

Summary

This collection of articles elaborates on the consequences of a design choice in which geometric objects are built up without using floating-point arithmetic, but with integers only.

We begin with “Motivation,” whose title is sufficient to summarize its content.

The main arc of the collection is to establish storage requirements (i.e., how many bits and words are needed) in order to achieve or surpass the precision many GIS professionals have grown accustomed to.

In “Storage Requirements,” we show that 64-bit integers are more than sufficient to surpass the precision of conventional typical floating-point point numbers. Additionally, they can be used efficiently to build up more complex structures, such as lines.

So as not interrupt the flow of “Storage Requirements,” the subtopics of “Line Amid Two Points,” “Line through a Point and the Centroid of a P-Parallelogram” (a p-parallelogram is a special kind of parallelogram), and “Line through the Centroids of Two P-Parallelograms” are presented in separate articles.