Solid Modeling Overview

ENGR 1182
SolidWorks 01
Solid Modeling

Simple Parts

- Solid modeling uses simple steps in a computer program to create 3D rendering of parts
  - Ex: lens cap and reflector cone of flashlight
  - Manufacturer can use 3D rendering to injection mold parts and test fit

- Solid modeling also can be used for determining volume and mass of parts
  - Changing materials updates these values
  - Efficiency of design and costs can be factored in
Solid Modeling

Complex Parts

- Advanced techniques are used to create more complex parts
  - Ex: flashlight cap and spring

- Similarly the steps to manufacture such parts are more complex and numerous

- Tolerances may be compromised on more complex parts and features
Assemblies of Parts

- Assemblies can be made up of any number of simple and complex parts
- Solid Modeling is not meant simply for aesthetic design
- Practical systems can be fabricated from models and assemblies
- The interaction of parts in an assembly can be studied from solid models
Extracted 2D Drawing Files

- Dimensioned drawings are used as communication tools between engineers and manufacturers
  - Remember: Solid Modeling is meant to be produced and practical in nature.
- Dimensioned drawings can be handed to skilled machinists who can create your part or design
Assembly Drawings

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Assembly Animations

- http://youtu.be/6OR-uz4knV0
Operational Animation

- http://youtu.be/ioAU7gnsTb8
Flow Simulations

http://youtu.be/ZX46RvmJUB4
Finite Element Analysis

- Model with Constraints
- Color map of Stress
Rapid Prototyping
CAM Animation

http://youtu.be/vyS-shnGNI8
3D Printing Animation

http://youtu.be/pSXuq3RbLko
SolidWorks Worldwide