

# Finding independent trees

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**Abstract.** This work was motivated by the study of a multi-tree approach to reliability in distributed networks and by the study of non-separating paths and cycles in highly connected graphs. We first give a result on “non-separating chains” in 4-connected graphs. This result is then used to obtain a “non-separating chain decomposition” of a 4-connected graph  $G$ , and an  $O(|V(G)|^2|E(G)|)$  algorithm for constructing such a decomposition. As an application of this decomposition, we show how to produce four “independent spanning trees” in a 4-connected graph in  $O(|V(G)|^3)$  time. This is joint work with Sean Curran and Orlando Lee.