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# CONTENTS

CHAPTER ONE: Mechatronics System Design and Applications

## CHAPTER TWO: Modelling and Simulation



## CHAPTER THREE: Intelligent Systems

CHAPTER FOUR: Instrumentation, Dynamics and Control

CHAPTER SIX: Speech and Image processing



CHAPTER SEVEN: Robotics and Automation

## CHAPTER EIGHT: MEMS and Materials

## CHAPTER NINE: MEMS and Materials

## CHAPTER TEN: MEMS and Materials



## CHAPTER ELEVEN: MEMS and Materials

# AUTO CRUISE SYSTEM: A SYSTEM TO ASSIST DURING TRAFFIC CONGESTION

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## ABSTRACT

A low cost auto cruise system is developed and tested in this paper. This system is to assist drivers at speed below 30 km/h, which is the case during traffic congestion. The current system is developed for auto transmission cars and gear-changing mechanism is not addressed by this system. Two proximity sensors are used to measure leading car's distance and send to the system controller. Controlled output signal is send to an actuator to control brake and accelerator pedals. Both pedals are controlled using only one servomotor. Simulation studies for this model are carried out with MATLAB and LabVIEW software and implemented on a prototype using a microcontroller from MOTOROLA. Experimental results propose the modeled system is feasible and can be realized on a real car.

## 1.0 INTRODUCTION

Auto cruise system is a good example of Mechatronics system as it comprises of electronics, mechanical and control subsystems. Cruise control systems have been in the industry for years. Despise of their usefulness, the usage is limited by the cost. Most auto cruise systems are costly and used to control high speeds. As given in [9], RW and Delphi Automotive Systems have developed an 'Advanced Adaptive Cruise Control' which is currently implemented on Mercedes-Benz and 2000 Jaguar XKR aimed at speeds ranging from 30 km/h to 180km/h.

A low cost cruise system particularly for low speed is necessary to address drivers' stress during traffic congestion. The need of having such system has motivated this work and in fact dilemma between high technology, lower cost and problem solving are very crucial aspect for automotive industries.

The cruise system designed here has two inputs namely, speed of current car and distance between current and leading car. Both inputs are given to controller to produce a controlled input to an actuator that controls both accelerator and brake pedals. Based on the two above-mentioned inputs, the controller is aimed to maintain speed below 30km/h, which is the case during traffic congestion.

A servomotor is used as the actuator to control both pedals, but one at a time. This is due to the fact that the both pedals are not used simultaneously. The direction of motor rotation determines the pedal mechanism; that is the pedal selection and its movement measure.

This paper is organized as follows. Section 2 gives a brief description on system design and its layout while section 3 explains on how the signal is encoded and the flowchart of the whole system. The derivation of the mathematical equations and the controller determination are mentioned in section 4. Section 5 presents the results, followed by the conclusion in section 6.