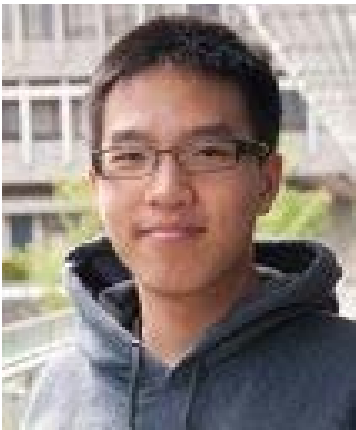


BIOSTATISTICS SEMINAR



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Function-on-function kriging, with applications to 3D-printing of aortic tissues

3D-printed medical prototypes, which use synthetic metamaterials to mimic biological tissue, are becoming increasingly important in surgical applications. However, the mimicking of tissue mechanical properties via 3D-printed metamaterial can be difficult and time-consuming, due to the functional nature of both inputs (metamaterial structure) and outputs (mechanical response curve). To deal with this, we propose a new function-on-function Gaussian process kriging model for efficient tissue-mimicking optimization. A key novelty of our model is the spectral-distance (SpeD) correlation function, which captures important spectral differences between two functional inputs. Dependencies for functional outputs are then modeled via a co-kriging framework. We further adopt shrinkage priors on both the input spectra and the output co-kriging covariance matrix, which allows the model to learn and incorporate important physics. We demonstrate the effectiveness of the proposed model in a real-world study on mimicking human aortic tissue, and show that it can provide quicker and more accurate tissue-mimicking performance compared to existing methods in the medical literature.

Thursday April 2, 2020

3:30 pm - 4:30 pm

Zoom meeting: Please also find a link in the email invite.

https://uncsph.zoom.us/j/893328432?_ga=2.241672322.1864462697.1585234457-1769805331.1548686859



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