1163-39-138 **Eddy Kwessi*** (ekwessi@trinity.edu), 1 Trinity Place, San Antonio, TX 78212, and **Lloyd Edwards** (ljedward@uab.edu), Birmingham, AL. *A Nearly Exact Discretization Scheme for the FitzHugh-Nagumo Model.*

Human brain contains a large number of neurons that often evolve in large neural networks representing groups of neural populations where each element interacts under excitement impulses with other elements. Often, systems of continuous differential equations are used to model these ensembles of neurons. In the presence of data however, discrete models are preferred and it has been well documented that without proper care, discrete and continuous models do not always yield the same dynamics. The non-standard methods and later additions aim to address the discrepancies between continuous and discrete models. One model often used in neuroscience to represent ensembles of neurons is the FitzHugh-Nagumo system. This system consists of two ordinary differential equations linking an activator and an inhibitor and represents the excitability of the neural network. In this paper, we propose a nearly exact discretization scheme for the FitzhHugh-Nagumo model. We prove that the scheme preserves qualitatively and quantitatively the dynamics and features of the original continuous system. (Received August 20, 2020)