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Nawa Raj Pokhrel* (nawaraj@mail.usf.edu), 4501 Montego Bay Court Apt 4, Tampa, FL 33613, and **Chris Tsokos** and **Hansapani Rodrigo**. *Cybersecurity: Time Series Predictive Modeling of Vulnerabilities of Desktop Operating System Using Linear and Non-linear Approach*.

Vulnerability forecasting models helps us to predict the number of vulnerabilities that may occur in the future for a given Operating System(OS). There exist few models that focuses on quantifying future vulnerabilities without consideration of trend, level, seasonality and non linear components of vulnerabilities. Unlike traditional ones, we propose a vulnerability analytic prediction model based on linear and non-linear approaches via time series analysis in Artificial Neural Network(ANN) and Support Vector Machine(SVM) setting. Utilizing time series approach, this study has developed a predictive analytic model for three popular Desktop Operating Systems, namely, Windows 7, Mac OS X, and Linux Kernel by using their reported vulnerabilities on the National Vulnerability Database (NVD). Based on these reported vulnerabilities, we predict ahead their behavior so that the OS companies can make strategic and operational decisions like secure deployment of OS, facilitate backup provisioning, disaster recovery, diversity planning, maintenance scheduling, etc. Similarly, it also helps in assessing current security risks along with estimation of resources needed for handling potential security breaches and to foresee the future releases of security patches. (Received September 11, 2017)