State-Dependent Delays: A Gateway to Complex Dynamics.

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In this talk, I will explore how state-dependent delays—where the delay dynamically changes with the system's state—unlock remarkably rich and complex behaviors. Even in simple models, such delays can produce oscillations, chaos, and other complex behaviors over time. I will present examples, simulations, and key ideas to illustrate the sensitivity and nonlinear effects inherent in these systems. The goal is to give an accessible introduction to a topic that connects delay equations with complex dynamics.