Abstract:
In an information-based, technology-driven society, proficiency in mathematics is increasingly important, yet too many students are not receiving the instruction they need to succeed. Instead, mathematics instruction is frequently dominated by lecture and decontextualized problems that fail to connect with students. There is a critical need to reconceptualize mathematics as an engaging, interactive, relevant activity. Recognizing the body as a resource for mathematical thinking is one way to significantly change how students learn and teachers teach. New research demonstrates increased achievement when students physically act out mathematics concepts. Further, motion-controlled game systems like the Nintendo Wii or Xbox Kinect offer innovative opportunities for body-based learning. Yet, we know very little about how to effectively design and implement these kinds of activities in the classroom. The objectives of this project are to develop two applications for the Xbox Kinect for use with elementary and middle school students and to identify key design principles that support learners assigning mathematical meaning to their actions. The resulting applications will support more students developing strong mathematical reasoning skills and will propel research on body-based learning into new territory by enabling new methods of collecting and analyzing data about students’ actions.