

Distributed Optimal Control for Input Interacting Plants

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Summary

Major technological progresses in communication and computational systems coined the new expression “Cyber-physical Systems” and strongly motivate the consideration of approximations to the solution of optimal control problems over networks, in which the nodes of a network interact to yield the final controller behavior.

In this realm, the present communication addresses the problem of the development of distributed sub-optimal control algorithms for plants that interact through the input in a cooperative way.

The algorithm proposed computes the control at each node by considering that the manipulated variables of neighbor nodes are accessible disturbances. Assuming that these variables do not change, the control design problem is thus reduced to an optimization in the presence of accessible disturbances. In order to take into consideration the adjustment of the manipulated variables to reflect the changes in neighbor nodes, a coordination algorithm is used. For this sake, distributed optimization algorithms that rely on ADMM or game concepts are employed.

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