna
- 2004– Faculty member, School of Engineering and Architecture, University of Bologna

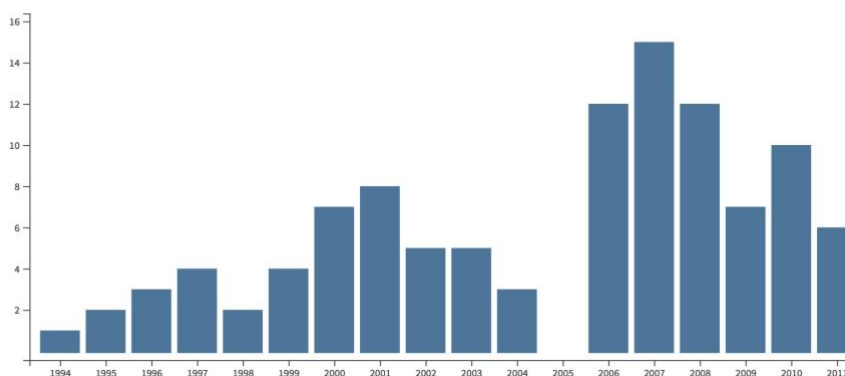
### Commissions of trust (selection)

- 2014–2016 *Riga Technical Univ. (Latvia)* Scientific Advisor for “Research Programme 2016–2020”
- 2014– *Swiss National Science Foundation (SNSF)*: Evaluator of proposals
- 2014– *Norway Grants*: Evaluator of proposals
- 2014– *FNRS + FWO + Université Libre de Bruxelles (Belgium)*: Evaluator of proposals
- 2011–2014 *Medical Research Scotland*: Evaluator of proposals
- 2009–2013 *Organisation for Health Research and Development (ZonMw, The Netherlands)*: Evaluator
- 2009– *Wellcome Trust + Leverhulme Trust (UK)*: Evaluator of proposals
- 2009– *Grantová Agentura České Republiky (Czech Science Foundation)*: Evaluator of proposals
- 2008– *European Commission (FP6, FP7, H2020)*: expert
- 2006– *Italian Ministry of University and Research (MIUR)*: Evaluator of proposals
- 2001–2002 *Internat.Soc.Biomech. (ISB)*: committee “Definition of coordinate systems”
- 1997–2001 *Internat.Standards Organiz., Tech. Comm. ISO/TC150* “Implants for surgery”: scientific advisor

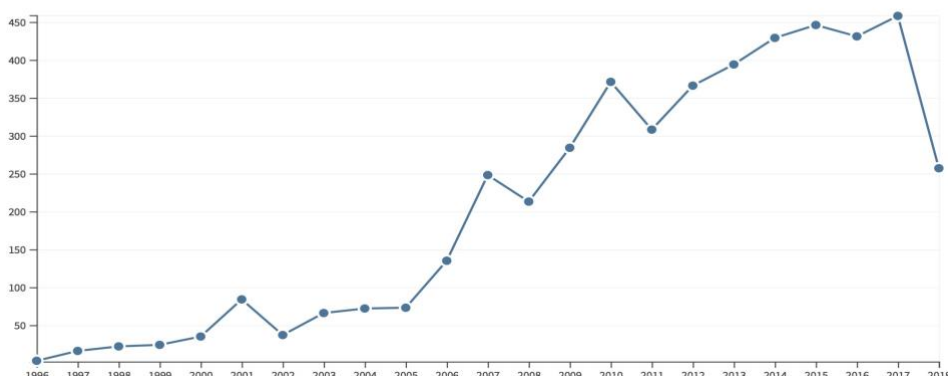
### Bibliometric indicators

Total Publications

**141** Analyze



Sum of Times Cited per Year



Scientific production and impact of Luca Cristofolini (Web of Science Core Collection interrogated 1<sup>st</sup> Nov 2017)

I co-authored a total of **141 journal** and **375 conference papers** (international, peer-reviewed). In the last 10 years I published: **118 journal** and **178 conference papers**. Impact indicators (1<sup>st</sup> September 2018):

- **Google Scholar:** 8380 Citations h-index=42 i10index=107
- **Thomson Reuters (WoS):** 4772 citations h-index=32

With a ResearchGate score of 41.29 I am in the top 2.5 percentile **worldwide for scientific impact** ([https://www.researchgate.net/profile/Luca\\_Cristofolini](https://www.researchgate.net/profile/Luca_Cristofolini)). Our paper “3D local measurements of bone strain: comparison of digital volume correlation approaches”, *Editors’ 2015 choice paper of ASME J Biomech Eng.*

