

Multiresolved control of discrete-time linear systems with application to power systems

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Abstract: In this talk, we propose a design method of multiresolved control for discrete-time linear systems. In the proposed control system, we implement a transitory compensator specialized in controlling a short-term system behavior into a standard controller that is designed for controlling a long-term behavior. To establish such control architecture, we construct a low-rank model having the same reachable and observable subspaces as those of the original system in the range of its rank. Then, we derive a redundant state-space realization associated with the low-rank model. A cascaded structure of the redundant realization enables to systematically design a transitory compensator that stabilizes the short-term system behavior while cooperating with a standard controller. The efficiency of the multiresolved control is shown through an example of frequency control in power networks. ***Joint work with Jun-ichi Imura.***