Abstract: Controllers interact with many other aspects of a system: hardware, software, users, decision-makers, planners...topics often studied in Computer Science. Some of these interactions are unknown or ignored in control system theory and design. This can lead to system fragility, suboptimal performance, or limited capabilities. Studying these interactions improves understanding of the strengths and weaknesses of current models and assumptions. Leveraging this understanding can lead to improved system performance by creating new models and methods that account for and exploit these interactions. In this talk, I will present research that exemplifies the benefits of deep study of the interactions between control and four topics in computer science: real-time systems, machine learning, user interactions, and software. Each project is couched in deployed systems in the NIMBUS lab at the University of Nebraska - Lincoln.

Bio: Justin M. Bradley holds a B.S. in computer engineering (2005) and M.S. in electrical engineering (2007) from Brigham Young University, and M.S. (2012) and Ph.D. (2014) degrees in aerospace engineering from the University of Michigan. He worked at Lawrence Livermore National Lab as a control software engineer on the Integrated Computer Control System for the National Ignition Facility. He is currently an assistant professor in the Department of Computer Science and Engineering at the University of Nebraska - Lincoln and a co-director of the Nebraska Intelligent MoBile Unmanned Systems (NIMBUS) lab. He conducts research in cyber-physical systems with an emphasis on decision and control, control software, and robot autonomy in aerospace systems.