

Resilience Analysis on Infrastructure Networks with Heterogeneous Nodes

C.Y. Lam and K. Tai

Abstract The analysis of infrastructure network reliability is an important task required for disruption prevention, protection or recovery planning. In order to truly encapsulate the actual structure of infrastructure networks, it is proposed to analyze the infrastructure networks with heterogeneous nodes, i.e. the nodes with distinct operating features in the network. In this paper, an infrastructure network with heterogeneous nodes is modeled as a graph with a set of nodes with supply feature, a set of nodes with demand feature, and a set of connections between the nodes. The network resilience can then be evaluated by the weighted sum of all the resilience of the demand nodes, so the proposed resilience analysis approach can be used to indicate the ability of the network to resist disruption.

C.Y. Lam (✉)

Hiroshima University, 4-1, Kagamiyama 1-Chome, Higashi-Hiroshima 739-8527, Japan
e-mail: cylam@hiroshima-u.ac.jp

K. Tai

Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798, Singapore