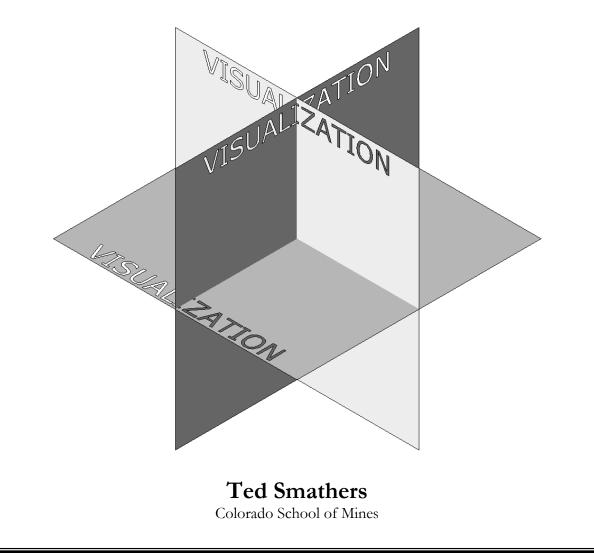
## Visualization for Engineers and Scientists

An Engineering Graphics Text for Design Programs

Second Edition





www.SDCpublications.com

Schroff Development Corporation

## **Table of Contents**

CHAPTER 1	
Looking at Objects	1
Proportions	1
Scales	2
Proportion and the Golden Ratio	5
The Golden Ratio	6
Fibonacci Numbers	9
Assignments	10
CHAPTER 2	
Perspective Views	11
Vanishing Points	11
Angled Surfaces in Perspective	13
Circular Objects in Perspective	14
Spacing in Perspective	14
Examples of Perspective Sketches	15
Assignments	

## CHAPTER 3

Orthographic	Views	and	Multi-View
Sketching			19

Coordinate Systems	19
Multi-View Sketches	27
Problem Set	29
Auxiliary Views	47
Problem Set	52

## CHAPTER 4

Isometric Views and Three	
Dimensional Visualization	57
The Isometric-Orthographic Relationship	57
Oblique and Inclined Planes	59
Orthographic to Isometric to Orthographic	
to Isometric	60
Ambiguity	63
Problem Set	65
Boolean Operations	117
CHAPTER 5	
Section Views	119
The Cutting Diane	110

119
121
121
121
122

Ribs and Gussets	123
Aligned Sections	125
Revolved Sections	126
The Broken Our Section	126
Problem Set	127
Chapter 6	
Dimensions	141
Symbols	141
Size and Location Dimensions	145
Dimensions and Extension Lines	146
Baseline and Chain Dimensions	147
Dimensions and Tolerance	149
Angles	152
Holes and Cylinders	153
Notes and Symbols	154
English of Metric?	155
Line Precedence	156
An Example of a Dimensioned Part	156
Problem Set	159
Design Intent	171
Formatting	174
An Academic Example of Dimensioning	176
Problem Set	179
CHAPTER 7	
<b>Construction Techniques</b>	191
· · · · ·	
Circle Definitions	192
Geometric Relationships	193
Perpendicularity	193
Tangency	194
Coradial and Collinear Geometry	195
Construction	196
Perpendicular Bisector	196
Perpendicular to a line though a point	197
Bisect an Angle	198
Circle through Three Points	199
Construct Equilateral Triangle	200
Construct Triangle with lines of	
different lengths	201
Construct a Pentagon	202
Construct a Hexagon	203
Divide a Line into Equal Parts	204
Construct an Egg Shaped Shape	205
Construct Arcs Tangent to Two Circles	206
Sketch an Ellipse	207
Problem Set	209