Abstract:
Humans do not think like computers. Our minds are ‘designed’ for us to function as embodied beings in the world in ways that are: 1. Physical-Spatial; 2. Temporal-Dynamic; 3 Social-Cultural; and 4. Affective-Emotional. These aspects of embodiment give us four lenses to understand the embodied mind and how computation/technology may support its function. I shall first show how language, as a core human capacity, is rooted in human embodied function. We will see that mental imagery shapes multimodal (gesture, gaze, and speech) human discourse. Second, I shall present an assemblage of interactive projects that illustrate how our concept of human embodiment can inform technology design through the light of our four lenses. Projects cluster around three application domains, namely 1. Technology for special populations (e.g. supporting active reading for the blind); 2. Learning and Education (e.g., support creative storytelling for children); and 3. Experience (e.g. navigation through virtual spaces, experience of images, socially-grounded crowd simulation, and affective communication). I shall conclude by discussing our research on how Making may be integrated into the elementary school classroom as a situated practice. The goal is that by constructing their own science projects and making their own materials for their language-arts classes, 3rd to 5th grade students: 1. Learn concepts related to their science and language arts classes; and 2. Develop as STEM-capable (as it relates to Self-Efficacy), and STEM-interested (as it relates to Self-Concept) individuals.

Bio:
Francis Quek is a Professor of the Department of Visualization with courtesy appointments in both Computer Science and Engineering and Psychology at Texas A&M University. He joined Texas A&M University as an interdisciplinary President’s Signature Hire to bridge disparities in STEM. Formerly he has been the Director of the Center for Human-Computer Interaction at Virginia Tech. Francis received both his B.S.E. summa cum laude (1984) and M.S.E. (1984) in electrical engineering from the University of Michigan. He completed his Ph.D. in Computer Science at the same university in 1990. Francis is a member of the IEEE and ACM. He performs research in Making for STEM learning, embodied interaction, embodied learning and sensemaking, multimodal verbal/non-verbal interaction, multimodal meeting analysis, interfaces to support learning, vision-based interaction, multimedia databases, medical imaging, assistive technology for the blind, human computer interaction, computer vision, and computer graphics. He leads several multiple-disciplinary research efforts to understand the communicative realities of multimodal interaction.