

Executive Summary		
Title: Data-Driven Dynamic Models for Exploring Systemic Risk with Unknown Inputs		Project ID: 7a.014.UVA
Today's Date: 02/16/2018	Estimated Start Date: 07/01/2018	Type: <input type="checkbox"/> New <input checked="" type="checkbox"/> Continuing
Principal Investigator: William Scherer	University: University of Virginia	Email: wts@virginia.edu
Other Project Participants: Hunter Moore (student)		
Project Description: This project will work to develop an algorithm that can self-detect the system's state-space from an unknown multivariate, time-series set of inputs. This state-space will then be used to develop a stochastic model of the system with the intention of exploring systemic risk, possible system control methods, and beneficial regulatory and/or policy changes. This methodology will then be generalized for use across a broad spectrum of fields.		
Experimental Plan: Data from real, time-continuous systems or from simulations allowing for human in the loop analysis will be evaluated using the developed algorithm in an effort to develop the state-space. This system will then be modeled as a stochastic system and utilized for the exploration of systemic risk, possible system control methods, and beneficial regulatory and/or policy changes. The methodology will then be generalized for use across a broad spectrum of fields.		
Related Work: This work builds on 6a.055.UVA "Data-Driven Dynamic Models for Exploring Systemic Risk" as well as previous work from the same research group with a focus on financial systems.		
How this project is different: This project is different from previous work in that it seeks to self-detect its state-space and will be generalized for use in various fields.		Milestones for Year 1: 6 months: Proposed methodology 9 months: Evaluated test data 12 months: Evaluative report
Deliverables for Year 1: 1. Proposed methodology for algorithm. 2. Test data evaluated with proposed methodology. 3. Evaluative report on work including proposed future research.	Proposed Budget for Year 1: Personnel Students Overhead Other (<i>describe</i>) Other (<i>describe</i>) Total	\$ 0 \$ 36000 \$ 4000 \$ 0 \$ 0 \$ 40000
How this Project may be transformative? This project has the potential to decrease modeling time by self-detecting its states and discover states in a system that may have been overlooked by a modeler alone.		
Potential Member Company Benefits: The member companies of this project will benefit from the developed system, the reduction in modeling time for future systems, the development of more complete systems, and definitive work in the field of systemic risk exploration and mitigation.		
Progress to Date: Literature review and preliminary thoughts on methodology		
Estimated Knowledge Transfer Date: 06/30/2019		