

智慧化駕駛輔助系統關鍵技術計畫(Fy104-105)

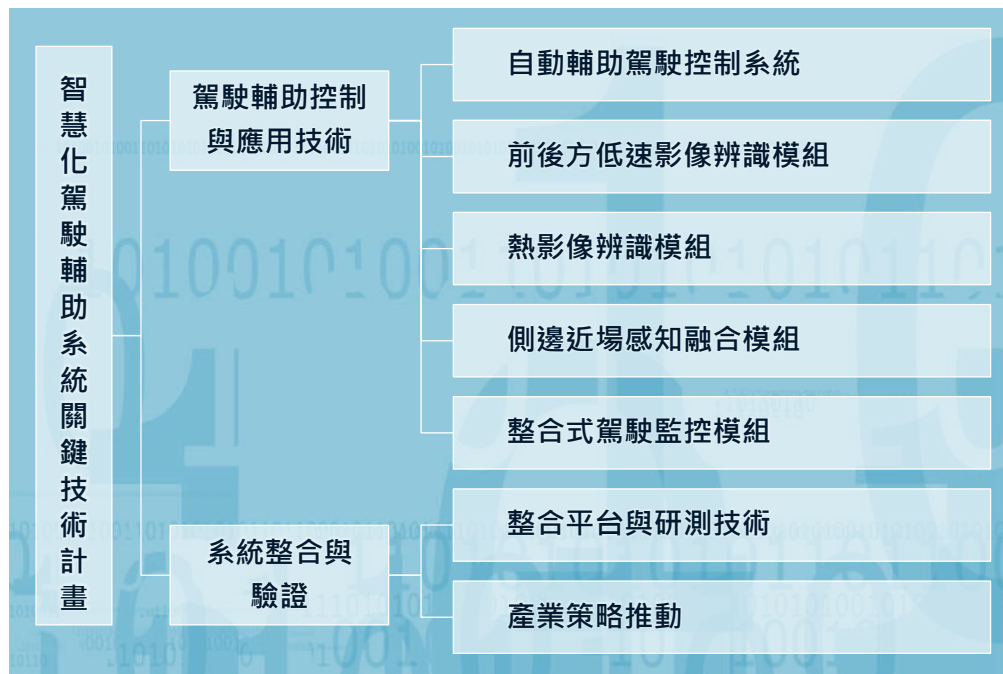
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計畫
重點

本計畫目標為開發智慧化自動駕駛輔助系統(ADAS)、智慧化感知融合模組與主動安全高階控制技術。提供車輛行駛之環境空間與障礙物資訊，輔助車輛控制決策之判斷，實現自動輔助駕駛系統(停車場域與固定場域情境)，推動ADAS產業交流平台，建構國內自主智慧車電系統產業鏈與產品合作開發模式，加值自主整車邁向國際。

【計畫架構圖】



【97件專利申請】

決策與控制(9)

自動停車軌跡修正、
駕駛決策等技術

感知與融合(67)

Radar/ Lidar/
Camera等感知與
融合技術

其他(21)

定位方法、人機顯
示、車用分散式網
路管理等技術

【關鍵技術應用】



應用於自動輔助駕駛
系統(停車場域)



應用於障礙物偵測

計畫執行成果

技術開發

- **自動駕駛輔助系統**：發展路徑規劃、決策研擬與軌跡控制演算法，整合智慧化感知融合模組，建立自動駕駛輔助控制系統，於停車場域情境進行自動停車。
- **智慧化感知融合模組**：運用感知器Radar/ Lidar/ Camera，開發前後方低速影像辨識、熱影像辨識、側邊近場感知融合模組，及整合式駕駛監控模組，精確掌握行人、車輛、障礙物等道路與環境資訊，並具備駕駛者生理異常預測與警示功能。
- **全方位障礙物偵測整合平台**：運用車用OSEK開放式網路架構，整合各項智慧化感知融合模組，完成6項共用通訊函式設計，提升車輛相關系統搭載相容性。

- 「**駕駛生理識別暨監控系統**」獲2015年瑞士日內瓦發明獎金牌。
- 「**A Novel Controller Design for Collision Avoidance Systems Using Sensor Fusion Method**」獲2015年ITS智慧運輸論文獎。
- 「**應用於前方障礙物偵測之感知融合方法**」獲2015年車輛工程研討會優秀論文。
- 「**多焦點聚光生理感測裝置**」獲2016年台北國際發明競賽金牌。
- 「**停車引導方法及裝置**」獲2016年國家發明創作獎之發明獎銀牌(發明專利)。

亮點成果

- **促成1家新創公司成立**：於2016年3月成立「慧展科技(股)有限公司」，其核心技術來自本計畫研發成果的技術移轉，產品定位為前方防撞、自動緊急煞車、影像式駕駛監控三大主軸。於2016年底推出「智慧型前方安全行車紀錄器」，攻入台灣、日本及東南亞市場，目前已有銷售實績。並於2017年起發展自動緊急煞車技術，未來規劃結合車廠廠規進行系統檢測驗證，以利快速打入OEM市場。

