

Title: “Measuring graph symmetry: discussion and applications”

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Apart from its aestetical appeal, symmetry is considered as an essential tool for understanding complex systems[1]: It has been traditionally used in the realm of theoretical physics, to study differential equations or dynamical properties [2], to name just a few. Recently, since network and graph theoretic tools grow as unifying concepts for complexity and universal properties studies [5], it seems natural to ask for the symmetry of networks and its implications.

In order to address this target, a reference to algebraic graph theory is deserved [6,7]. Nevertheless, there is an additional need of effective computational tools to tackle real applications. In this line of research, two measures for graph symmetry have been proposed recently which have rendered useful in order to predict dynamical behaviour [3] or robustness of a network in the face of attack [4].

This short paper elaborates on this kind of measure. Although the both aforementioned measures are essentially equivalent for a subset of graphs, their application to graph spectra (for Erdos or scale free random models [5]) raises some validity questions which are empirically explored in this proposal in order to propose a better symmetry measure. Some applications so as to illustrate its potential utility are developed in toy problems.

References:

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