1096-92-566 **Kathryn G. Workman*** (kate.workman@richmond.edu), **Shuang Zhao** (shuang.zhao@richmond.edu) and **John W. Cain** (jcain2@richmond.edu). *Restricted Feedback Control of a Cardiac Arrhythmia.*

When an equilibrium state of a physical or biological system suffers a loss of stability (e.g., via a bifurcation), it may be both possible and desirable to stabilize the equilibrium via closed-loop feedback control. In our study, the desired equilibrium state is a normal heart rhythm, and feedback control is intended to prevent a bifurcation to an abnormal rhythm known as T-wave alternans. Using a discrete-time model of cardiac rhythm, we simulate and mathematically analyze an algorithm known as time-delay autosynchronization (TDAS) as a means of preventing alternans. TDAS works by making small adjustments (perturbations) to the heart rate during each beat. Our analysis improves upon prior studies in two ways. First, we generalize TDAS so that perturbations need not be required during every beat. Second, our model of heart rhythm incorporates short-term "memory" in the sense that each beat is influenced by several previous beats. (Received September 06, 2013)