Basic Objects for CG: simplex and cube Computer Graphics Jorg Peters





Basic Objects for CG: Platonic Solids

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6, 5 Platonic solids: Tetrahedron, hexahedron, octahedron, dodecahedron, icosahedron 3,3 Polyhedron Vertices + Edges + Faces
Schläfli symbol Vertex configuration + Euler's formula: tetrahedron 4 3.3.3 6 {3, 3} v-e+f = 2 - 2 qenus211 - 190 8 cube 12 {4, 3} 4.4.4 6 octahedron 6 12 8 3.3.3.3 {3, 4} [F-E+V=2-290nu dodecahedron 20 324 30 12 {5, 3} 5.5.5 260 $16_{-(16+16)} + 16 = 0$ icosahedron 12 30 {3, 5} 20 3.3.3.3.3 9

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• 5 Platonic solids:

Good choice for vertex coordinates: start with cube with vertices (±1, ±1, ±1)





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5 Platonic solids:
Why not more?
→ angle sum

Ĩ 10

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Basic Objects for CG



Data Structures and File Formats

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- Connectivity(topology, orientation)
- Attributes (position, normal,color)



Data Structures and File Formats

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File Formats: e.g. .off (Object File Format)



.3dm .3ds .sat .ai .amf .dwg .dxf .cd .iges .sat .dgn .m .pdf .ply .sldprt .x .pts .svg .skp .stl .step .stp .obj .rib .xgl .x_t .zpr .fbx

Data Structures and File Formats

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Data Structures: <u>Half-Edge</u>



EMPTY

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V - E + F = 2 - 2(2) = -2



