

# Detecting Threat

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## Detecting Threat: Utilizing Touch Screen Responses and Eye Tracking Technology to Identify Movement Patterns During Attempts to Conceal an Unstable Device

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The goal of this research is to utilize touchscreen and eye tracking technologies to build a Behavior-Based Threat Detection Predictive Model for behaviors that are most reliably associated with attempts to conceal an unstable device. There are two primary tasks: Task 1 involves students creating a wrapper that could be used on a touchscreen-enabled device. This interface will record which particular body part is identified as the area of interest through touching the screen and the sequence of touches. Task 2 involves recording eye tracking data to assess visual search strategies and eye movements as individuals assess gait patterns that may be associated with attempts to conceal an unstable device. Utilizing these two approaches to gather decisions about gait patterns will provide insight into what people consciously attend to when identifying movement patterns that inform a threat detection assessment and what they attend to unconsciously. Ongoing research by Sweet and Meissner (2015) found that both law enforcement officers and naïve controls perform at no better than chance at threat detection and that they both have a bias toward seeing threat. By understanding what, if any, differences exist between conscious and unconscious cognitive processes this research could be used to mitigate the effects of investigator bias and improve judgment accuracy of threat detection.

- RQ1: What behaviors / movement patterns are people consciously paying attention to when performing a threat detection task? [Task 1]
- RQ2: What behaviors / movement patterns are people unconsciously paying attention to when performing a threat detection task? [Task 2]
- RQ 3: Are conscious or unconscious decision more reliable? Are people's touches on the screen correlated with their gaze patterns? [Task 1 & Task 2]
- RQ 4: In those individuals who perform at better than chance levels, what are the key behaviors that they attend to?

This research has implications for machine learning once a reliable predictive model has been developed and properly evaluated.