1154-60-2695 **George Yin**, **Le Yi Wang** and **Thu Thi Le Nguyen*** (fw6622@wayne.edu), 31133 Cedar Ridge Ln, Madison Heights, MI 48071. *Switching Stochastic Approximation and Applications to Networked Systems.*

This work investigates the interaction between control and communications in networked systems by studying a class of stochastic approximation algorithms that accommodate random network topology switching processes, time-varying functions, nonlinear dynamics, additive and non-additive noises, and other uncertainties. Interaction among control strategy and the multiple stochastic processes introduces critical challenges in such problems. By modeling the random switching as a discrete-time Markov chain and studying multiple stochastic uncertainties in a unified framework, it is shown that under broad conditions, the algorithms are convergent. The performance of the algorithms is further analyzed by establishing their rate of convergence and asymptotic characterizations. Simulation case studies are conducted to evaluate the performance of the procedures in various aspects (Received September 17, 2019)