Network-Based Control and Filtering with Industrial Applications

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With rapid developments of information technology, network-based control has been widely used in industrial processes. However, various network-induced constraints such as transmission delays, packet dropouts/disorder and quantization, also bring great challenges to conventional control theories. On the other hand, in order to improve the efficiency and gain more profit, the two-layer network-based feedback control scheme has shown its great advantages over the traditional one-layer network-based one in operational control of industrial processes. The lecture will first introduce some elegant approaches to network-based control and estimation problems. And then a novel two-layer network-based architecture for operational control of industrial processes will be discussed. It will be shown that under the proposed framework, the overall optimal operational control of industrial processes can be achieved.