






Final Year Project Showcase Batch-2019 Year 2023

Department: Electronics Engineering Programme: Electronics Engineering	
1	Project Idea <p>We aim to develop a lane detection warning system and a robust algorithm to ensure real-time detection. This system assists or warns a driver when the vehicle begins to move out of its lane. We have also detected rear vehicles in order to avoid a collision while changing lanes.</p>
2	Process <ul style="list-style-type: none">• Preprocess the input images to enhance lanes• Train deep neural networks for lane detection on data sets.• Validate metrics selection• Validate the trained models on benchmark dataset• Design the lane departure rule set• Implement and integrate the lane departure rule set with the trained network• Train and test the deep neural network for rear vehicle detection• Implement the rear vehicle detection model with main network• Validation of complete proposed system on Jetson nano.
3	Outcome <ul style="list-style-type: none">• It provides safety feature to the vehicle leads to reduce accidents• Rear vehicle detection also assists the driver while changing lane which also helps in reducing rate of accidents
4	Evidence (Theoretical Basis) <p>Lane departure is a leading cause of traffic accidents, often resulting in fatalities. The Lane Departure Warning System (LDWS), a component of advanced driver assistance systems, aims to address this issue by alerting drivers about lane deviations. It is designed to enhance road safety by providing drivers with real-time information and even taking control of the vehicle when needed, thereby offering a safer, more convenient and efficient mobility solution.</p> <p>Advanced technologies such as lane detection and warning systems have been developed in the computer vision and artificial intelligence domains. Utilizing computer vision techniques, lane detection examines still images or video clips taken by cameras mounted on moving cars. The computer vision techniques help distinguish lane markings from other objects in the scene. In improving the accuracy and robustness of lane detection systems machine learning plays a crucial role. Machine learning models trained to automatically learn the characteristics and patterns of lane markings from labeled training data. Convolutional Neural Networks (CNNs) are commonly used in lane detection tasks to learn hierarchical features and make predictions based on input images.</p> <p>The proposed methodology involves preprocessing input images, training a lane</p>



	<p>departure model through CNNs, analyzing image patches to identify lane markings, classifying images, validating and training the CNN model. Implementing rule sets for the monitoring system, integrating a YOLO model for rear vehicle detection, executing system validation on Jetson Nano hardware, and finally creating a Lane Departure Monitoring System with real-time warnings and rear vehicle detection capabilities.</p> <p>The Lane Departure and Monitoring System stands as a powerful example of how technology can revolutionize road safety. By actively preventing lane departure incidents and promoting cautious driving behavior, this system has the potential to save lives and prevent accidents. Moving forward, collaboration between automakers and researchers will be crucial to fully realizing the transformative potential of this groundbreaking technology.</p>	
5	<p>Competitive Advantage or Unique Selling Proposition (Cost Reduction, Process improvement, Attainment of any SDG (Sustainable Development Goal), increase of market share or capturing new market or having superior performance over a competitor. In summary, any striking aspect of the project that compels the industry to invest in FYP or purchase it. Some detailed description is required in terms of how, why when what. You can select one or more from the following dropdown and delete the rest of them). Please keep relevant options, delete the rest of them, and correct the sequence</p>	
a	<p>Attainment of any SDG (e.g. How it is achieved and why it is necessary for the region)</p> <p>This project will ensure real-time detection of the road lanes. This provides safety and comfort during a long journey. The proposed system will warn the driver when they unintentionally leave the lane. As a result, driving mistakes will be minimized. Usually, traffic accidents are caused by vehicles deviating from the driving lane. Therefore, this technology was introduced to reduce human error. By warning the drivers, the probability of traffic accidents can be reduced. It will also improve road traffic to a certain extent.</p>	
b	<p>Any Environmental Aspect (e.g. carbon reduction, energy-efficient, etc.)</p> <p>Reduce accidents by assisting the driver</p>	
f	<p>Capture New Market (e.g. Niche market or unaddressed segment)</p> <p>Micro-start ups related to cars.</p>	
6	<p>Target Market (Industries, Groups, Individuals, Families, Students, etc) Please provide some detail about the end-user of the product, process, or service</p> <p>Automotive Industry</p>	
7	<p>Team Members (Names along with email address)</p>	<p>Maliha Siddiqui (siddiqui4201358@cloud.neduet.edu.pk) Fizza Fatima (fatima4230093@cloud.neduet.edu.pk) Safa Asif (asif4200069@cloud.neduet.edu.pk) Umme Hafsa (hafsa4201719@cloud.neduet.edu.pk)</p>
8	<p>Supervisor Name (along with email address)</p>	<p>Dr Yawar Rehman (Email:-reh.yawar2@gmail.com)</p>



10	Pictures (If any) 	
11	Video (If any)	 Project Video.mp4  Project Video2.mp4 -