

1157-65-262

Tong Qin* (qin.428@osu.edu), **Zhen Chen**, **John Jakeman** and **Dongbin Xiu**. *Data-driven governing equations approximation using deep neural networks.*

In this talk, I will introduce our recent work on using neural networks to learn dynamics from data. In particular, basing on the one-step integral form of the ODEs, we propose to use the residual network (ResNet) as the basic building block for dynamics recovery. The ResNet block can be considered as an exact one-step integration for autonomous ODE systems. Autonomous dynamical systems will first be used to illustrate the general framework. And then extensions to dynamical systems with random or time-dependent parameters will be discussed. (Received January 30, 2020)