技術獲獎



Intelligent Automotive Electronics Technology Project (Fy104-105)

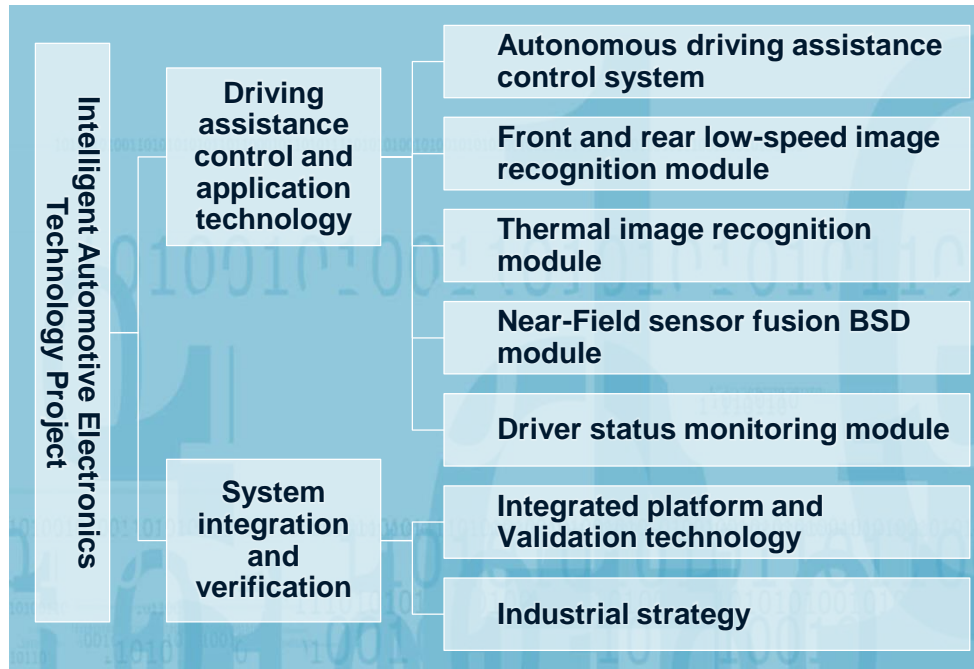
Project Leader : Liao Ching-Chiu, Executive Vice President /ARTC

Project Member : ARTC 、 ITRI 、 NCSIST 、 MIRDC

Key
point

The project aims to develop intelligent autonomous driving assistance system(ADAS), sensor fusion modules and active safety control technology. It provides fully information of the driving environment and obstacles for driving decision, and implement autonomous assistance driving system (parking area and fixed route scenario). Further more, to drive the ADAS industry platform, which help completing Taiwan's supply chain of intelligent automotive electronics technology products and creating co-development model. In this way, it will add value to Taiwan product and explore the worldwide market.

【 Project Architecture 】



【 97 Patent Applications 】 【 Critical Technology Applications 】

Decision and Control (9)

Path planning of Automatic parking, driving decision, etc.

Perception and sensor fusion (67)

Radar/ Lidar/ Camera perception and sensor fusion, etc.

Else (21)

Positioning, Human-machine interface, distributed network, etc.



Used in automatic assistance driving system (parking area scenario)



Used in obstacle detection

Project Achievement

Tech- nology

- **Autonomous driving assistance system** : Developing path planning, decision making, trajectory control algorithms, and integrating sensor fusion modules to establish autonomous driving assistance control system, which has the auto-parking ability in a parking space.
- **Intelligent sensor fusion modules** : Using radar, lidar, camera and other sensors to develop sensor fusion modules. It can assist the ADAS to analysis all the environment information of pedestrians, vehicles, obstacles, etc.
- **Integrated platform of obstructions detection** : Using open networking of OSEK to integrate all kinds of sensor fusion modules in this project, and also coding six public communication functions to improve compatibility of different systems.

- The “**Driver physiology recognition and monitoring system**” was awarded with gold medal at the 2015 Geneva Inventions.
- The “**A Novel Controller Design for Collision Avoidance Systems Using Sensor Fusion Method**” was awarded with best paper at the 2015 ITS World Congress °
- The “**Sensor fusion for front obstructions detection**” was awarded with best paper at the 2016 National Conference on Vehicle Engineering.
- The “**Multi-sensor Driver Monitoring System**”, and the “**Steering Torque and Angle Sensor**” were awarded with gold and silver medal respectively at the 2016 Taipei INST.

High- light

Incubates the startup : “ Winwise Technology Co.,Ltd ” was founded in Mar 2016, With the core technologies from this project, Winwise launched the first product “ADAS DVR” which combined the ADAS & DVR function together and sold to Japan and Southeast Asian successfully. It also start to develop AEB system in 2017. In the future, Winwise will cooperate with car maker or OE suppliers to test and verify the developed system, to enhance international competitiveness. °

Award

