

**Increasing Vehicular Accident Preparedness  
with Virtual Reality**

Team 5.0

EE300W Section 006L Position 5

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## **Abstract**

Many people involved in major car accidents encounter a situation that they have not experienced before and are therefore prone to making mistakes during critical reaction moments that increase the likelihood of death. New drivers, particularly teenagers, would be more likely to survive fatal car accident scenarios if their reactions to dangerous on-road experiences had been practiced in a low-stakes environment before encountering them in real life. Utilizing video game and virtual reality technologies in simulations of fatal events will enable them to commit reactions to muscle memory. The survivability of high-speed incidents on roadways would be improved for new drivers. Generated user reports based on simulation activity would be a useful metric for insurance companies to provide appropriate rates to new policyholders by providing them with standardized evidence of training.

## **Introduction**

Some common situations that may result in deadly accidents include animal crossings, snow, and ice on the road, encountering dangerous highway merges, and running into wrong-way drivers. These events can be simulated in a realistic manner using commonly available technology. Providing real-time guidance in the form of onscreen tips would help beginners to avoid or manage dangerous on-road events that require spur of the moment reactions safely.

Modern virtual reality headsets such as the Oculus and PlayStation Virtual Reality (PSVR) are used regularly by teenagers for gaming. Implementing training games on these existing platforms

could be done at little cost in the home or in the school. Designing various levels meant to reinforce certain driving skills could allow for objective measures to analyze users' progress.

These user reports may be submitted to insurance companies over the internet to reduce insurance rates for parents by ensuring that teenagers added to policies meet important training guidelines. Insurance companies would be provided assurance that a newly insured driver will be a low-risk addition, thereby reducing their liability. This would financially benefit both parents and insurers by providing clear benchmarks for successful drivers, as well as providing reassurance that loved ones are well prepared for the dangers of the road.

### **Rationale**

According to the National Safety Council (NSC, 2019), Defensive Online Driving Courses exist that claim to educate participants about road safety and responsibility. 4-hour and 2-hour online programs are certified by the NSC. Users are added to a database collected by insurance companies leading to lower insurance payments upon successful participation in the course. The Defensive Online Driving Courses is convenient and authenticated by NSC; however, it cannot provide practical training. Alternatively, driver's education courses provided by state-approved traffic schools allow for similar advantages yet offer behind-the-wheel training with an instructor during which drivers learn technical driving skills. Unfortunately, this has the drawback that only very basic skills will be taught. For complex traffic conditions such as car accidents, these insufficiently trained drivers remain a danger to both themselves and fellow motorists.

A VR Driver's Ed training program would provide all of the benefits of existing educational tools while minimizing the drawbacks. This tool only requires a VR set, a steering wheel, and the training program, at a total cost of less than \$400.00. Users can access traffic scenarios designed around real car accidents along with expert advice on navigating around them. Trainees could receive guidance from Formula 1 race car drivers about handling high-speed collisions while in the midst of a simulated replication of one. By consulting such experts during scenario design, users would be assured of the quality of their educational experience. This tool can additionally be certified by the state Department of Motor Vehicles and NSC. Drivers will act better and faster when they confront unsafe events on the road if they have practiced before. Additionally, the database will be accessible to insurance companies to help them adjust insurance rates according to a trainees performance.

## **Implementation**

A virtual reality system will be built using Autodesk software (Autodesk, 2019). The tool will be compatible with Oculus and PSVR, the most commonly used VR headsets on the modern market to increase consumer availability (Horwitz, 2018). The VR system will imitate real life scenarios based around accidents most commonly resulting in deadly accidents. The setting for accidents can be modeled based on Google Earth to provide highly realistic experiences.

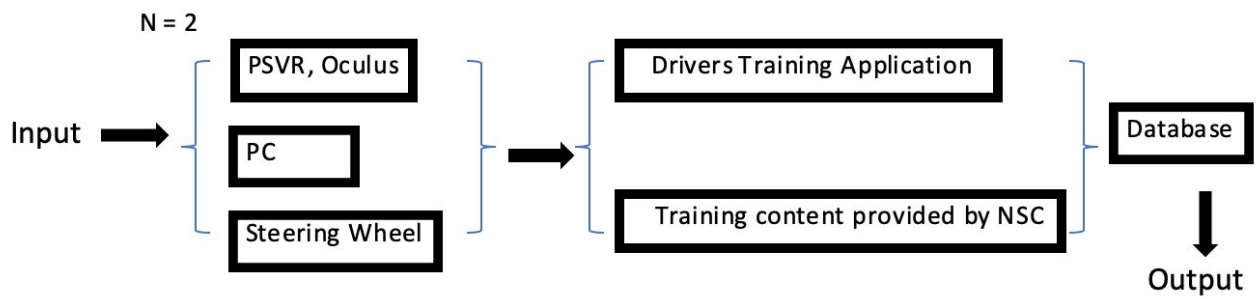
Additionally, the product will be tested by stakeholders including insurance companies. By employing data-driven techniques including scientific studies to assess correlations between product usage and the likelihood of future accidents, users can be assured of the product's

viability. Upon completion of the course, the hardware can be used for other purposes of VR. The technology can be implemented in the home or in school with little initial investments.

## **Conclusion**

By adapting existing technology in an innovative way, our roads may become safer places for our loved ones, and the affordability of car insurance can be increased. By allowing teenage drivers to fail in deadly on-road scenarios in a safe and zero-risk environment, they can learn to adapt and maneuver to safety when experiencing high threat, real-life situations. Fewer roadside deaths would occur, and society would be safer for future generations.

## Appendices



## References

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