

Sequential data assimilation for oncology

Wednesday, October 18, 2023 10:30 AM (1 hour)

The development of PDE models capable of describing tumor growth may help monitor disease progression or predict the efficacy of different therapeutic strategies. However, to be truly informative or predictive, these models need to be corrected and/or parameterized with available observations. The goal of this talk is to present some sequential data assimilation strategies that address these types of problems. More specifically, in the first part we focus on a Luenberger observer that can handle 3D tumor front data. In the second part, we focus on the combination of a Luenberger observer with a population-based Kalman observer, which allows the use of repeated measurements in configurations with common priors (e.g., multiple subjects in a clinical trial or repeated biological measurements) when data are sparse or corrupted by noise. Theoretical results and numerical illustrations with synthetic and real data are presented for both parts.

Presenter: COLLIN, Annabelle