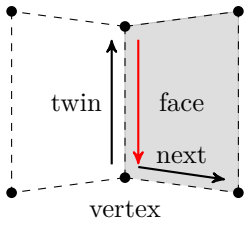
CS550 - Half-Edge

Due date -

1 Description



Implement a **half-edge data** structure.

- Every edge should be directed, meaning that every original edge should be split in two.
- Every edge contains:
  - The next edge in CCW direction
  - The face it belongs to
  - The twin edge (ie. the edge that goes in inverse direction and is connected to the other face)
  - The vertex it is connected to
  - Optional. The previos edge.
- Also store the vertices and the faces

Recommendation Store the edge neighbours in a pointer fashion. This could make things complicated at the beginning but will make contact generation much more straight forward.

2 Features

- Must be able to create an object from a triangle soup (assume convexity)
- This implies that it should be able to detect twin edges automatically
- Must be able to merge coplanar polygons
- Must be unit tested, start from the simple problems and complicate it.
  1. Create a triangle
  2. Create a quad
  3. Create two neighbour quads
  4. Create an AABB
  5. Create an arbitrary convex polyhedra

3 Provided material

A basic testing and window framework is provided. Unit test libraries are provided. Simple OBJs are provided. There is no OBJ parser provided.