Exponent®
Engineering & Scientific Consulting

Greg Grigoriadis, Ph.D.

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Professional Profile

Dr Grigoriadis specializes in solid mechanics, computational mechanics and biomechanics. He uses computational modeling to assess and improve the performance of products and processes. This includes advanced finite element modeling of non-linearly viscoelastic/plastic materials, dynamic loads, thermo-structural loading conditions, dynamically changing contacts, and areas of failure. He also uses computer aided design tools to develop novel or improve existing designs of mechanical systems. He has also extensive experience in designing and performing physical experiments to characterize the material behavior of complex structures and materials, such as lattices, foams, rubbers and polymers. He has offered his services to clients from a wide variety of industries including oil and gas, additive manufacturing, medical device, defense, aerospace, automotive, water and waste treatment, and construction.

As a consultant engineer Dr Grigoriadis has worked in numerous innovative research and development projects, requiring multiple engineering skills, such as the development of an automated harvesting robot, development of a satellite radiation shield, optimization of structures in defense applications using topology optimization and incorporating metal lattice structures, and the development of a testing apparatus, including computational and physical testing processes, to optimize the manufacturing parameters of flexible gas and oil pipes.

As a Research Associate at Imperial College London, Dr Grigoriadis focused on the development of assistive medical devices including orthotic and prosthetic devices and a pressure ulcer prevention cushion that led to several grants and two patents. His doctorate work investigated the behavior of the human lower limb when exposed to underbody blast conditions. For this purpose, he designed an experimental protocol and performed several tests on surrogate lower limbs, including anthropometric testing devices and post-mortem human subjects, and developed a computational model of the lower limb able to replicate underbody blast loading scenarios accurately. The model has been since used to design efficient mitigation and rehabilitation strategies. He has also developed an automated inverse finite element algorithm to derive non-linear material properties of biological tissues under high-rate loading that he then used for industrial projects.

Academic Credentials & Professional Honors

Ph.D., Bioengineering Research, Imperial College London, UK, 2016

M.Sc., Biomedical Engineering, Imperial College London, UK, 2012

M.Eng., Mechanical Engineering, Aristotle University of Thessaloniki, Greece, 2011

Prior Experience

Senior Project Engineer, DC White EC, Guildford, UK, 2020-2022

Consultant Engineer and Co-founder, Metisec, London, UK, 2016-2020

Research Associate, Imperial College London, UK, 2016-2020

Professional Affiliations

Member of the Technical Chamber of Greece

Languages

French

Greek

Patents

WO/2020/053586: Device for supporting a body part, March 2020 (Boyle C., Masouros S.)

WO/2018/224833: Prosthesis for a through-knee amputee, June 2018 (Natt C.)

Publications

Rebelo, E. A., Grigoriadis, G., Carpanen, D., Bull, A. M., & Masouros, S. D., 2021. An Experimentally Validated Finite Element Model of the Lower Limb to Investigate the Efficacy of Blast Mitigation Systems. Frontiers in Bioengineering and Biotechnology, 9, 665656.

Newell, N., Carpanen, D., Grigoriadis, G., Little, J. P., & Masouros, S. D., 2019. Material properties of human lumbar intervertebral discs across strain rates. The Spine Journal, 19(12), 2013-2024.

Nguyen, T.T., Pearce, A.P., Carpanen, D., Sory, D., Grigoriadis, G., Newell, N., Clasper, J., Bull, A., Proud, W.G. and Masouros, S.D., 2019. Experimental platforms to study blast injury. BMJ Military Health, 165(1), pp.33-37.

Grigoriadis, G., Carpanen, D., Webster, C.E., Ramasamy, A., Newell, N. and Masouros, S.D., 2019. Lower limb posture affects the mechanism of injury in under-body blast. Annals of biomedical engineering, 47(1), pp.306-316.

Klemt, C., Nolte, D., Grigoriadis, G., Di Federico, E., Reilly, P. and Bull, A.M., 2017. The contribution of the glenoid labrum to glenohumeral stability under physiological joint loading using finite element analysis. Computer methods in biomechanics and biomedical engineering, 20(15), pp.1613-1622.

Grigoriadis, G., Masouros, S., Ramasamy, A. and Bull, A.M., 2017. The Lower Extremities: Computational Modelling Attempts to Predict Injury. Military Injury Biomechanics, pp.389-410.

Newell, N., Grigoriadis, G., Chirstou, A., Carpanen, D. and Masouros, S.D., Material properties of bovine intervertebral discs across strain rates dataset.

Grigoriadis, G., Newell, N., Carpanen, D., Christou, A., Bull, A.M. and Masouros, S.D., 2017. Material properties of the heel fat pad across strain rates. journal of the mechanical behavior of biomedical materials, 65, pp.398-407.

Presentations

Grigoriadis G., et al. 2018. Prosthesis for through-knee amputees in low-to-middle income countries. APOSM, Thailand.

Grigoriadis G., et al. 2018. Lower limb posture alters the mechanism of injury in under-body blast. IRCOBI, Greece.

Grigoriadis G., et al. 2018. Posture determines the mechanism of injury in under-vehicle explosions. 8th WCB, Ireland.

Grigoriadis G., et al. 2017. Computational modelling of blast injury in CBIS. 2017 NATO HFM-270 meeting, DSTL, UK.

Grigoriadis G., et al. 2017. The Effect of the Posture of the Lower Limb in Anti-Vehicular Explosions. IRCOBI, Belgium.

Grigoriadis G., et al. 2017. Foot & Ankle Injuries in Under-Vehicle Explosions: a Finite Element Study. A Finite Element Model of the Foot & Ankle for Prediction of Injury in Under-Body Blast. 14th US NCCM, Canada.

Grigoriadis G., et al. 2016. An FE Model of the Foot & Ankle for Prediction of Injury in Under-Body Blast. IRCOBI, Spain.

Grigoriadis G., et al. 2016. Injury prediction in under-vehicle explosions: a finite element study. 16 MEIbioeng, UK.

Grigoriadis G., et al. 2014. The material properties of the human heel fat pad across strain-rates. IRCOBI, Germany.

Grigoriadis G., et al. 2014. An inverse FE method for determining material properties of the human heel fat pad across strain rates. CMBBE, Netherlands

Research Grants

GCRF EPSRC grant 2019, Imperial College London, UK - £150k grant to organize workshops on prosthetic & orthotic devices in Rwanda and Sri Lanka

IUK A4I grant 2019, Imperial College London, UK - £50k grant to develop capacity to test novel polymers for oil & gas applications

IAA EPSRC grant 2019, Imperial College London, UK - £150k grant to commercialize a low-cost prosthetic knee-disarticulation device

GCRF EPSRC grant 2018, Imperial College London, UK - £38k grant to organize a workshop on prosthetic devices in Tanzania

Julia Higgins award 2018, Imperial College London, UK - £3k award to develop a 3D print hub to prototype low-cost prosthetics

MRC & Centre for Blast Injury Studies 2012-2016 - Scholarship for PhD studies

Peer Reviews

Journal of Biomechanics

Annals of Biomedical Engineering

Computer Methods in Biomechanics and Biomedical Engineering

Journal of the Mechanical Behavior of Biomedical Materials