

Contents

2.1.1 Visualization as Visual Patterns 28

2.1.2	Visualization as Organized Inventory	30
2.1.3	Visualization as Communication	31
2.2	VISUALIZATION DESIGN SPACE TODAY	31
2.2.1	Visualization Anatomy	31
2.2.2	Visualization Encoding	31
2.3	PREPROCESSING TEXT FOR THE VISUALIZATION PIPELINE	36
2.4	DERIVING A VISUALIZATION PIPELINE FOR TEXT	37
2.5	FURTHER READING	40

CHAPTER 3 ■ Characterizing Text 43

3.1	LITERAL DATA	43
3.1.1	Functional Benefits: The Data Contains Text	44
3.1.2	Perceptual Benefits: Fast, Efficient Access to Detail	44
3.1.3	Cognitive Benefits: Reasoning Aid	47
3.1.4	Language Constraints	48
3.2	TYPOGRAPHIC ATTRIBUTES	49
3.2.1	Alphanumeric Glyphs (i.e. Letters and Numbers)	50
3.2.2	Symbols and Paired Delimiters	51
3.2.3	Weight (and Bold)	52
3.2.4	Oblique Angle (and Italic)	53
3.2.5	Underlines	54
3.2.6	Case (Upper, Lower, Small Caps, and Proper)	55
3.2.7	Width (Condensed/Expanded, Scaling, and Spacing)	56
3.2.8	Typeface (i.e. Font)	57
3.2.9	Low-Level Font Parameters: X-Height, Contrast, Stress, Serif Types, etc.	59
3.2.10	Shifting Baseline and Text on a Path	61
3.3	NON-TYPE VISUAL ATTRIBUTES	62
3.3.1	Size	63
3.3.2	Rotation	64
3.3.3	Fill Color	64
3.3.4	Outline and Outline Color	64
3.3.5	Gradients or Drop-Shadows	65
3.3.6	Superimposition and Contrast	66
3.3.7	Distortion and Extrusion	66

3.3.8	3D Orientation	66
3.3.9	Motion	67
3.3.10	More: Texture, Blur, Transparency, Etc.	67
3.4	MARKS AND TEXT SCOPE	67
3.4.1	Point Marks: Characters, Codes, Syllables, and Words	68
3.4.2	Line Marks: Phrases and Sentences	69
3.4.3	Area Marks: Paragraphs and Chapters	69
3.4.4	Readability of Text	71
3.5	TEXT LAYOUTS: PROSE, TABLES, AND LISTS	71
3.5.1	Prose	71
3.5.2	Tables	72
3.5.3	Lists and Indices	73
3.6	TEXT INTERACTIONS	74
3.7	TEXT CHARACTERIZATION FOR VISUALIZATION DESIGN	
	SUMMARY	76
3.8	FURTHER READING	77
CHAPTER 4 ■ Using the Design Space		79
4.1	STRUCTURED DATA AND BERTIN'S PERMUTATIONS	80
4.2	UNSTRUCTURED DATA ANALYSIS AND NLP	82
4.3	MULTIPLE ATTRIBUTES	85
4.4	ROLES FOR TEXT IN VISUALIZATIONS	86
4.5	VISUALIZATION BUSINESS OPPORTUNITIES	90
4.6	FURTHER READING	93
PART II Labels		
CHAPTER 5 ■ Point Labels		97
5.1	LABELS AS POINT MARKS	97
5.2	READING IS FASTER THAN INTERACTING	97
5.3	CODES AS LABELS	99
5.4	FULL LABELS	102
5.5	GROUP LABELS AND VERY LONG LABELS	104
5.6	MANY LABELS AND LONG LABELS	106
5.7	MASSIVE DATA, LABELS, AND ZOOM	108
5.8	FURTHER READING	110

