Visual Abstraction in Synthetic Training (VAST) Environments

2023 - Current
Project Leader: David Nelson

Background

In the line of duty, military service members and police officers have to assess threats and determine the appropriate level of response for shoot vs. don't shoot scenarios. Current state of the art training focuses on applications that often target extremes: the physical competency to engage enemy combatants vs. cognitive skills such as negotiation and diplomacy, but these approaches may not fully address the intricate decision-making challenges involved in times of extreme stress and many unknowns. Especially the integration of conscious contextual information with the subconscious visual-perceptual mechanisms involved in expert decision-making to detect threats accurately.

VAST [Visual Abstraction in Synthetic Training Environments] is a new VR-based training program deploying point-light displays as an abstraction technique to build expertise in military and police training. The point light displays present crucial cues for identifying patterns in the kinematics of individuals' movements. VAST provides an efficient and effective training approach for novices to learn how to recognize and interpret subconscious visual cues to aid in rapid decision-making scenarios.

Objectives

VAST is evaluating the effectiveness of incorporating point-light displays as an abstraction technique in training programs for military service members and police officers in primarily high stakes shoot vs no shoot decisions. Specifically, whether point-light displays can enhance expertise development in uncertain threat detection scenarios. Researchers are currently gathering evidence via a pilot training intervention study.

Results

ICT's researchers hypothesize that point-light displays will demonstrate enhanced decision-making capabilities, exhibiting higher accuracy and faster response times. This on-going study will result in academic papers which detail evidence-based findings.

Next Steps

VAST can be extended, over time, to incorporate additional scenarios that precede and follow shoot vs no shoot events, allowing further de-escalation skills and techniques to be integrated into VR training. Additionally, low fidelity

simulations like point-light display strip away details such as race and gender, allowing for research in implicit biases by having participants interact with both high-fidelity and abstracted, contextually bare models of the same stimulus.

By incorporating these diverse scenarios, VAST will provide a more comprehensive and holistic training experience to prepare military service members and police officers for a wider range of real-world encounters.

Published academic research papers are available from https://ict.usc.edu/research/publications
(Search engine keyword: USC ICT Publications)

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