

# Visualization Development Competition 2010

Development of an Interactive Environment for Training an Operator  
of a Motorized Wheel Chair

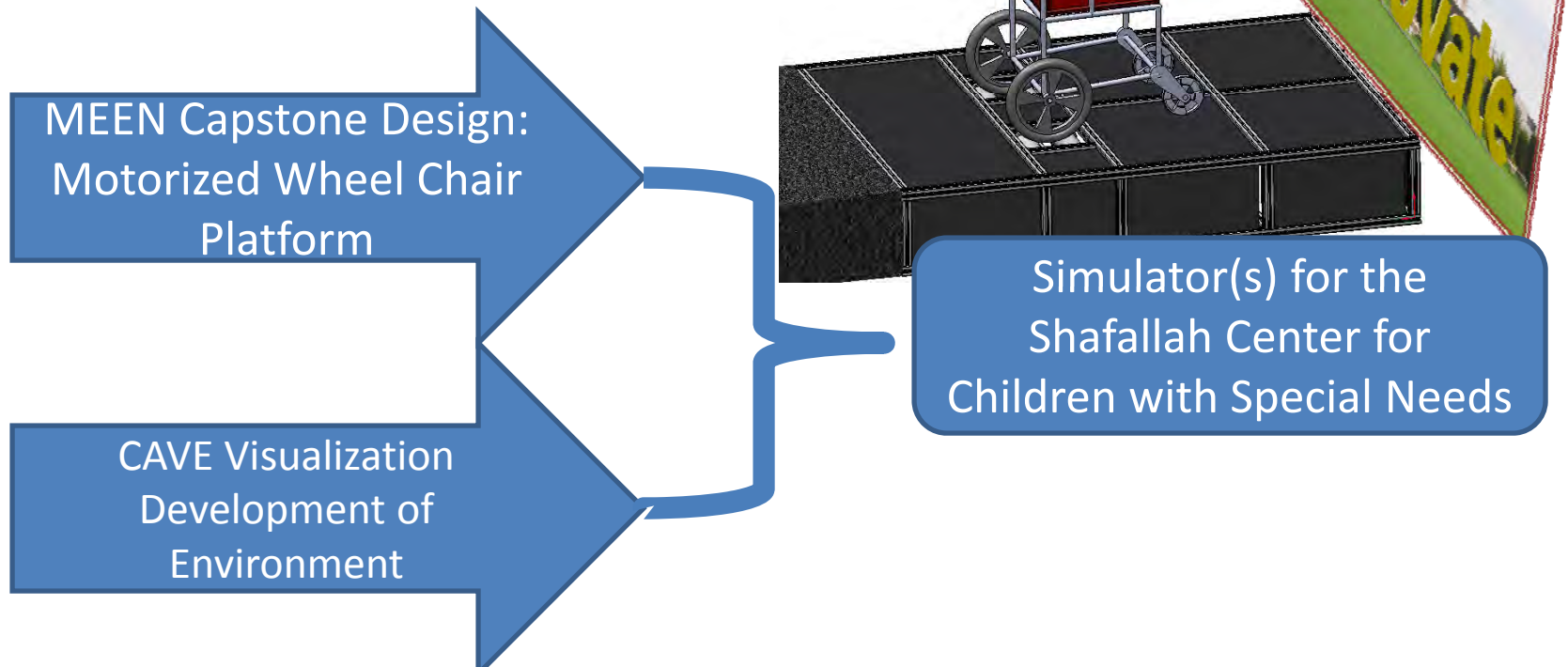
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# P11: NEED

The Shafallah Center for Children with Special Needs desire a means for training people on how to use a motorized wheel chair prior to them actually using the chair.

