Driving Simulator Interfaces for Intelligent Vehicle Evaluations on Heavy Duty Vehicles

Overview
More and more autonomous solutions are developed in vehicles today. These are used as a support in traffic to reduce environmental impact, congestion and accidents. For autonomous vehicles to become a reality, all systems and the driver's reactions to these has to be tested thoroughly before the vehicles is safe enough to drive on public roads.

Objectives
The main objective of this project was to develop a hardware of a desktop simulator for Heavy Duty Vehicles, more specifically long haul trucks. The project's sponsor is Volvo Trucks North America and the project group consists of students from Chalmers University of Technology and Pennsylvania State University. Another objective of the project was to offer the students a chance to experience working in a global environment.

Approach
- The customer needs considered of most importance was ease of use, flexibility, and ease of implementation.
- From these needs, six possible concepts on different simulators have been generated and evaluated in a Pugh Matrix.
- The three-screen setup was chosen and incorporates two different additions; a modified gaming steering wheel and a rack for the screens. Chalmers University of Technology students focused on the modified gaming steering wheel, and Pennsylvania State University built the rack.
- Extruded aluminum was the material selected for the rack.
- Simple strengths tests were performed and showed no measurable deformation

Outcomes
- The parts and the simulator are easy to recreate with Commercial-Off-The-Shelf parts.
- Easily portable due to wheels and foldable design
- Total cost is approximately $8,200. Cheaper than all other professional simulators on the market.
- Won BP Peoples’ Choice Award at the Senior Design Showcase