

Generalized Parabola Chaotic map for Pseudorandom Random Number Generator

Nattagit Jiteurtragool

Department of Computer and Information Sciences, Faculty of Applied Science,
King Mongkut's University of Technology North Bangkok, Bangkok, 10800, *Thailand*
nattagit.j@sci.kmutnb.ac.th

Abstract—In this paper, a generalized form of chaotic map based on nonlinear function with parabolic shape is introduced. The study involves the investigation of chaotic dynamics in terms of apparent in time-domain, and both qualitatively and quantitatively examination using bifurcation diagram and Lyapunov exponents. Furthermore, the practical application of these parabolic chaotic maps is showcased in a pseudo-random number generator, with its performance evaluated using statistical tests from the NIST SP800-22 test suite.

Keyword— chaotic map, discrete-time chaotic, parabola function, pseudo random number generator, NIST



Nattagit Jiteurtragool was born in Bangkok, Thailand in 1992. He received B.Eng. in Computer Engineering from Computer Engineering Department, Faculty of Engineering, Thai-Nichi Institute of Technology (TNI) in 2013. He received M. Eng and Ph.D. in 2015 and 2018, respectively, from the Department of Electronic and Photonic System Engineering, Kochi University of Technology (KUT) in Japan. He is currently with the Department of Computer and Information Sciences, Faculty of Applied Science, King Mongkut's University of Technology North Bangkok (KMUTNB). His areas of research interests are machine learning, embedded systems, information security systems, and nonlinear dynamics of chaotic systems.