

Introduction of Smart Zebra Crossing System



Working closely with Leishen to supply & service Lidar sensor and systems in ANZ region.



1

Background

2

System introduction

3

Application examples



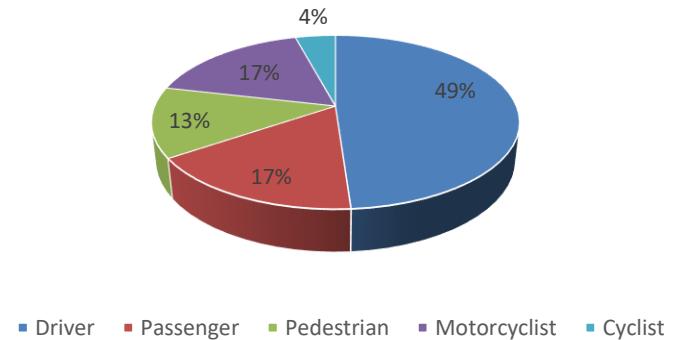
1

Background

1. Background

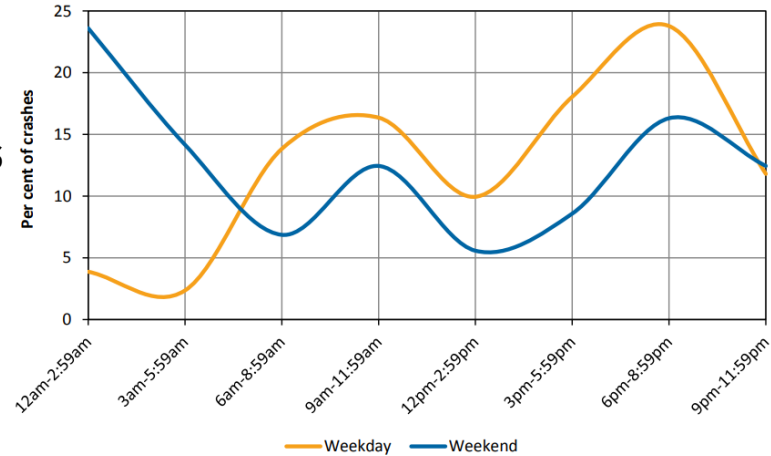
From July 2019 to July 2020, there were 146 pedestrians lost their lives in traffic accident, which contributes more than 13% of total fatalities on roads.

Road deaths by road user in Australia
From July 2019 to July 2020



Source: [Australian Road Deaths database](#) as at 20-Aug-2020

The statistics also shows that crashes involving a pedestrian fatality peak between 6pm and 8:59pm on weekdays, and between 12am and 2:59am on weekends during night time.



Quoted from <Pedestrian and Road Safety> By Bureau of Infrastructure, Transport and Regional Development – Australian Government

The Smart Zebra Crossing System is introduced to reduce the chance of accidents by giving out the advance light or sound warning to both the drivers and pedestrian.



2

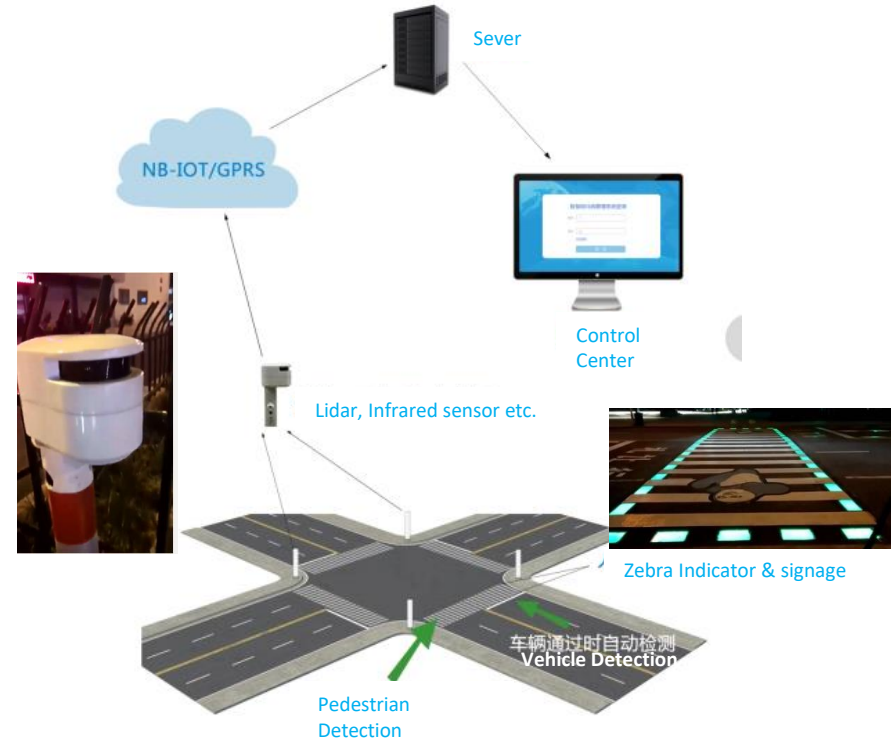
System Introduction

Architecture of Smart Zebra System

2.1 system architecture

The entire smart zebra crossing system includes parts: sensor system (lidar and other sensors), smart zebra indication system, communication infrastructure, self-test system, server etc.

The system architecture diagram is shown in figure in the right.



2.2 System Working Methodology

1. The lidar sensor will detect pedestrians and vehicles approaching the crossing area and send the information to system;
2. The system will send the signal to the smart zebra to light up indicators and signages to warn both pedestrian and drivers and reduce/avoid the chance of traffic accidents;
3. Extendibility of the system:
 - 3.1 Traffic light control can also be integrated into the system;
 - 3.2 In future, pedestrian detection information can also be transmitted to smart vehicles to remind the driver or reduce the speed in advance automatically.



