

# Assignment in Computer Graphics II

– Assignment 6 –  
Computer Graphics and  
Multimedia Systems Group  
David Bulczak, Christoph Schikora

## Assignment 1 [2 Points] Data structures for polygon meshes

Given the following data structure for polygon mesh representation:

- All vertices are stored in a list with arbitrary order. Every vertex can be accessed by an unique ID.
- All faces are stored in a list with arbitrary order. For every face there is a list with vertex IDs. This list is ordered counter-clockwise.

You can assume that the polygon mesh is 2 manifold and that there are no holes i.e. every edge has two adjacent faces.

1. Develop pseudocode that realizes the above described data structure by a Winged-Edge structure. What is the corresponding runtime?
2. Develop pseudocode that realizes the above described data structure by a Half-Edge structure. What is the corresponding runtime?

## Assignment 2 [1 Point] Work on data structures for polygon nets

Develop pseudocode (using the reference labels `vert1`, ... ) for Winged-Edge and Half-Edge data structures for the following tasks:

1. Given a polygon, all edges of this polygon have to be determined.
2. Given a vertex, all edges incident to this vertex have to be determined.

**Annotation:** For the data structure Half-Edge either the 'Outgoing'- or the 'Incoming'-edges have to be determined. It is not necessary to determine both edge types.

**Submission:** 20.11.2014, before/at the beginning of the exercise.