

## Sine Square Distribution: A New Statistical Model Based on the Sine Function

Rand Q. Al-Faris

Institute for Mathematical Research, University Putra Malaysia, Serdang 43400, Selangor Darul Ehsan, Malaysia. Email: randalfaris@hotmail.com

Shahjahan Khan\*

Department of Mathematics and Computing, Australian Centre for Sustainable Catchments, University of Southern Queensland, Toowoomba, Queensland, Australia. Email: khans@usq.edu.au

### Abstract

This paper introduces a new continuous distribution based on the sine function. The proposed Sine Square distribution has one parameter and its domain depends on this parameter. The probability density function  $f(x)$  of a Sine Square variable  $X$  as well as its cumulative distribution function  $F(x)$  are defined. The formulas for the  $r^{th}$  raw moment and central moments, moments generating function (*m.g.f.*), characteristic function (*c.f.*) and some other properties of the new distribution are provided. A method to generate random variables from the Sine Square distribution is analyzed and applied.

**Keywords:** Sine function, probability and distribution functions, generating functions, simulation of random variables.

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\*Corresponding author