### Top 10 publications (Citations: GoogleScholar 30aug16)

1. Tozzi G, Dall’Ara E, Palanca M, Curto M, Cristofolini L (2017) “Strain uncertainties from two digital volume correlation approaches in augmented vertebrae:” *JMBBM* 67, 117-126 **Journal IF3.239; paper cit 13**
2. Cristofolini L (2015) “*In vitro* evidence of the structural optimization of the human skeletal bones” *J Biomech* 48:787-96. **Invited paper. Journal IF2.431, paper cit. 18**
3. Lionello G, Cristofolini L (2014) “A practical approach to optimizing the preparation of speckle patterns for digital-image correlation” *Meas Sci Tech* 25:107001 (9 pag). **Journal IF1.492; paper cit. 42**
4. Cristofolini L, Brandolini N, Juszczak M, Erani P, Viceconti M (2013) “Strain distribution in the lumbar vertebrae under different load configurations” *The Spine J* 13:1281-92. **Journal IF2.660; paper cit. 26**
5. Cristofolini L, Conti G, Juszczak M, Van Sint Jan S, Viceconti M (2010) “Structural behaviour and strain distribution of the long bones of the lower limbs” *J Biomech* 43:826-35. **Journal IF2.431; paper cit. 46**
6. Cristofolini L, Schileo E, Juszczak M, Taddei F, Martelli S, Viceconti M (2010) “Mechanical testing of bones: the positive synergy of FE models and *in vitro* experiments” *Philos Transact A Math Phys Eng Sci* 368: 2725-63. **Journal IF2.864 (first scientific Journal, founded in 1660 by Francis Bacon); paper cit. 71**
7. Cristofolini L, Taddei F, Stea S, Viceconti M (2008) “Multiscale investigation of the functional properties of the human femur” *Philos Transact A Math Phys Eng Sci* 366:3319-41. **Journal IF2.864; paper cit. 46**
8. Cristofolini L, Juszczak M, Martelli S, Taddei F, Viceconti M (2007) “*In vitro* replication of spontaneous fractures of the proximal human femur” *J Biomech* 40 2837-2845. **Journal IF2.431; paper cit. 88**
9. Cristofolini L, Saponara Teutonico A, Savigni P, Erani P, Viceconti M (2007) “Preclinical assessment of the long-term endurance of cemented hip stems. Part 1: effect of daily activities” + “...Part 2: *in-vitro* and *ex-vivo* fatigue damage” *Proc Inst Mech Eng [H]* 221:569-584+585-599. **Journal IF0.996; total cit. 66**
10. Viceconti M, Brusi G, Pancanti A, Cristofolini L (2006) “Primary stability of an anatomical cementless hip stem: a statistical analysis” *J Biomech* 39:1169-79. **Journal IF2.431; paper cit. 120**

### Research monographs i co-authored in the last 10 years

1. Freddi A, Olmi G, Cristofolini L (2015) “Experimental Stress Analysis for Materials and Structures” **Springer Series in Solid & Structural Mechanics, 498 pages.**
2. Cristofolini L and 54 others, in alphabetical order (2013). *Roadmap for the digital patient - Discipulus*. Print and Design Solutions, University of Sheffield, 128 pages.

### Chapters in collective volumes in the last 10 years (Selection out of 15)

1. Cristofolini L (2012) “Anatomical reference frames for long bones: biomechanical applications” in: Preedy VR (Ed.), *Handbook of Anthropometry: Physical Measures of Human Form*. **Springer.**
2. Cristofolini L (2015) “Applications in Orthopaedics” in: *UNESCO Encyclopedia of Life Support Systems (EOLSS), Section 6.161A. Biomechanics, EOLSS, Paris.*
3. Cristofolini L (2015) “Validation of Finite Element Models” in: Augat P., Simpson H. (Eds.), *Experimental Research Methods in Orthopaedics*. **OTC Foundation Publications. Thieme Verlag**

### Granted patents

European pat. EP02425761.0 “Apparatus to measure intraoperatively the stability of orthopaedic prostheses”

### Invited keynotes to peer-reviewed international conferences / advanced schools (Selection: 14 of 55)

- 2018 1<sup>st</sup> International Conference on Materials, Mimicking, Manufacturing for Bio Application (BioM&M): plenary keynote
- 2018 10<sup>th</sup> European Solid Mechanics Conference (ESMC): invited Lecture
- 2017 33<sup>rd</sup> Annual Meeting of the Orthopaedic Trauma Association (OTA), Vancouver: invited Lecture

