

Title: Explaining the reservoir computing phenomenon using randomized discrete-time signatures

Abstract: The possibility of uniformly approximating fading memory input/output systems using randomly generated state-space systems subjected to cheap training is a promising approach to the theory of recurrent neural networks that has been successfully implemented in many applications. In this talk we explain this surprising phenomenon by showing how the finite-dimensional random projections of certain universal infinite-dimensional approximants yield randomly generated state affine systems with linear readouts that exhibit excellent performance and, more importantly, provide a deep explanation of the reservoir computing phenomenon.