

## ARTIFICIAL NEURAL NETWORK MODELLING APPROACH FOR PREDICTION OF ROAD ACCIDENTS

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### Abstract

Road accident is a major social problem in the developed countries of world for over fifty years. Mitigation of road accidents is one of the main factors of concern in any road safety program. Since the invention of motor vehicles, road accidents took more lives than World War 1 and 2 put together. The World Health Organization (2007) estimated that annually around 0.45 million people die and 18million people get injured due to road accidents. Hence, it is imperative to identify road sections which are causing or will cause more accidents in terms of number or severity in a better way. In the past decades developing countries like India began to experience increasing in the number of road accidents taking place and found it necessary to institute road safety programs. It is strongly felt that most of accidents being a multi factor event are not merely due to drivers fault on account of driver's negligence or ignorance of traffic rules and regulations, but also due to many other accident causative factors related such as road geometrics, vehicle characteristics, traffic flow characteristics road user's behavior, climatic conditions, visibility and absence of traffic guidance, control and management devices, etc., which contribute directly or indirectly to the road accidents. The purpose of this study is to investigate the relationship between causative factors of accidents and the driver's injury severity which contribute directly or indirectly to the road accidents. Firstly, student T-test is performed to identify the vital causative factors of accidents. After identifying

the vital causative factors obtained from Student T test, the accident data is collected from different police stations on the selected stretch of a National Highway under the study. Secondly, the prediction of driver's injury severity (fatal, severe, non fatal) is modeled using artificial neural networks (ANN). Different causative factors are taken as an input variables and driver injury severity is taken as an output variable for modeling with ANN. Finally, the dependency of input variables on the output variable is calculated through coefficient of correlation and mean square error. It is found that driver's injury severity is significantly influenced by time of accident, type of vehicle, person driving vehicle, nature of accident and age of the driver.

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Key Words : *Road accident, T-test, Causative factors, Driver's injury severity, Neural Networks.*

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