Weak visibility queries of line segments in simple polygons.

Given a simple polygon \( P \) in the plane. The authors study here the weak visibility query problem, that is to build a data structure for \( P \) such that the weak visibility polygon \( \text{Vis}(s) \) can be computed efficiently for any query line segment \( s \) in \( P \). Two new data structures are presented and their efficiency is compared with earlier works. Comparing with the result of B. Aronov et al. [Discrete Comput. Geom. 27, No. 4, 461–483 (2002; Zbl 1008.68144)], one of the data structures presented reduces the query time and uses much less preprocessing time and space, while the other data structure has less preprocessing time than the result of M. N. Bygi and M. Ghodsi [“Weak visibility queries in simple polygons”, in: Proc. of the 23rd Canadian Conference on Computational Geometry (2011)].

Keywords: visibility polygons; weak visibility from line segments; visibility queries; zone theorem
doi:10.1016/j.comgeo.2015.02.001