2016: *Europ. Orthop. Res. Soc. (EORS)* symposium “Integration of numerical and experimental approach”  
 2016: *University of Reykjavik*, Seminars on Biomaterials: keynote  
 2015: *Univ. of Sheffield*, invited lecture “Combined experimental approach to investigate the vertebrae”  
 2015: *5<sup>th</sup> Avicenna Event*, Barcelona: keynote  
 2014: *Flinders University Orthopaedic Workshop*, Adelaide: keynote  
 2014: *7<sup>th</sup> World Cong. Biomechanics*, Boston: invited talk “Synergic use of numerical and in vitro models”  
 2013: *8<sup>th</sup> Combined Orthop. Res. Soc. (CORS)*, Venice: symposium “Multiscale Biomechanical Models”  
 2013: *26<sup>th</sup> International Society for Technology in Arthroplasty (ISTA)*, Palm Beach: Keynote  
 2011: *Inst. Mech. Eng. and Royal College of Surgeons*: “Engineers & surgeons joined at the hip”  
 2010: *Accademia delle Scienze di Bologna*: “Synergies between numerical methods and experiments”  
 2010: *17 Cong. Europ. Soc. Biomech.*, Edinburgh: *Instruct. course* “Generation of musculoskeletal models”  
 2009: *Orthopaedic Trauma Care (OTC)*, Boston workshop “Numerical Models and Trauma Care”: instructor  
 2007: *Europ. Fed. Nat. Assoc. Orthop. Trauma (EFORT)*, Florence symposium “Multigen-plus knee”  
 2006: *7<sup>th</sup> World Cong. Biomech.*, Munich: invited talk “*In-vitro* pre-clinical assessment of stem loosening”

### **Editorial boards of journals (selection)**

2012– J. Biomechanics (leading journal of the area of biomechanics): *Editorial Board*  
 2014– Medical Engineering & Physics: *Editorial Board*  
 2006– J. for Mechanics in Medicine and Biology: *Associate Editor*  
 2000– Acta Bioengineering and Biomechanics: *Editorial Board*

Referee for: J Bone Joint Surg, Med Biol Eng Comput, J Str Analysis Eng Des (IMEchE), J Eng Med (IMEchE), Biomaterials, J Orthop Res, J Mech Behav Biomed Mat, Clin Biomech, Annals Biom Eng, J Biomech Eng(ASME), Phil Trans Roy Soc–A, Clin Orth Rel Res, PLOS ONE

### **Roles in scientific societies**

- European Society of Biomechanics: vice-president 2018- ; *treasurer* 2016-2018; *council* 2012-; *member* from 2002.
- *Founding and Executive Board* of Italian Chapter of the European Society of Biomechanics (2011)
- Member of *Europ. Orthop. Res. Soc. (EORS)* and *Virtual Physiological Human Inst. (VPH)* from 2014.

### **Organization of international conferences in last 10 years (Selection: 15 of 24)**

2008-2017 *Congresses of European Soc. of Biomechanics* (yearly, various cities): Scientific Committee.  
 2013 *8<sup>th</sup> Combined Meeting of Orthopaedic Res. Societies CORS* (Venice): Organizer of Symposium.  
 2012 *VPH 2012 Integrative Approaches To Computational Biomedicine* (London): scientific committee.  
 2011 *23<sup>rd</sup> Congress of International Soc. of Biomechanics* (Bruxelles): Scientific Committee.  
 2009 *4<sup>th</sup> International Cong. on Computat. Bioengineering*, Bertinoro, Italy: Chair Organiz. Committee.  
 2006 *5<sup>th</sup> World Congress of Biomechanics* (Munich): Scientific Committee; Track coordinator.  
 2006 *8<sup>th</sup> ASME-ESDA* (Engineering Systems Design and Analysis) (Turin): scientific committee.

### **International prizes (Selection)**

2015 Editors' Choice papers of ASME J. Biomech. Eng.: “Three-Dimensional Local Measurements of Bone Strain: Comparison of Three Digital Volume Correlation Approaches”  
 2013 Invited Faculty at Congr. *International Soc. Technology in Arthroplasty* (ISTA) Palm Beach.  
 2013 Hottinger Baldwin Messtechnik (HBM) best project “Strain gauge measurement in biomechanics”  
 2009 Top 10 cited paper 2006-2008 in *Medical Engineering & Physics*  
 2006 Honorable Mention Award at the Conference of Biomedical Engineering, Szklarska Poreba (Poland)  
 2012 Clinical Biomechanics Award of the European Society of Biomechanics