Degree distributions of bipartite networks and their projections
DEMIVAL VASQUES FILHO, DION O'NEALE, University of Auckland — Bipartite networks play an important role in the analysis of social and economic systems as they explicitly show the conceptual links between different types of entities. As an example, it is possible to build networks to investigate interactions regarding scientific and technological innovation that are well represented by a natural bipartite structure. Since we are often most interested in only one of the node types (e.g. the authors in an author-publication network), it is common to end up working with a projected version of the underlying bipartite network. The topology of projections and the dynamics that take place on it are highly dependent on the probability distribution of nodes degrees. We use the formalism of generating functions to infer how the degree distributions of the original bipartite network affect the distribution in the projected version. Moreover, we create artificial bipartite graphs by arbitrarily choosing degree distributions for the sets of nodes and construct the projection to analyze the resulting probability distribution. Our findings show that when projecting onto a particular set of nodes, the resulting degree distribution follows the behavior of the probability distribution of such nodes, subject, however, to the tail of the opposite distribution.

Demival Vasques Filho
University of Auckland