CHAPTER 6 ■ Distributions	111
6.1 HIGHLIGHTING VALUES IN STEM AND LEAF PLOTS	112
6.2 LITERAL LEAVES	113
6.2.1 Literal Leaves Showing Alphanumeric Codes	113
6.2.2 Literal Leaves Showing Words and Phrases	114
6.3 LITERAL STEMS AND LITERAL LEAVES	116
6.3.1 Literal Stems and Leaves with Codes	116
6.3.2 Literal Stems and Leaves with Words	118
6.3.3 Literal Stems and Leaves with Phrases	120
6.4 STEMS AND LEAF HIERARCHIES AND GRAPHS	121
6.4.1 Simple Stems and Leaf Hierarchy	121
6.4.2 Stems and Leaf Graph	122
6.4.3 Stems and Leaf Hierarchies on a Corpus	124
6.5 STEMS AND LEAF INTERACTIONS	125
6.6 FURTHER READING	130
CHAPTER 7 ■ Microtext Lines	131
7.1 TEXT ON PATHS	131
7.2 THE NEED TO VISUALIZE MANY TIMESERIES	132
7.2.1 Line Charts with Many Lines	135
7.2.2 Microtext and River Labels with Many Lines	138
7.2.3 Do Microtext Lines Work?	140
7.2.4 Interactive Microtext Line Charts	141
7.3 MICROTEXT APPLIED TO OTHER VISUALIZATION LAYOUTS	143
7.4 FURTHER READING	144
PART III Formats	
CHAPTER 8 ■ Sets and Categories	149
8.1 CHALLENGES VISUALIZING MULTIPLE CATEGORIES	149
8.2 INDICATING SET MEMBERSHIP WITH TEXT	151
8.3 TYPOGRAPHIC VENN AND EULER DIAGRAMS	153
8.4 TYPOGRAPHIC GRAPHS	156
8.5 TYPOGRAPHIC SCATTERPLOTS	161
8.6 TYPOGRAPHIC MOSAIC PLOTS	162

8.7	TYPOGRAPHIC BAR CHARTS WITH STACKED LABELS	165
8.8	HANDLING MANY CATEGORIES	168
8.8.1	Many Different Visual Attributes	168
8.8.2	Visual Attributes Applied to Individual Characters	171
8.8.3	Decoding vs. Noticing a Difference	171
8.8.4	Going Further	172
8.9	FURTHER READING	172
CHAPTER 9 ■ Maps and Ordered Data		175
9.1	PROBLEMS WITH THEMATIC MAPS	176
9.2	TYPOGRAPHIC THEMATIC MAP WITH A SINGLE ORDERED VARIABLE	177
9.3	MULTI-VARIATE TYPOGRAPHIC THEMATIC MAPS	179
9.4	HANDLING LONG LABELS	180
9.5	SCALING TO THOUSANDS OF LABELS	180
9.6	NON-DISTORTED TYPOGRAPHIC MAPS	181
9.7	TYPOGRAPHIC SCOPE: PARAGRAPHS AND GLYPHS	181
9.8	DO TYPOGRAPHIC THEMATIC MAPS WORK?	184
9.9	TYPOGRAPHIC ORDERING WITH OTHER ATTRIBUTES AND LAYOUTS	186
9.10	FURTHER READING	187
CHAPTER 10 ■ Ratios and Quantitative Data		189
10.1	QUANTITATIVE DATA	189
10.2	PROPORTIONS ALONG A STRING (BAR CHARTS WITH LONG LABELS)	190
10.2.1	Proportions along Words and Phrases	190
10.2.2	Proportions along Lines of Text	191
10.2.3	Proportions to Indicate Ranges	191
10.2.4	Proportions, Distributions, and Areas	192
10.2.5	Proportions in Paragraphs	196
10.2.6	Stacked Proportions	200
10.2.7	Multiple Proportions	200
10.2.8	Semantic Proportions and Expressive Text	203
10.3	POSITIONS ALONG A STRING	204
10.4	CAVEATS, ISSUES, AND LIMITATIONS	205

PART IV **Text Layouts**

CHAPTER 11 ■ Prose and Prosody	211
11.1 ENHANCED READING	211
11.2 SKIM FORMATTING	212
11.3 FORMATTING LETTERS FOR PRONUNCIATION, SPELLING, AND PROSODY	218
11.4 FURTHER READING	220
CHAPTER 12 ■ SparkWords	221
12.1 HISTORIC PRECEDENT FOR SPARKWORDS	221
12.2 SPARKWORDS DEFINED	222
12.3 SPARKWORDS IN NARRATIVE	222
12.3.1 Categorical SparkWords	222
12.3.2 Ordered SparkWords	223
12.3.3 Quantitative SparkWords	228
12.4 SPARKWORDS IN LISTS	230
12.5 SPARKWORDS IN TABLES	230
12.5.1 Orders of Magnitude	230
12.5.2 Tables with Data Added into Typographic Formats	233
12.6 FURTHER READING	237
CHAPTER 13 ■ Opportunity and Checklist	239
13.1 VALIDATION	242
13.2 CHECKLIST	242
13.2.1 Language	242
13.2.2 Legibility	243
13.2.3 Alphanumeric Codes	244
13.2.4 Formats	244
13.2.5 Long Labels	245
13.2.6 Layout Challenges	246
13.2.7 Typeface	246
13.2.8 Interactions	247
13.2.9 More	247

CHAPTER 14 ■ References	249
14.1 ACKNOWLEDGMENTS	249
14.2 PEER-REVIEWED RESEARCH BIBLIOGRAPHY	249 252
INDEX, 263	