a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

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MECH 493 project: Contact biomechanics - Indentation of an elastic membrane atop an elastic layer

Background and research goal

This project concerns the mechanics of indentation and penetration of soft materials, with focus on biological and bioinspired materials such as hydrogels, skin and other connective tissue. The project will merge experiments with theory and is aimed at provide a useful tool for in-vivo characterization of synthetic and biological soft tissue.

Tasks to be performed by the student

The student is expected to fabricate specimens of phantom tissue for the elastic layer (e.g. adipose) and for the elastic membrane (e.g. skin). The student will also help some graduate students to design and build an apparatus that can prompt varying tension within the elastic membrane. Finally, the student will use our custom indentation testing machine to measure the force evolution during incremental penetration depth with a cylindrical punch of various sizes and for various amount of membrane pre-stretch. Prior to that, the student will be do some preliminary literature review on the current state of the art in in-vivo testing and existing models.

Facilities and team:

The student will utilize experimental equipment located in the Multiscale Mechanics of Materials Laboratory. The student will also interact with one or more graduates students to design the test properly.