2.3 System Composition

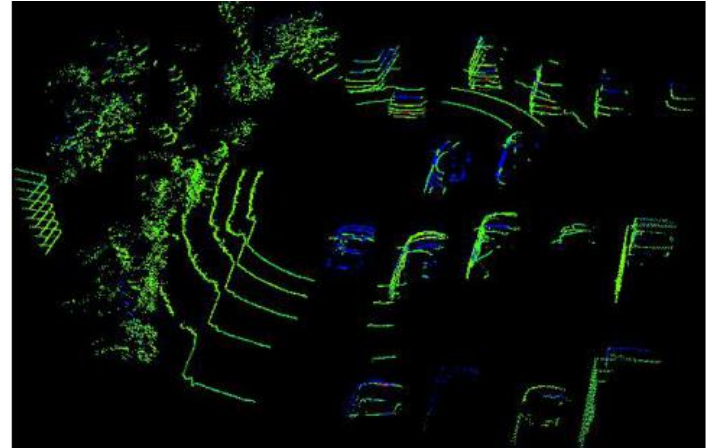
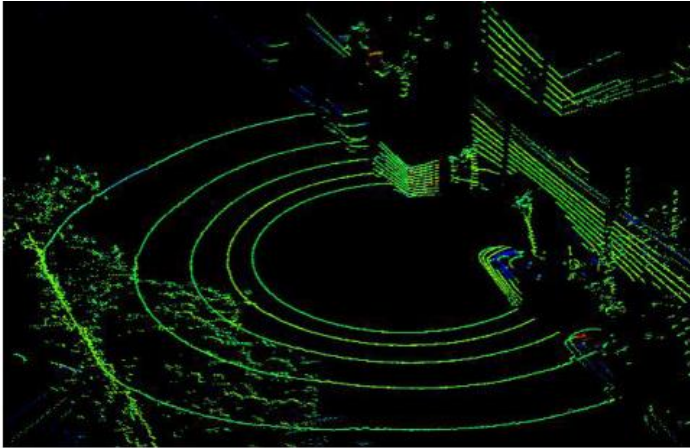
Lidar sensors:

Leishen MX- C series 360° multi-line LiDAR is ideal for this application can acquire the information of road environment in real time, analyses the relative position relationship of all vehicles, non vehicles and pedestrians on the road in real time, judge the hazard coefficient of obstacles, and effectively carry out early warning. Key features of MX-C16 are shown in the table in the right side.

| | | | | | |
|------------------------------|------------|---|-----------|-----------|-----------|
| Model | | C16 | | | |
| Channel | | 16 | | | |
| Measurement Technique | | Time of Flight (TOF) | | | |
| Wavelength | | 905nm | | | |
| Laser Product Classification | | Class 1 Eye-safe/ IEC 60825-1:2007 & 2014 | | | |
| Measurement Range | | 70m / 120m / 150m | | | |
| Ranging Accuracy | | ±3cm | | | |
| Data Points Generated | | 320,000 points per second | | | |
| Rotation Rate | | 5Hz , 10Hz , 20Hz | | | |
| Field of View (FOV) | Horizontal | 360° | | | |
| | Vertical | -15°~ 15° | -14°~ 16° | -15°~ 15° | -10°~ 10° |
| Angular Resolution | Horizontal | 5Hz: 0.09° / 10Hz: 0.18° / 20Hz: 0.36° | | | |
| | Vertical | 2° | | 2° | |
| Operating Voltage | | 9V~ 36VDC | | | |
| Communication Interface | | Ethernet , PPS | | | |
| Operating Temperature | | -20°C ~ 60°C (Customized up to -40°C) | | | |
| Shock Test | | 500m/sec ² , last11ms | | | |
| Vibration | | 5Hz-2000Hz , 3G rms | | | |
| IP | | IP 67 | | | |
| Dimension (D-H) | | 120*110mm | | 102*78mm | |
| Weight | | 1600g | | 1000g | |

2.3 System Composition

Lidar Sensors - Demo:



LSLIDAR

2.3 System Composition



Smart Zebra indicator.



| Name | Specification |
|---|---|
| Single Lamp | Dimensions L*W*H: 400* 200*30mm, with 3 light bars |
| The overall module of the lamp | Dimensions L*W*H: 400* 400*100mm, with 6 light bars |
| Weight | ~12kg |
| Material | Material Ductile iron, flame retardant material, LED |
| Protection level | anti-corrosion, wear-resistant, waterproof |
| Working voltage | 90-264VAC;43~67Hz |
| Communication module | GPRS\NB-IOT |
| Data transmission protocol | TCP/ <u>UDP</u> , FTP, PPP, <u>HTTP</u> and other data transmission protocols |
| Signal light output | supports multiple independent control outputs |
| Flashing time interval | 250MS |
| The power consumption of a single ground lamp | less than 36W in constant light mode, less than 12W in round flash mode |

2.3 System Composition

Smart Zebra indicator.

Smart Zebra

Options

- 3 working Modes



跑马模式

Monkey mode



跳闪模式

Bounce



常亮模式

Normally on mode

- 4 colours options



General Features

Resistance to friction, heavy pressure, water, corrosion, and no light pollution





3

Application Examples



Changsha, Southern China



Nanchang, Central China



Xining, Western China



World's Leading LiDAR Supplier

Contact: +86 139 2033 2675

Email: sales@leishenlidar.com

Website: www.leishenlidar.com