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# Vatti clipping algorithm

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The **Vatti clipping algorithm**<sup>[1]</sup> is used in [computer graphics](#). It allows clipping of any number of arbitrarily shaped *subject polygons* by any number of arbitrarily shaped *clip polygons*. Unlike the [Sutherland–Hodgman](#) and [Weiler–Atherton](#) polygon clipping algorithms, the Vatti algorithm does not restrict the types of polygons that can be used as subjects or clips. Even complex (self-intersecting) polygons, and polygons with holes can be processed. The algorithm is generally applicable only in [2D space](#).

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## Description [\[edit\]](#)

Clipping is defined as the interaction of subject and clip polygons. While clipping usually involves finding the **intersections** (regions of overlap) of subject and clip polygons, clipping algorithms can also be applied with other [boolean clipping](#) operations: **difference**, where the clipping polygons *remove* overlapping regions from the subject; **union**, where clipping returns the regions covered by either subject or clip polygons, and; **xor**, where clipping returns the regions cover by either subject or clip polygons *except* where they are covered by both subject and clip polygons.

The Vatti algorithm involves processing both subject and clipping polygon edges in an orderly fashion, starting with the lowermost edges and working towards the top; this is conceptually similar to the [Bentley–Ottmann algorithm](#). This [sweep line](#) approach divides the problem space by *scanlines*, imaginary horizontal lines that pass through every vertex of the participating polygons. These *scanlines* outline *scanbeams* – the spaces between adjacent scanlines. These scanbeams are processed in turn, starting with the lowest scanbeam, with the algorithm adding points of intersection within these scanbeams into the solution polygons.

## See also [\[edit\]](#)

- [Greiner-Hormann clipping algorithm](#)
- [Sutherland–Hodgman clipping algorithm](#)
- [Weiler–Atherton clipping algorithm](#)
- [Boolean operations on polygons](#)

## References [\[edit\]](#)

- ↑ Bala R. Vatti. "A generic solution to polygon clipping" [↗](#), Communications of the ACM, Vol 35, Issue 7 (July 1992) pp. 56–63.

## External links [\[edit\]](#)

- [Clipper, an open-source freeware implementation of the Vatti algorithm](#)[↗](#)



*This [computer graphics](#)–related article is a *stub*. You can help Wikipedia by [expanding it](#).*

Categories: [Clipping \(computer graphics\)](#) | [Computer graphics stubs](#)

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