100-1 Preliminary Syllabus, Da-Yeh Univ

Information			
Title	智慧型汽車之控制設計:TWN	Serial No. / ID	1374 / EDR5180
Dept.	電機工程學系博士班	School System / Class	研究所博士班1年1班
Lecturer	吳幸珍	Full or Part-time	專任
Required / Credit	Optinal / 3	Graduate Class	No
Time / Place	(二)34N / H371	Language	Other

Introduction

This course is to provide graduate student the systematic design of the automatic driving system embedded in the smart car Taiwan iTS-1. Taiwan iTS-1 is a heterogeneous system including various sensors, core controller, interfacing and mechanisms to carry out automatic driving. A hierarchical-control autonomy structure to achieve integrated longitudinal and lateral control on highway and urban-road environments. Upper-level control analyzes the traffic situation, determines a driving mode and reference signals. Vehicle-body control ｅｘｅｃｕｔｅｓ real-time control-signals tracking. Both human intelligence and behaviors are integrated into vehicle-body control. Collision warning and avoidance maneuvers are embedded in this car. Furthermore, passengers ’ comfort is also considered in design.

Outline

I. Introduction
1. Mastering Simulink
2. Introduction to CarSim
3. Vehicle Dynamics Simulation using CarSim
Scene Setup
Scene Setup
4. Introduction to Automatic Driving System
II. Autonomous Driving System
5. Vehicle Overview
6. Lane-keeping Design
? Vision-based system
? DSP-based system
7. Lane-changing Design

8. Car-following Design
? ICC mode
? ACC mode
? Platoon mode
? Stop-and-Go
III. Driving Assistance System
9. Collision Warning/Avoidance Maneuver

10. Comfort Estimation
11. Integrated Lateral and Longitudinal Controller
Final Examination (CarSim Demo)

Prerequisite

no