

Antsalkis

Cyber-Physical Systems (CPS) involve large numbers of heterogeneous cyber and physical networked subsystems that interact tightly, may change dynamically and may expand or contract. Such CPSs are rapidly becoming ubiquitous. Designing and preserving properties of a CPS over its lifespan is very challenging. Passivity and dissipativity are energy like concepts that offer great promise in guaranteeing properties, such as stability, in complex heterogeneous interconnected systems that are changing dynamically. Passivity indices that provide a measure of the degree of passivity are used to generalize classical results in interconnected systems, and results for continuous, discrete and switched systems in networks with delays, event triggered architectures, conic systems are shown. Special attention is paid to passivity and dissipativity when model approximations are introduced. Properties of dissipative systems with symmetries and approximate symmetries are also discussed.