FINAL YEAR PROJECT REPORT

"Implementation of Kalman Filter Using Gyroscope"

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We pray that this effort may become the beginning of new era for Pakistan; we will be the pioneer of Science and Technology in a decade.

Thank You

Abstract

The Project serves the study of Kalman filter and its implementation on Microcontroller. We have successfully develop its application by implementing it on microcontroller developed a stable system by using MEMs based Accelerometer and Gyroscope. Kalman Filter implemented for error compensation in the sensor values. This project has vast applications ranging from robotics to complete self-balancing and very important step forward towards the industry having motion sensing base applications. This is the era of automation, hence Autopilots, Drones, Quad Copters are heavily using IMU to stable their system.

CHAPTER ONE

Introduction

Introduction:

Now a day technology is improving so rapidly. You can see the evolution of technology from Horse drawn carriage to Motorcars and from Motorcars to Air planes. In a decade from Motor Cars to Unmanned Ground Vehicle and Airplanes to Unmanned Aerial vehicle People involvement is Lessing by year and machines involvement is increasing for easiness of life. Machines don't see or listen, so sensors work on behalf of eye and ear which transducer the mechanical or visual in analog electronic signal. What we have done is developed a stable platform by using IMU. We have used accelerometer and gyroscope to obtain angel by Pythagorean theorem with respect to gravity but thing is this angle contain too much noise that cannot stand in real world so we need an algorithm that lesser the noise of accelerometer and match with real world so we used Kalman filter. This purpose can be achieved by an ordinary filter that can correct the angle but Kalman filter take lead in the estimation part. Because Kalman filter algorithm is based on correction and estimation. Estimation portion is used in controlling the drift of gyroscope.

Tracking objects in image sequences is an important task for vehicle guidance, following moving objects or to obtain a description of an environment. In most systems the first step in tracking objects is to separate the foreground from the background or to detect motion. This means to detect the regions (Apparent shape) of independently moving objects regardless of their speed, direction or texture. In this work we assume that the image sequences are taken by a stationary CCD camera with fixed focal length.