Introduction to Computer-Aided-Design

Introduction

Why

- How to model real world objects? - Design
- How to put forth ideas in visual manner Communication
- How to verify that design serves the purpose Analysis
- How to get it made? Manufacturing

All of the above can happen without Computers..but Better if assisted by Computers/Software That's why : Computer Aided

. . . (CAx)

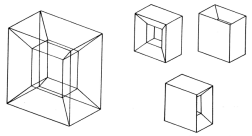
Classification

- By dimensionality: 2D/3D
- 2-Manifold vs Non-manifold
- Precision: Exact/Approximate
- What to store?
  - Procedure
  - Result
  - Hybrid

By dimensionality

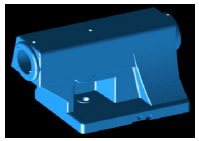
- 2D model: Point, line, circular arc, planar curve

- 3D model
  - Wire frame



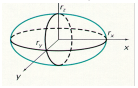
  - Surface

  - Solid



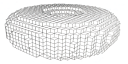
By Precision

- Exact (?) model : Continuous/Smooth representation. Explicit / implicit / parametric curves / surfaces



- Approximate model
  - Cloud of points

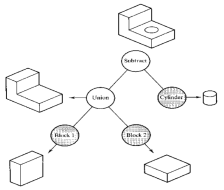
  - Voxel



  - Mesh

By Storage

- Procedural model : CSG (Constructive Solid Geometry)



- Result based model : B-Rep (Boundary representation)