

The Intersection of Statistical and Mathematical Models to Describe Complexity in Longitudinal Data

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Abstract:

Systems of differential equations have been used successfully for decades in physics, engineering, and other fields where measurement error or residual errors are not a concern. In general, in these settings models are calibrated to the data which is a successful approach when there is very little residual noise. However, in biology and medicine, this is generally not the case. Thus more formal statistical approaches such as parameter estimation and inference are necessary. In this talk I will describe statistical approaches used in the setting of modeling biomedical observed data with systems of ODEs and comment on the benefits and difficulties when applying standard statistical methods to biomedical data.