# Abstract

Volatility is an important area of study in finance theory as it allows people to measure the risk associated with decisions. A popular assumption that is backed by observation is that financial assets exhibit volatility clustering, making it a necessary feature of volatility models. One such model is called Stochastic Volatility (SV) which treats the conditional variance as an autoregressive process. Conventional methods for estimating the variance are not straight forward, so the Unscented Kalman filter (UKF) in a joint, nonlinear filter structure for simultaneous state and parameter estimation. Additionally, the Generalized Unscented Transform (GUT) is assimilated into the UKF, allowing for the modeling of non-Gaussian distributions with increased accuracy. Multiple simulations equivalent to four years of daily financial returns were generated to check how various forms of the UKF perform on the same data and also compare to other models. The results of the simulation show that the joint estimation of the parameters is successful, even allowing for parameter tracking, if they change across time.