

Some effective algorithms for solving problems in computational geometry based on the oriented line method

Trinh Minh Duc

Abstract: This paper focuses on researching and developing efficient algorithms to solve several fundamental problems in the field of computational geometry, specifically intersection and convex hull problems. The main approach of the research is based on the oriented line method, an advanced technique that simplifies complex spatial relationships by determining the orientation and relative position of geometric entities. We propose optimal data structures and improved processing procedures to minimize time complexity and memory usage. Experimental results show that the proposed algorithms not only ensure high accuracy but also demonstrate superior stability when processing large-scale data. This research makes an important contribution to improving processing performance for applications such as computer graphics and geographic information systems.

Keywords: Computational geometry, Algorithm, Directed path, Computational complexity, Data structure