

ULAM STABILITIES OF A FIRST ORDER ITERATIVE FUNCTIONAL-DIFFERENTIAL EQUATION

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Abstract. In this paper we deal with special types of data dependence, the so-called Ulam stabilities, regarding the first order iterative functional-differential equation

$$x'(t) = f(t, x^{[1]}(t), x^{[2]}(t), \dots, x^{[m]}(t)), \quad t \in [a, b], \quad a, b \in \mathbb{R}, \quad a < b,$$

with $x \in C^1([a, b], [a, b])$. Here $x^{[m]}$ denotes the m^{th} iterate of the function x , ($m \geq 0$) i.e.

$$x^{[m]} := \underbrace{x \circ x \circ \dots \circ x}_m.$$

Key Words and Phrases: Differential equation, integral equation, differential inequality, fixed point equation, Ulam–Hyers stability, Ulam–Hyers–Rassias stability.

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