A framework for modelling packed cell tissues

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In a packed tissue neighbouring cells exert high pressure on each other at all times. These mechanical interactions play an important role on the dynamics of the tissue and therefore cannot be neglected [**?**]. We propose a framework to model this type of systems based on a geometric representation of individual cells. The cells interact with each other aiming at minimizing a local potential energy, subjected to non-overlapping constraints. This gives rise to a non-linear non-convex minimization problem, for which there are unfortunately not many tools available. In this talk, I will show an algorithm we have developed for this type of problems: the damped Arrow-Hurwicz algorithm [**?**], as well as some examples and numerical results. This framework can be very useful in the study of packed tissues, as it helps to predict the impact of inter-cellular forces on the dynamics of the whole tissue, which can not be easily addressed through laboratory experiments.

Keywords: modelling cell tissue; mechanical interactions; non-convex optimization; sphere packing.
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