

Krishnagoud Manda
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Material and Advanced Technologies for Healthcare
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Employment

Lecturer

School of Mechanical and Aerospace Engineering
Queen's University Belfast
Belfast, United Kingdom
01 Nov 2017 → present

Material and Advanced Technologies for Healthcare

Queen's University Belfast
01 Nov 2017 → present

Research Interests

Dr Manda's research interests are computational biomechanics, nonlinear solid mechanics, biomaterials and additive manufacturing, multiscale modelling of soft/hard tissues, musculoskeletal tissue engineering and regenerative medicine. Dr Manda has been involved in various projects focussing on computational modelling of soft tissue (articular cartilage) and micro-macro-mechanical modelling of hard tissue (bone), constitutive modelling of time-dependent behaviour and mechanobiology of bone. His research has more recently focused on bioresorbable biomaterials, 3d printing, in vitro tissue regeneration in bone/cartilage scaffolds and developing predictive mechanobiological models.

Teaching

MSc Mechanical Properties of Materials module (MTS7002)
Module co-ordinator for Laboratory Programme 1 module (MEE1011)
Tutorial and feedback session support for Mathematics 1 module (MEE1001)
Undergraduate projects related to Biomechanics and Biomaterials

Research outputs

Effect of loading frequency on deformations at the bone-implant interface

Xie, S., Manda, K. & Pankaj, P., 27 Sep 2019, In : Proceedings of the Institution of Mechanical Engineers, Part H, Journal of Engineering in Medicine.

Time-dependent behaviour of bone accentuates loosening in the fixation of fractures using bone-screw systems

Xie, S., Manda, K. & Pankaj, P., 25 Oct 2018, In : Bone and Joint Research. 7, 10, p. 580-586

Effect of including damage at the tissue level in the nonlinear homogenisation of trabecular bone

Levero-Florencio, F., Manda, K., Margetts, L. & Pankaj, P., 01 Oct 2017, In : Biomechanics and Modeling in Mechanobiology. 16, 5, p. 1681-1695

Nonlinear homogenisation of trabecular bone: Effect of solid phase constitutive model

Levero-Florencio, F., Manda, K., Margetts, L. & Pankaj, P., 01 May 2017, In : Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine. 231, 5, p. 405-414

Time Dependent Behaviour of Trabecular Bone at Multiple Load Levels

Xie, S., Manda, K., Wallace, R. J., Levero-Florencio, F., Simpson, A. H. R. W. & Pankaj, P., 01 May 2017, In : Annals of Biomedical Engineering. 45, 5, p. 1219-1226

Nonlinear viscoelastic characterization of bovine trabecular bone

Manda, K., Wallace, R. J., Xie, S., Levrero-Florencio, F. & Pankaj, P., 01 Feb 2017, In : Biomechanics and Modeling in Mechanobiology. p. 1-17 17 p.

Micro-CT based finite element models of cancellous bone predict accurately displacement once the boundary condition is well replicated: A validation study

Chen, Y., Dall'Ara, E., Sales, E., Manda, K., Wallace, R., Pankaj, P. & Viceconti, M., 01 Jan 2017, In : Journal of the Mechanical Behavior of Biomedical Materials. 65, p. 644-651 8 p.

Demineralsed Trabecular bone stiffens with increasing load levels

Xie, S., Wallace, R. J., Manda, K. & Pankaj, P., 2017.

Evaluating the macroscopic yield behaviour of trabecular bone using a nonlinear homogenisation approach

Levrero-Florencio, F., Margetts, L., Sales, E., Xie, S., Manda, K. & Pankaj, P., 01 Aug 2016, In : Journal of the Mechanical Behavior of Biomedical Materials. 61, p. 384-396

Linear viscoelasticity - bone volume fraction relationships of bovine trabecular bone

Manda, K., Xie, S., Wallace, R. J., Levrero-Florencio, F. & Pankaj, P., 18 Apr 2016, In : Biomechanics and Modeling in Mechanobiology. 15, 6, p. 1631-1640

A combined nonlinear viscoelastic-viscoplastic model for trabecular bone

Manda, K., Wallace, R. J., Xie, S., Sales, E., Levrero-Florencio, F. & Pankaj, P., 2015.

Anisotropic nonlinear viscoelastic modelling of trabecular bone

Manda, K., Wallace, R. J., Sales, E., Levrero-Florencio, F. & Pankaj, P., 2015.

Implementation and validation of nonlinear anisotropic viscoelastic model for trabecular bone.

Manda, K., Wallace, R. J., Sales, E., Levrero-Florencio, F. & Pankaj, P., 2015.

Massive parallel simulations of trabecular bone

Levrero-Florencio, F., Margetts, L., Manda, K. & Pankaj, P., 2015.

Micro-CT based finite element models predict accurate displacement field measured with deformable image registration

Chen, Y., Dall'Ara, E., Manda, K., Sales, E., Wallace, R. J., Pankaj, P. & Viceconti, M., 2015.

The changing microarchitecture of trabecular bone during compression

Wallace, R. J., Manda, K., Sales, E., Pankaj, P. & Simpson, A. H. R. W., 2015.

Modeling of constrained articular cartilage growth in an intact knee with focal knee resurfacing metal implant

Manda, K. & Eriksson, A., Jun 2014, In : Biomechanics and Modeling in Mechanobiology. 13, 3, p. 599-613 15 p.

FE simulations of cartilage mechanics and growth around a localized defect-filling metal implant

Manda, K., Pankaj, P. & Eriksson, A., 2014.

Time-dependent behavior of cartilage surrounding a metal implant for full-thickness cartilage defects of various sizes: A finite element study

Manda, K. & Eriksson, A., May 2012, In : Biomechanics and Modeling in Mechanobiology. 11, 5, p. 731-742 12 p.

Modeling of articular cartilage growth

Manda, K. & Eriksson, A., 2012.

Finite element simulations of a focal knee resurfacing implant applied to localized cartilage defects in a sheep model
Manda, K., Ryd, L. & Eriksson, A., 15 Mar 2011, In : *Journal of Biomechanics*. 44, 5, p. 794-801 8 p.

Simulating metal implants in full thickness cartilage defects

Manda, K. & Eriksson, A., 2011, *ASME 2011 Summer Bioengineering Conference, SBC 2011*. PARTS A AND B ed. p. 1265-1266 2 p.

Metal plugs for cartilage defects - a finite element study.

Manda, K., 2010, p. 116-119. 4 p.

Particulars

Dr Krishna Manda received his master's degree (M.Tech) in Mechanical Engineering from Indian Institute of Technology Delhi, India and PhD in Engineering Mechanics from KTH Royal Institute of Technology, Stockholm, Sweden. After his PhD, he worked as a postdoctoral research associate at the University of Edinburgh, UK and then as a senior research associate at University of Portsmouth, UK before joining as a lecturer in the School of Mechanical and Aerospace Engineering at Queen's University Belfast in Nov 2017.