

Microscopic Computed Tomography Analysis of Tissues

Supervisor: R. Ellis

Biological tissues have microscopic structures that range from more or less uniform, or isotropic, to well organized, or anisotropic. In this project, hard tissues will be studied using 3D microscopic computed tomography (μ -CT) scans.

In this project, the student will identify the principal geometric measures of anisotropy that have been used for the structural description of hard tissues and will produce a review of the relevant literature. The supervisor will then provide numerous (μ -CT) scans of hard tissues, including bone and osteophytic growths. The supervisor will also select and provide commercial software for anisotropy computations.

The goal of the project is to determine what, if any, microscopic structure is within osteophytes. The student will analyze the anisotropy measure to determine whether there are any statistically significant patterns of microstructure.

If time permits, the student will independently implement the potentially most useful measures and compare these implementations to the commercial results.