



## Executive Summary

# Distracted Driving Recognition Model Using Learning Machine

### Innovation

Distracted driving has been one of the most common issues surrounding our daily use of vehicles. This technology encompasses a method using machine learning to predict different distraction patterns associated with different roads and driving environments. Specifically, the invention is a support vector machine model that predicts distracted driving by individuals on freeways, urban arterial roads, rural roads, and local roads in a school zone. In addition, the model is being extended to recognize if drivers are distracted based on their driving performance and the type of distraction, including texting, handheld phone call, hands-free phone call, voice command, and eating/drinking. There are three primary forms of distraction: visual distractions, manual distractions, and cognitive distractions. While each type of distraction may lead to a crash, all three forms of distraction may occur simultaneously because individuals hold the distracting device, look at it, and think about the next action.

### Market Need

With the rapid development of technology, automotive manufacturers now have the capability to implement more safety features than at any time before. Automated vehicles are the product of these applications using a combination of data and hardware such as cameras and lidar sensors (a variable distance range measuring sensor) to make the driving experience as safe as possible. This innovation contributes to this need for more efficient safety features. This innovation provides Morgan to make its mark in the Drive Monitoring Systems industry, which was estimated at \$1.06 billion in 2020 and projected to be \$2.39 billion in 2027.

### Intellectual Property

An Intellectual Property Disclosure was submitted to Morgan State OTT in October 2019 and a US Provisional Patent Application was filed in January 2020. A non-provisional patent (#17/389,741) was filed in July 2021.

### Stage of Development

A machine learning model that recognized hand-held voice calls, text distraction, and taking on/off clothes, using multiclass classification techniques, initially resulted in a 62% accuracy rate. Using a larger data set of driving simulator or real-world data could help improve the distraction detection model.

### Technology Transfer Opportunity

This comprehensive distraction recognition model has the potential to be commercialized as an after-market warning system as a distraction warning system to reduce distraction and crashes. It can also be utilized by police departments and insurance companies to find the driver at fault when crashes occur.

### Key Investigators:

- Dr. Mansoureh Jeihani
- Samira Ahangari
- Abdollah Dehzangi
- Arsalan Hassan Pour

### Field(s) of Use:

- Transportation
- Computer Science

### Key Words:

- Machine Learning
- Distracted Driving
- Automobile Accidents

### Advantages:

- Helps to reduce accidents
- Identifies distractions and can provide warnings
- Assesses multiple factors/causes

### Status:

[U.S. Patent Pending](#)

### Links:

[Inventor Bio](#)

### Reference Number:

089/2020

### Tech Transfer Contact:

[Ray Dizon](#)