**Validation of a micro-finite-element model for contact-induced stresses at bone joints**

**Deadline:** 1/23/2019

Are you a bright, enthusiastic and self-motivated student interested in a PhD in biomechanics? An exciting PhD opportunity is now available at the Insigneo Institute for in silico Medicine at the University of Sheffield, UK.

**Research context**

Contact occurs everywhere in musculoskeletal biomechanics, most notably at bone joints, where contact-induced stresses determine both fracture risk and joint disease progression.

The recent introduction of a novel contact formulation (SS-SC) has set the stage for dramatic improvements in the predictive accuracy of contact-induced stresses using highly-parallelized micro-finite-element (µFE) solvers.

This PhD project will involve:

- Implementing the novel contact formulation in a state-of-the-art µFE solver;
- Analysing contact-induced stresses in the wrist joint using the improved µFE solver;
- Performing cadaver experiments to validate µFE model predictions.

The candidate is expected to undertake research stays at two collaborating universities (ETH Zürich, Switzerland and KU Leuven, Belgium) during the course of the PhD.

PhD programs in the UK are usually 3 years in duration. The expected start date for this project is 10/1/2019.

Three-year studentships covering the cost of tuition fees and providing an annual tax-free stipend are available on a competitive basis for students irrespective of nationality (please see How to Apply section below).

**About the University of Sheffield**

The University of Sheffield is a Russell Group university, which represents the 24 leading UK universities committed to maintaining outstanding research and teaching environments. The University of Sheffield regularly ranks among the top 10 in the UK in terms of research output. In addition to having a long tradition of world-class engineering research, Sheffield benefits from geographical proximity to the industrial cities of Manchester, Liverpool and Leeds.

The ambition of the Insigneo Institute is to achieve a transformational impact on healthcare. As such, it possesses extensive experience in the development of computer simulations aimed at better understanding of the biomechanics of the musculoskeletal system. Furthermore, this PhD project will leverage collaborations in high-performance computing and cutting-edge experimental techniques at ETH Zürich and KU Leuven.

**Candidate Profile**

The successful candidate should have or be expected to obtain an excellent degree in mechanical engineering, bioengineering, computer science, physics, applied mathematics or a related discipline.

Experience in programming languages (e.g. C, C++, Matlab, Python) is essential. Exposure to high-performance computing or previous knowledge of finite-element analysis and/or experimental testing is highly desirable.

**How to apply**

For further information, please contact Dr Pinaki Bhattacharya (at p.bhattacharya@sheffield.ac.uk) with “VOXCON PhD studentship” in the title. The application deadline is 1/23/2019 (further details [here](#)).