Delay-Dependent Stability Analysis for Large Scale Production Networks of Autonomous Work Systems

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Abstract: This paper considers the problem of stability analysis for a class of production networks of autonomous work systems with delays in the capacity changes. The system under consideration does not share information between work systems and the work systems adjust capacity with the objective of maintaining a desired amount of local work in progress (WIP). Attention is focused to derive explicit sufficient delay-dependent stability conditions for the network using properties of matrix norm. Finally, numerical results are provided to demonstrate the proposed approach.

Keywords: *stability analysis; production networks; autonomous systems; delay.*

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