

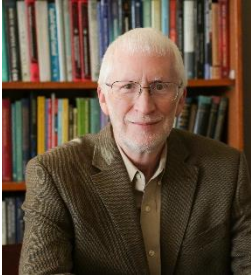


**Spring 2017 Colloquium Series**

**Tuesday, February 28, 2017**

**1:30-2:00 pm – Meet and Greet –BB340**

**2:00-3:00 – Seminar Talk – GC Metals Hall**



Dr. Kevin L. Moore, Dean College of Engineering and Computational Sciences,  
Colorado School of Mines.

***Comments on Research and a Technical Talk: Learning to Cooperate***

**Abstract:**

In this talk I will give some comments on research and academics from my perspective as Dean of the College of Engineering and Computational Sciences. Then I will give a technical talk combining two of my research areas: iterative learning control (ILC) and cooperative control via consensus. The specific problem addressed is the design of control algorithms for groups of controlled agents (such as robotics) that enables them to learn (through repetition) to execute a cooperative task. Motivated by the prototypical example of a marching band, we model the problem as a dynamic networks with evolution in two directions: a finite time axis and an infinite iteration axis. A distributed algorithm is constructed based on nearest neighbor information, and its convergence is established via a Rössler system-based two-dimensional approach. It is shown that a desired relative formation between agents can be achieved along a finite time trajectory if and only if the union of the interaction graphs between the agents over iteration intervals of finite length has a spanning tree for every time step. Through the proposed algorithm, multiple agents can "learn to cooperate." Although it would be interesting to consider, in the talk we will not speculate as to whether the results can be applied to, for instance, groups of faculty and students in academia!

**Bio:**

Kevin L. Moore is the Dean of the College of Engineering and Computational Sciences at the Colorado School of Mines. He received the B.S. and M.S. degrees in electrical engineering from Louisiana State University and the University of Southern California, respectively. He received the Ph.D. in electrical engineering, with an emphasis in control theory, from Texas A&M University in 1989. He has previously been on the faculty at Idaho State University and Utah State University, where he directed the Center for Self-Organizing and Intelligent Systems, developing a variety of autonomous robots for government and commercial applications. His research interests include iterative learning control, autonomous systems and robotics, and applications of control to industrial and mechatronic systems, including the cooperative control of networked systems. He is the author or co-author of three research monographs and numerous peer-reviewed publications and is a licensed professional engineer, an ABET Program Evaluator, and involved in several professional societies and editorial activities.