

Optimal Transmission Intervals in Networked Control Systems

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The area of Networked Control Systems (NCSs) investigates realistic information exchange phenomena such as intermittent information, packet dropouts, quantization effects, communication delays, out-of-order package arrivals, scheduling protocols, channel distortions, etc. The term intermittent information indicates non-trivial and aperiodic data arrivals at the controller and/or plant end. Besides determining stability repercussions of intermittent transmission instants, it is also important to study their impact on control system performance and energy consumption. Employing Reinforcement Learning (RL) techniques, we seek for transmission instants that minimize Linear Quadratic Regulator (LQR)-like performance indices. Our theoretical findings are supported experimentally using an inexpensive motion capture system and nano quadcopters.