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Recognizing (unit) interval graphs by zigzag graph searches

Corneil, Olariu, and Stewart [SODA1998; SIDMA2009] presented a recognition algorithm for interval graphs by six graph searches. Li and Wu [DMTCS2014] simplified it to only four. The great simplicity of the latter algorithm is however eclipsed by the complicated and long proofs. The main purpose of this paper is to present a new and significantly shorter proof for Li and Wu's algorithm, as well as a simpler implementation. We also give a self-contained presentation of the recognition of unit interval graphs, based on three sweeps of graph searches. We make several new structural observations that might be of independent interests.