

98-2 大葉大學 完整版課綱

基本資訊

課程名稱	智慧型汽車之控制設計:TWN	科目序號 / 代號	1816 / EEI4253
開課系所	電機工程學系	學制 / 班級	大學日間部4年1班
任課教師	吳幸珍	專兼任別	專任
必選修 / 學分數	選修 / 3	畢業班 / 非畢業班	畢業班
上課時段 / 地點	(三)234 / H371	授課語言別	中文

課程簡介

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.

課程大綱

- 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
 - . Driving Assistance System
 9. Collision Warning/Avoidance Maneuver

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

基本能力或先修課程

no

課程與系所基本素養及核心能力之關連

- 2.1. 電機工程專業知識與應用能力
- 3.1. 蒐集資料、模擬分析、設計實驗及解決問題之能力
- 3.2. 執行工程實務所需之技術及實作之能力
- 4.1. 電機專業英語之基本能力

成績稽核

教科書(尊重智慧財產權，請用正版教科書，勿非法影印他人著作)

書名	作者	譯者	出版社	出版年
無參考教科書				

參考教材及專業期刊導讀(尊重智慧財產權，請用正版教科書，勿非法影印他人著作)

書名	作者	譯者	出版社	出版年
無參考教材及專業期刊導讀				

上課進度

週次	教學內容	分配時數(%)				
		講授	示範	習作	實驗	其他
1	Introduction、Mastering Simulink	50	0	50	0	0
2	Mastering Simulink	50	0	50	0	0
3	Introduction to CarSim	50	0	50	0	0
4	Vehicle Dynamics Simulation using CarSim	50	0	50	0	0
5	Introduction to Automatic Driving System	80	0	20	0	0
6	Autonomous Driving System Vehicle Overview	80	0	20	0	0
7	Lane-keeping Design : Vision-based system、DSP-based system	80	0	20	0	0
8	Lane-keeping Design : Vision-based system、DSP-based system	80	0	20	0	0
9	Lane-keeping Design : Vision-based system、DSP-based system	80	0	20	0	0
10	Lane-changing Design	80	0	20	0	0

11	Car-following Design : ICC mode、 ACC mode、 Platoon mode、 Stop-and-Go	80	0	20	0	0
12	Car-following Design : ICC mode、 ACC mode、 Platoon mode、 Stop-and-Go	80	0	20	0	0
13	Car-following Design : ICC mode、 ACC mode、 Platoon mode、 Stop-and-Go	80	0	20	0	0
14	Driving Assistance System:Collision Warning/ Avoidance Maneuver	80	0	20	0	0
15	Comfort Estimation	80	0	20	0	0
16	Integrated Lateral and Longitudinal Controller	80	0	20	0	0
17	Integrated Lateral and Longitudinal Controller	80	0	20	0	0
18	Final Examination (CarSim Demo)	0	0	0	0	100
