



DEPARTMENT OF  
PSYCHOLOGY  
*Illinois State University*

## The Department of Psychology & CBS Colloquium Series

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# Perceiving Haptic Distance-To-Break in a Simulated Minimally Invasive Surgery Task

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In minimally invasive surgery (MIS), it is critical to accurately interpret haptic information and apply appropriate force magnitudes onto soft tissue in order to minimize tissue trauma. The surgeon's administration of force onto tissue reveals useful perceptual information which guides further haptic interaction making the force perception in MIS a dynamic process. We hypothesized that the compliant nature of soft tissue during force application provides biomechanical information indicating imminent tissue failure. Specifically, the relationship between applied force and material deformation rate specifies the distance remaining until the tissue will fail, which we termed distance-to-break (DTB). Attunement and calibration training was employed to investigate whether observers are able to identify material break points in simulated compliant materials through haptic force application. Findings underscore the importance of haptic invariants such as DTB and the efficacy of using simulators to train haptic skills.



**Friday, Apr. 14, 2017**  
**2:00 to 3:00 p.m.**  
**48 DeGarmo Hall**

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