- Safety
- Comfort with controls
- Chair motion and response



MEEN Capstone Design:  
Motorized Wheel Chair  
Platform

CAVE Visualization  
Development of  
Environment

Simulator(s) for the  
Shafallah Center for  
Children with Special Needs

# Attributes of Joystick Simulator

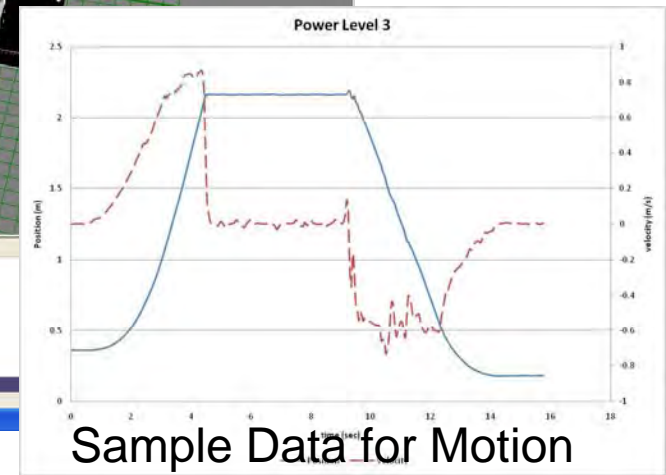
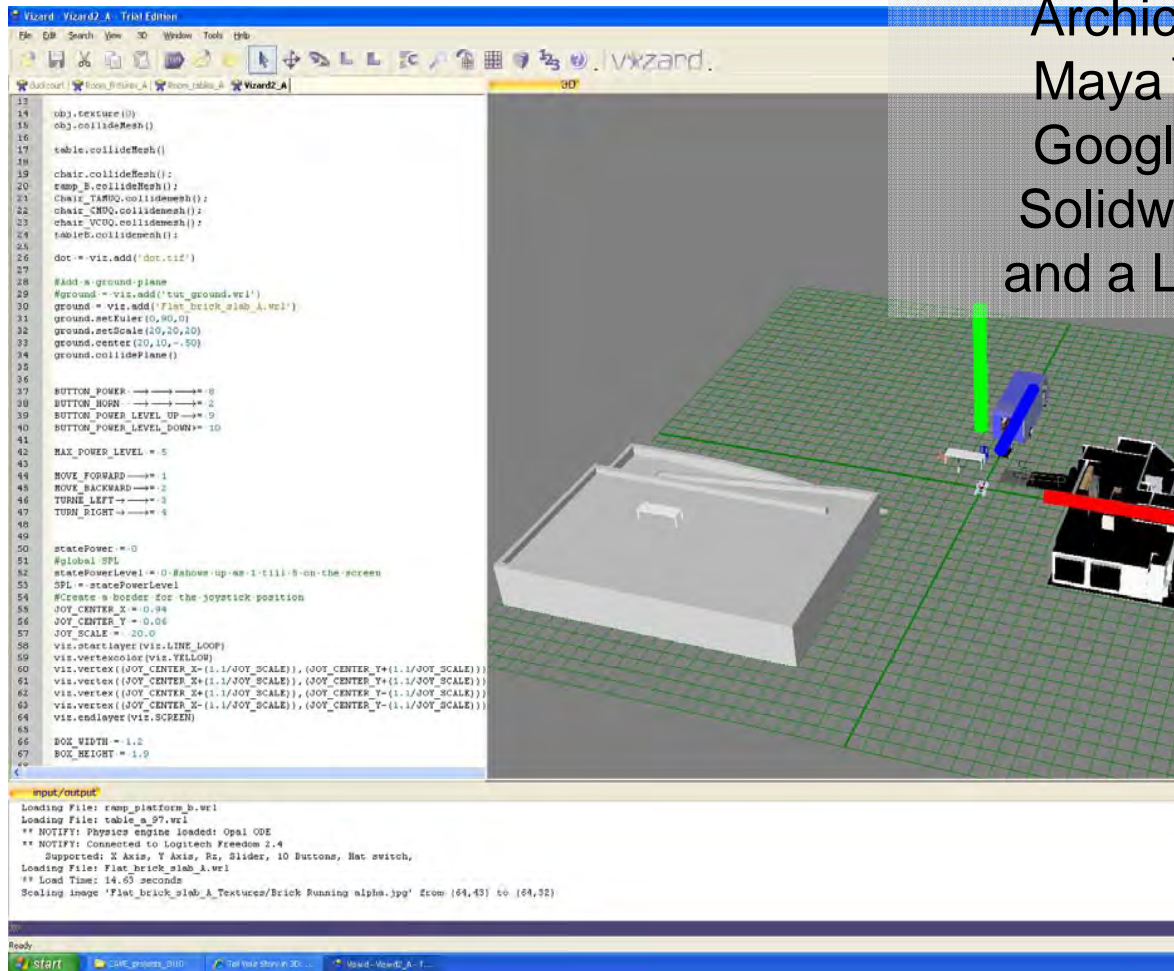
The features of the simulator need to provide

- Control of moving through environment with a joystick with similar button options as on an actual chair.
  - Horn, on/off, power levels
- Environments that require maneuvering in tight confines.
  - Rooms with tables and chairs.
  - Narrow hall ways
- Audio (horn, wheel/motor noise, collision)
- Collision detection capability
- Perception of acceleration, deceleration, and turning motion.
- Visual cues utilizing direct line of sight as well as peripheral vision.

# Resources and Environment



The project utilizes  
Vizworld™  
Archicad™  
Maya™  
Googlesketch  
Solidworks  
and a Logitech™ wireless joystick



Sample Data for Motion

## SUMMARY:

- The material developed for this project demonstrate the proof of concept of utilizing this visual environment for a training simulator.
- The use of the wireless joystick to along with sitting within the chord of the screen provides the user with the necessary environment to learn how to safely navigate and proper use of their controls.
- Future work would include hints on changing speed settings, mapping of course and monitoring performance for feedback purposes, and various environments (including dynamically changing ones) to further train them.



User in demo chair with wireless joystick navigating through a kitchen

A photograph of a modern university courtyard. On the left is a tall, light-colored building with a grid of square windows. On the right is a lower, reddish-brown building with large windows. In the foreground, there are green and purple plants in a raised bed. The sky is clear and blue.

Questions?