In modern 3D graphics, scenes made of triangles are usually used, combined with methods based on ray tracing. Hierarchical data structures, called accelerating trees, are often used to speed up the search for intersection between ray and the scene. When testing the best current methods with non-polygonal geometry (line segments), we have found out that those structures cannot build an effective tree in many cases.

The aim of this work is to formulate the problem mathematically. Thanks to this, the whole subject becomes more transparent and we can see the shortcomings of current methods, which have not yet been pointed out. At the result, we develop an algorithm which generalizes all current methods, which is not dependent on geometry and directly shows the space for improvement.