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# Diamond- $\tau$ Generalized Hukuhara Differentiability for Interval-Valued Functions and Its Application to Interval Differential Equations on Time Scales

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## Abstract

Mathematical models play an essential role in describing and investigating real world phenomena. It has various applications in natural sciences, social sciences, engineering, etc. In some classical mathematical models the knowledge of variables and coefficients need to be assumed precisely. However, in many practical cases, the obtained models are established with uncertain or vague information caused by imprecise measurements or indeterminacy of events. There are several approaches in order to overcome these shortcomings such as fuzzy set theory, interval theory, stochastic theory. In this talk, we focus on time scale calculus in the interval setting. In particular, we propose the diamond- $\tau$  differentiability for interval-valued functions based on the generalized Hukuhara difference on time scales. We first begin with the definition and important characteristics of the diamond- $\tau$  generalized Hukuhara differentiability that are naturally investigated based on the limit of interval-valued functions on time scales. Furthermore, we also study the interval differential equations on time scales by using the proposed conception. Some numerical examples are provided to illustrate the necessity and efficiency of the new concept in these problems.

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