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Automotive Anti-Theft System Using Fuzzy Logic Method

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Automotive security has become more challenging with the increasing of sophisticated modern technologies nowadays. While the transformation of automotive has brought major advancement in efficiency, it also led to the possibility of new threats in automotive field such as vehicle theft. In Malaysia, an average of sixty vehicles get stolen every day. Numbers of vehicle's security and safety devices or system has been marketed such as safety alarms, door jammer, gearshift lock and global positioning system (GPS) tracker. However, there are also few limitations of these devices such as easily disable, notify false alarm and requires strong cellular network for continuous tracking. This paper describes the preliminary research and application of fuzzy logic based controller for braking system of stolen vehicle. In our future study, this system will be incorporated in the anti-theft tracking device with smartphone integration. In this study, two input parameters are considered which are the vehicle velocity and the sight distance. The proposed system will assist the user or vehicle owner to decide for safe braking control. Thus, reduce the risk of property loss or life loss.

Keywords: Automotive Security, Anti-Theft System, Fuzzy Logic Controller, Braking System, Computational Intelligence

1. INTRODUCTION

Automotive security has always been considered as a critical engineering concern. Although many latest software and devices has been introduced to increase safety¹, it is still vague whether the manufacturer of vehicles has anticipated the possible adversary in their design. The growing of computerized control has also leads to corresponding array of potential threats²⁻⁶. While the transformation of automotive has brought major advancement in efficiency, it also led to the possibility of new threats in automotive field such as vehicle theft.

Since past few years, lots of vehicle theft have been reported mainly involving vehicles with low security and

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safety preventions, thus, creates worries among vehicle owners. Also, this issue has become a major concern to commercial vehicle security^{7, 8}. Aside of property loss, this crime has also caused to life loss. According to Commercial Crime Investigation Department, an average of 60 vehicles are stolen every day in Malaysia⁹. Inevitably, public awareness on vehicle safety is extremely needed to curb the menace of vehicle theft.