The conference is supported by the National Laboratory for Health Security project RRF-2.3.1-21-2022-00006

On numerical approximation of functional differential equations with impulses using equations with piecewise constant arguments

Ferenc Hartung

University of Pannonia, Hungary
hartung.ferenc@mik.uni-pannon.hu

In this talk we study numerical approximation of several classes of functional differential equations with the help of equations with piecewise constant arguments. After summarizing some earlier work in this field, we study two recent results. First we consider a scalar linear delay equation with constant delay associated with an impulsive self-support condition. We define a numerical approximation scheme using a sequence of approximate delay equations with piecewise constant arguments, and we discuss its theoretical convergence. We present numerical examples to illustrate the applicability of the method, and we also observe existence of periodic solutions of the impulsive delay equation using numerical studies. In the second part of the talk we investigate uniform approximation of a nonautonomous delayed CNN-Hopfield-type impulsive system on the half-line $[0, \infty)$ with an associated impulsive differential system where a partial discretization is introduced with the help of piecewise constant arguments.