1163-47-1064 **Joel A Rosenfeld*** (rosenfeldj@usf.edu), Tampa, FL. *Generalization of Weighted Compositions Operators and Applications in Dynamical Systems Theorem.*

In this talk we present several generalizations of weighted composition operators, and detail how they can be applied in modeling nonlinear systems relevant to control theory.

Specifically, we will present recent work on Dynamic Mode Decompositions (DMD) and occupation kernels, which use observed trajectory data from a dynamical system to construct finite rank representations of operators for spectral decomposition and reconstruction of nonlinear systems. Modally, the operators leveraged in DMD are unbounded.

However, with the proper selection of weighted composition operator and Hilbert space provides a compact operator for spectral decomposition with minimal adjustment of the observed data. These generalizations utilize reproducing kernel Hilbert spaces, both scalar and vector valued, where the vector valued spaces are integral to the study of control systems. (Received September 14, 2020)