

Zainab Altai

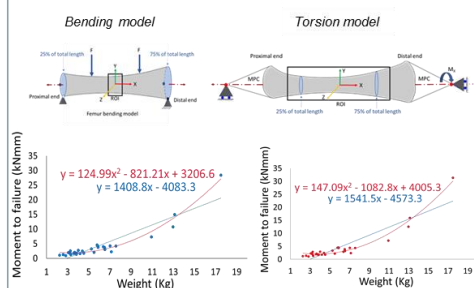


Z.altai@sheffield.ac.uk

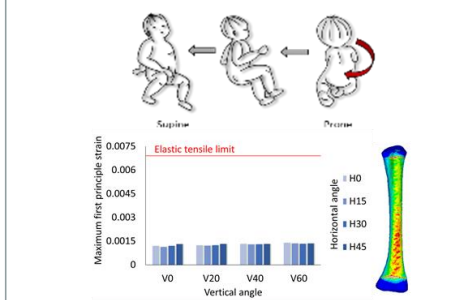
Zainab Altai (ZA) received her PhD in Biomechanics at the University of Sheffield in August 2018. Her work focused on using the finite-element approach to investigate fractures of human long bones in very young children (inflicted fractures in infants) and elderly (osteoporotic hip fractures). Directly after her PhD, Zainab joined MultiSim, where she is further developing acquisition, data fusion and processing protocols for the generation of personalised models of bones and joints. ZB is effectively interacting with colleagues specialised at body and tissue level and collaborating with clinicians at the STH. ZB has co-authored two published papers and showcased her work in ten top conferences worldwide. In MultiSim2, ZA will develop finite element models of the muscles capable of interfacing with both the whole body and the tissue level models and refine the CT2S pipeline in order to model the muscle using MRI and ultrasound images. This approach will also be extended to model musculoskeletal interactions in animals using microMRI.

• Paediatric bone fracture

Femoral fracture under bending and torsional loads

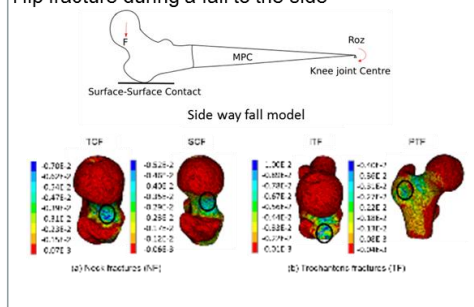


Spontaneous humeral fracture during rolling

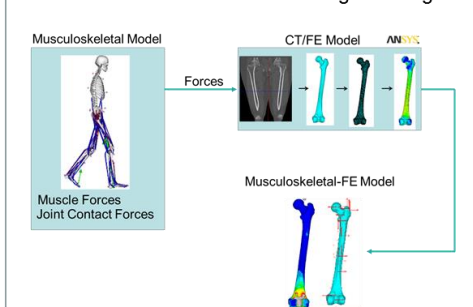


• Risk of fracture in adult

Hip fracture during a fall to the side



Strain distribution on the femur during normal gait



Publications

Altai, Z., Viceconti, M., Offiah, A. C., Li, X. (2018), "Investigating the Mechanical Response of Paediatric Bone under Bending and Torsion Using Finite Element Analysis", *Biomechanics and Modeling in Mechanobiology*, pp1-9, URL: <https://doi.org/10.1007/s10237-018-1008-9>

Bhattacharya, P., Altai, Z., Qasim, M., Viceconti, M. (2018), "A Multiscale Model to Predict Current Absolute Risk of Femoral Fracture in a Postmenopausal Population", *Biomechanics and Modeling in Mechanobiology*, URL: <https://doi.org/10.1007/s10237-018-1081-0>

Castro, A. P. G, Altai, Z., Offiah, A. C., Shelmerdine, S. C., Arthurs, O.J., Li, X., Lacroix, D. (In Submission), "Finite Element Modelling of the Developing Infant Femur Using Paired CT and MRI Scans", *Annals of Biomedical Engineering*

Altai, Z., Viceconti, M., Li, X., Offiah, A. C. (In Submission), "Humeral Fractures in Non-Ambulant Infants: CT-Based Finite Element Investigation Indicates an unlikely Mechanism", *European Radiology*

Altai, Z., Qasim, M., Li, X., Viceconti, M. (In Submission), "The Effect of Boundary and Loading Conditions on Patient Classification Using Finite Element Predicted Risk of Fracture", *Clinical Biomechanics*

Other Acheivements

Altai, Z., Viceconti, M., Li, X., Offiah, A.C. (2018), "Investigating a possible mechanism of humeral fracture in non-ambulant children. The 8th World Congress of Biomechanics in July 2018 (Dublin, Ireland)

Altai, Z., Viceconti, M., Li, X., Offiah, A.C. (2017), " Investigating the mechanical response of the paediatric femur using computer models". The British Society of Paediatric Radiology National Meeting in November 2017 (Manchester, UK)

Altai, Z., Qasim, M., Li, X., Viceconti, M., (2017), " Non-linear Boundary Conditions for a more realistic prediction of femoral fracture during side-fall". The 14th U.S. National Congress on Computational Mechanics in July 2017 (Montreal, Canada)

Altai, Z., Viceconti, M., Li, X., Offiah, A.C. (2017), " investigating the mechanical response of paediatric femur under torsion". The 23rd Congress of the European Society of Biomechanics in July 2017 (Seville, Spain)

Qasim, M., Altai, Z., Li, X., Viceconti, M. (2017), "Clinical Pathway for Osteoporotic Hip Fracture Risk Assessment Using Patient-Specific Finite Element Models". The 23rd Congress of the European Society of Biomechanics, Seville, ES, 2-5 July 2017

Altai, Z., Qasim, M., Li, X., Viceconti, M., (2016), " Prediction of hip fracture risk using nonlinear contact analysis in sideways fall configuration". The 22nd Congress of the European Society of Biomechanics in July 2016 (Lyon. France)