Abstract

Chaos theory has been at the forefront of research in the last few decades. In this research, we study chaos theory and various definitions of chaos, especially Devaney's definition of chaos. We propose a generalization of Devaney's chaos in metric spaces onto topological spaces. We also propose a relaxation on Devaney's definition conditions and study the effect of such relaxation on chaos definition. At last, we study the application of chaotic maps in hash functions and propose a new method for hash function construction using the Double chaotic map.