BI-CO MATHEMATICS COLLOQUIUM

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"Parameter Identifiability in a Model of in vivo HIV Dynamics"

Friday, April 14, 2023
Talk at 4:00 – Hilles 109
Tea 3:30 – Foyer outside of H109

Abstract:

Parameter identifiability of models in epidemiology was pioneered in the early 1990s, but has recently gained popularity. I will introduce the ideas of differential algebra to determine structural identifiability and Monte Carlo methods of practical identifiability using a classical SIR model. Then for the remainder of the talk, I will apply these ideas to an in vivo model of HIV to determine whether the model parameters can be uniquely identified from experimental data. These models capture the dynamics of CD4+ T-cells and virions in the presence of highly active antiretroviral therapy (HAART). An in vivo model with identifiable parameters can be coupled to a population level model in which infectivity of an individual is determined by their viral load. Through this coupling, this multiscale model can potentially impact the end of the HIV epidemic.

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