



WIKIPEDIA
The Free Encyclopedia

[Main page](#)

[Contents](#)

[Featured content](#)

[Current events](#)

[Random article](#)

[Donate to Wikipedia](#)

[Wikipedia store](#)

Interaction

[Help](#)

[About Wikipedia](#)

[Community portal](#)

[Recent changes](#)

[Contact page](#)

Tools

[What links here](#)

[Related changes](#)

[Upload file](#)

[Special pages](#)

[Permanent link](#)

[Page information](#)

[Wikidata item](#)

[Cite this page](#)

Print/export

[Create a book](#)

[Download as PDF](#)

[Printable version](#)

Languages

[日本語](#)

[中文](#)

[Edit links](#)

Article [Talk](#)

[Read](#)

[Edit](#)

[View history](#)

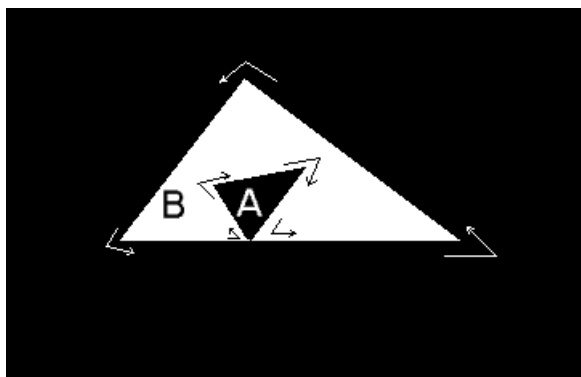


Winged edge

From Wikipedia, the free encyclopedia

The **winged edge data structure** is a data [representation](#) used to describe [polygon models](#) in [computer graphics](#). It explicitly describes the geometry and [topology](#) of faces, edges, and vertices when three or more surfaces come together and meet at a common edge. The ordering is such that the surfaces are ordered counter-clockwise with respect to the innate orientation of the intersection edge. Moreover the representation allows numerically unstable situations like that depicted below.

The winged edge data structure allows for quick traversal between faces, edges, and vertices due to the explicitly linked structure of the network. This rich form of specifying an [unstructured grid](#) is in contrast to simpler specifications of [polygon meshes](#) such as a node and element list, or the implied connectivity of a [regular grid](#).



Pseudocode [\[edit\]](#)

Here is a data structure suitable for representing a winged edge. The abbreviation "WE" stands for "Winged Edge".

```
class WE_Edge {
    WE_Vertex vert1, vert2;
    WE_Face aFace, bFace;
    WE_Edge aPrev, aNext, bPrev, bNext; // clockwise ordering
    WE_EdgeDataObject data;
}
class WE_Vertex {
    List<WE_Edge> edges;
    WE_VertexDataObject data;
}
class WE_Face {
    List<WE_Edge> edges;
    WE_FaceDataObject data;
}
```

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

- [Quad-edge data structure](#)
- [Combinatorial maps](#)
- [Doubly connected edge list](#)
- [Doubly linked face list](#)
- [Half-edge data structure](#)

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

- Bruce G. Baumgart. 1972. Winged Edge Polyhedron Representation.. Technical Report. Stanford University, Stanford, CA, USA.



The Wikibook *Wings 3D/User Manual* has a page on the topic of: *The Nature of Subdivision*

- Bruce G. Baumgart. 1975. A polyhedron representation for computer vision. In Proceedings of the May 19-22, 1975, national computer conference and exposition (AFIPS '75). ACM, New York, NY, USA, 589-596. DOI=10.1145/1499949.1500071 <http://doi.acm.org/10.1145/1499949.1500071> ([Winged Edge Polyhedron Representation for Computer Vision](#))
- [The Winged-Edge Data Structure](#), on Michigan Technological University
- [Winged Edge](#), on university of Pisa

Categories: [Computer-aided design](#) | [Computer graphics data structures](#)

This page was last modified on 10 September 2013, at 08:56.

Text is available under the [Creative Commons Attribution-ShareAlike License](#); additional terms may apply. By using this site, you agree to the [Terms of Use](#) and [Privacy Policy](#). Wikipedia® is a registered trademark of the [Wikimedia Foundation, Inc.](#), a non-profit organization.

[Privacy policy](#) [About Wikipedia](#) [Disclaimers](#) [Contact Wikipedia](#) [Developers](#) [Mobile view](#)

