Synchrony in Coupled Cell Networks

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November 22, 2012

Abstract

Coupled cell systems are networks of dynamical systems (the cells), where the links between the cells are described through the network structure, the coupled cell network. Synchrony subspaces are spaces defined in terms of equalities of certain cell coordinates that are flow-invariant for all coupled cell systems associated with a given network structure. In this paper we show how to obtain the lattice of synchrony subspaces for a general network and present an algorithm that generates that lattice. We prove that this problem is reduced to get the lattice of synchrony subspaces for regular networks. For a regular network we obtain the lattice of synchrony subspaces based on the eigenvalue structure of the network adjacency matrix.

AMS classification scheme numbers: 34C15 37C10 06B23 15A18

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[‡]Research partially funded by the European Regional Development Fund through the programme COMPETE and by the Portuguese Government through the FCT under the projects PEst-C/MAT/UI0144/2011 and PTDC/MAT/100055/2008.

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