

Re: Fast search for a number within tolerances

Source: <http://coding.derkeiler.com/Archive/Java/comp.lang.java.programmer/2005-06/msg00598.html>

- *From:* Wibble <Wibble@xxxxxxxxxxxxxxxx>
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Jonas Forssell wrote:

Gentlemen,

I have a set of three dimensional nodes - each with a position in space (x,y,z).
I need to write a fast algorithm in Java to merge nodes that are close -i.e. within a specific tolerance.

Easy way: Run through the array of nodes, check each node against every other node and merge if needed. This will take an awful amount of time when the array is 500.000 nodes or larger.

Smart way:??

Thanks for your help

If all your nodes are equidistant, do you merge them into a single node?

Partition your space into a 3D matrix with each cube of a discrete size. Merge nodes that are within the same cube. Thats $O(n)$. You can use a HashMap to model a sparse matrix. You can position the final node at an average of the component positions.

Read a book on graphics like Foley&VanDamm. Theres lots of ways to partition and filter 3D models that are more efficient and look better than node merging.

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