



Karlstad Applied Analysis Seminar (2025)

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Weak-form Equation Learning with wSINDy: An Introduction and Application to Biological Systems

Abstract

Equation learning methods are transforming the modeling of biological systems by enabling researchers to infer governing equations directly from data, rather than prescribing them a priori. This talk will provide a beginner-friendly introduction to a recent equation learning algorithm: weak-form Sparse Identification of Nonlinear Dynamics (wSINDy). We will outline the advantages of the weak formulation, describe the core ideas underlying wSINDy, and present some recent applications in biological settings. In particular, we will discuss current and forthcoming work on structured population dynamics and cell migration during wound healing.