



THE SAMA CIRCULAR MODEL ON REAL LIFE

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ABSTRACT

Mathematics is a Universal language. The term "mathematics", is taken from the ancient Greek word; "*mathema*"; meaning of it is the "subject of instruction". It is the key to understand all sciences. Mathematical modeling plays a vital role in real life. It converts a real world problem into mathematical language and helps in decision making. Mathematical models are classified in many ways. Some of them are, Static; Dynamic; Deterministic and Stochastic models. A model is said to be "Static" when it does not have time- dependent component. In contrast, dynamic models contain time-dependent component. Deterministic models are not associated with any randomness whilst the stochastic models does. Hence stochastic models or Statistical Models are more applicable in real life. The Statistical models can be broadly classified into two parts: univariate statistical models and multivariate statistical models. A univariate statistical model is an equation or set of equations explaining the behavior of a single random variable over time. The univariate statistical models also known as Time Series models. Time series data comprises several components; Trend, Seasonal variations, cyclical variations and irregular variations. These series follow irregular wave like patterns. This type of data is common in the fields of, Meteorology, Agriculture, Finance, Economics, Education, Healthcare and more. The Decomposition technique and the Auto Regressive Integrated Moving Average (ARIMA)/Seasonal Auto Regressive Integrated Moving Average (SARIMA) are the widely applied methods for forecasting such a series. Yet these techniques are unable to model the cyclical variation and they have some other weaknesses. According to the literature, modeling cyclical variation is highly important and crucial. Some researchers have attempted the Artificial Neural Network for the purpose, yet the success of them were doubtful. There was no Statistical techniques for the purpose. The Sama Circular Model (SCM) is a recently joined member to the family of forecasting techniques, developed on Newton's law of Circular Motion, Fourier transformation and Least Square Estimation. Indeed it is a frequency domain model. The SCM is capable in capturing all the components of a time series; Trend, Seasonal and Cyclical. It has been successful in various real life applications and was superior to the other techniques.

Keywords: Stochastic Models, Time Series