

# Course Schedule

## **First Session (1 hour, 30 minutes)**

### **A. Introduction (Healey, 5 minutes)**

### **B. Perceptual Issues in Low-Level Human Vision (Healey, 65 minutes)**

1. Introduction
2. Preattentive processing in human vision (with interactive examples via course web page)
3. Preattentive color (with interactive examples via course web page)
4. Preattentive texture (with interactive examples via course web page)
5. Apparent motion
6. Practical applications (image evaluation, volume rendering, GIS)

### **C. Color Perception, Motion Perception, and Applications (Rheingans, 20 minutes)**

1. Fundamental mechanisms of color perception
2. Selecting colors for accurate information representation
3. Using color to direct attention in visualization

## *Coffee Break (15 minutes)*

## **Second Session (2 hours)**

### **D. Color Perception, Motion Perception, and Applications (cont'd) (Rheingans, 50 minutes)**

4. Motion perception
5. Using motion to convey information
6. Using interaction to improve performance

### **E. Conveying Form, Shape, and Depth in Computer-Generated Images (Interrante, 70 minutes)**

1. Motivation and background
2. Image Understanding: context, organization and perceptual grouping
3. Metric judgements and geometric illusions
4. Perceptual cues to 3D shape and depth.
5. Techniques for emphasizing shape and depth information
6. Practical applications (scientific visualization, non-photorealistic rendering)

# Table of Contents

Course Summary .....	ii
Biography .....	iii
Course Outline .....	iv
Table of Contents .....	v
1. Perceptual Techniques for Scientific Visualization (Healey) .....	1
References .....	21
Slides .....	27
2. Color Perception and Applications (Rheingans) .....	43
References .....	48
Slides .....	50
3. Motion and Interaction (Rheingans) .....	65
References .....	67
Slides .....	69
4. Cognitive Issues in Visual Perception (Interrante) .....	81
5. Perceiving and Representing Shape and Depth (Interrante) .....	105
6. Reprints (Healey) .....	136
Volume Rendering of Abdominal Aortic Aneurysms, from <i>IEEE Vis '97</i> .....	136
On the Use of Perceptual Cues and Data Mining for the Effective Visualization of Scientific Datasets, from <i>Graphics Interface '98</i> .....	145
Large Datasets at a Glance: Combining Textures and Colors in Scientific Visualization, to appear in <i>IEEE TVCG</i> .....	154
7. Reprints (Rheingans) .....	178
Color, Change, and Control for Quantitative Data Display, from <i>IEEE Vis '92</i> .....	178
Dynamic Color Mapping of Bivariate Qualitative Data, from <i>IEEE Vis '97</i> .....	186
8. Reprints (Interrante) .....	194
Illustrating Surface Shape in Volume Data via Principal Direction-Driven 3D Line Integral Convolution, from <i>IEEE TVCG 3, 2</i> .....	194
Conveying the 3D Shape of Smoothly Curving Transparent Surfaces via Texture, from <i>SIGGRAPH 97</i> .....	214