Abstract:
In this talk I survey gaze-based interaction, distinguishing eye movement analysis from synthesis. My focus will be on four forms of interaction, including diagnostic (off-line measurement), active (selection, look to shoot), passive (foveated rendering, a.k.a. gaze-contingent displays), and expressive (gaze synthesis). Diagnostic interaction includes training or assessment of expertise. Active interaction is rooted in the desire to use the eyes to point and click, with gaze gestures recently growing in popularity. Passive interaction is the manipulation of scene elements in response to gaze direction, with an example goal of improvement of frame rate. Expressive eye movement centers on synthesis, which involves the development of a procedural (stochastic) model of microsaccadic jitter, embedded within a directed gaze model, given goal-oriented tasks such as reading. In discussing each form of interaction, I will briefly review classic works and recent advancements and highlight outstanding research problems.

Bio:
Dr. Duchowski is a professor of Computer Science at Clemson University. He received his baccalaureate (1990) from Simon Fraser University, Burnaby, Canada, and doctorate (1997) from Texas A&M University, College Station, TX, both in Computer Science. His research and teaching interests include visual attention and perception, eye tracking, computer vision, and computer graphics. He joined the School of Computing faculty at Clemson in January, 1998. He is a noted research leader in the field of eye tracking, having produced a corpus of papers and a monograph related to eye tracking research, and has delivered courses and seminars on the subject at international conferences. He maintains Clemson’s eye tracking laboratory, and teaches a regular course on eye tracking methodology attracting students from a variety of disciplines across campus. His most recent research activities focus on eye movement analysis including the measurement of cognitive load and synthesis of eye movements for realistic character modeling and animation.