

Ben-Gurion University Human Factors Engineering Center Chooses VT MÄK Products to Create a Virtual World for Hazard Perception Research

The Ben-Gurion University (BGU) Human Factor Engineering Center is a research group at Ben Gurion University, located in Israel. The Human Factors Engineering Laboratory beholds a Virtual Environment Simulation Laboratory (Dome Projection Facility) and has chosen MÄK products to enable and further its research in the area of hazard perception (HP) among child pedestrians.



The Human Factors Engineering lab has recently completed its pioneer study to examine children's ability to perceive hazards while crossing roadways. This initiative is an important first step in the attempt to find an intervention technique that may reduce child-pedestrians' over-involvement in traffic crashes.

Development of a training program requires a comprehensive understanding of child-pedestrians' traffic behavior patterns. Comparing adults and children provides a depiction of what elements in the traffic environment are crucial for the road-crossing task. In the pioneer study, children and adults participated in a two-phase experiment. They observed typical urban scenarios from a pedestrian's point of view and were required to: (1) Press a response button each time they felt it was safe to cross; and (2) Describe the features that they perceived as relevant for a



Ben-Gurion University of the Negev's Dome projection facility

safe road-crossing decision. Participants' eye-movements were recorded throughout the experiment utilizing a helmet mounted tracker.

To successfully create a safe zone for experimentation, streets, cars, trees, and various other urban elements were designed uniquely for this VR environment in a large dome.

Using MÄK's Commercial off the Shelf (COTS) products, including VR-Vantage, VR-Forces and B-HAVE, the lab was able to develop different scenarios to examine crossing behavior at various conditions. VR-Forces, MÄK's Computer Generated Forces toolkit, generated the scenarios while VR-Vantage, MÄK's visual rendering tool, was used to operate the out of the window view presented in the dome.

"VR-Forces, B-HAVE, and VR-Vantage made the perfect formula in creating our virtual world. No integration work was needed, just configuration," said Dr. Tal Oron-Gilad,



The generic city environment presented in the Dome setting from a side view.

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Ph. D, the Human Factors engineer and researcher leading the project.

This sale was facilitated by Synergy Integration Ltd., MÄK's reseller in Israel. Synergy is the leading company in Israel that actively promotes innovative concepts and technologies, including the use of commercial-off-the-shelf components. In addition to distributing and supporting COTS products, Synergy also promotes the usage of worldwide standards and integrates high-level tools for simulation, engineering analysis, and training applications.

"With MÄK's support we were successfully able to implement a COTS based solution in an academic environment. BGU's acceptance and excitement made the endeavor a great success," said Jacob Silbiger, Managing director, Synergy Integration Ltd.

The significance of this project stems from its engagement in a novel training methodology involving virtual reality capabilities. By addressing child-pedestrians' road safety behavior in off-road settings, the Human Factors Engineering is promoting the utilization of HP scenarios as a tool to train child-pedestrians to detect and predict hazardous situations.



The generic city environment presented in the Dome setting from a bird's eye view.

"Only a COTS solution like the one offered by MÄK could meet the budget constraints of our project. It was the perfect all-in-one solution at the right price," said Oron-Gilad.



Simulated environment from a child-pedestrian's point of view.