Facilities, Equipment, and Other Resources

Motion Simulation Laboratory
106 Furnas Hall
University at Buffalo, Buffalo, NY 14260-4200

SimRING SIMULATOR, 106 Furnas Hall

Motion/Cabin:

- Moog Motion Platform – A six degree-of-freedom motion platform powered by six DC servomotor-driven ball screw design actuators. The platform is capable of supporting up to a maximum payload of 1000 kg on a 1.84 m by 1.84 m triangular base. Individually, the angular degrees of freedom (pitch, roll, yaw) of ±22° are possible at a rate up to 30 °/s. and an acceleration of up to 500 °/s^2. Displacement degrees of freedom are approximately ±0.2 m at rates up to 0.5 m/s and 0.5 g of acceleration.
- 1999 Ford Contour Passenger Cabin – The cabin has been augmented to minimize excess weight, and includes: 2 front seats w/ seat belts, a steering wheel and pedals (see below), a full front vehicle console (for on-board instrumentation), rear and side-view mirrors (for rearward view and blind-spot verification), and an emergency stop switch.

User Controls:

- ECCI TrackStar 6000 Pedals – The unit comes with 3 floor pedals (accelerator, brake, and clutch), each spring-loaded and mechanically actuated and pressure modulated.
- Fanatec GT2 Racing Wheel – The steering unit comes with a leather steering wheel with 12" diameter, 900 degrees of angular rotation, a mechanical force-feedback capability, rear-wheel paddle shifters, and a series of buttons for driver input and feedback.

Visualization:

- M1 Interactive Ring Screen – Our visualization system consists of a circular 16' diameter, 6' high Ring Screen mounted 5 feet off the ground. This system provides the driver with a fully immersive 360 degree field-of-view while driving.
- 6x SONY VPL-FH36B LCD Projectors – Each visualization screen is front-projected with a SONY LCD projector, featuring: 3900 ANSI Lumen brightness, a 2000:1 contrast ratio, and WUXGA (1920x1200, 16:10) native resolution.
- 2x Matrox TripleHead2Go Digital Edition – external multi-display adapter that expands each graphics output channel (on the graphics card) into 3 distinct channels.
- 6x Extron 109xi Computer-Video interface – a dedicated, analog computer-video interface with Advanced Digital Sync Processing (ADSP). It allows computer-video resolutions up to QXGA to be converted for output to projectors and flat panel displays.

Sound:

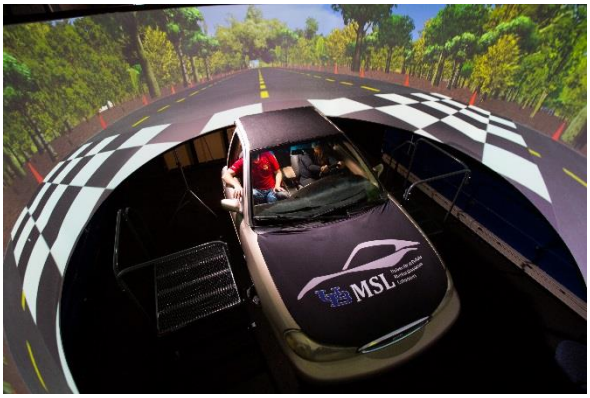
- Stereo Harman Kardon Sound System – A stereo 2.1 (front-left, front-right, and L.F.E. subwoofer) channel sound system, a 16 input channel/4 output channel mixing board, and a multi-channel ATI Power Amplifier.

Computation:

- Dell Precision T7500 Tower Workstation – A tower graphics workstation with dual-core 2.16 GHz Intel Xeon processors, 12 GB Memory, and an EVGA nVidia GeForce 590GTX graphics processor. This workstation has 6 monitors (one for each visualization screen), and controls all aspects of our motion simulations (e.g. graphics/motion/audio cueing and accompanying real-time simulation analysis).

SimRING – external view

SimRING – internal view



SimRING – Top View

SimRING – Driver View