Serious traffic vehicle-to-pedestrian accidents increase over the world (each year, more than 270,000 pedestrians lose their lives on the world’s roads).

Research and development efforts in Advanced Driver Assistance Systems (ADAS) seek to save lives and reduce the number of on-road fatalities.

Computer vision techniques for pedestrian detection and tracking have progressed considerably and become widely used in several applications.

The literature review shows little use of these techniques in Advanced Driver Assistance Systems.

The likely reasons are the technical complexities that surround the processing of pedestrian videos.

### Scientific Challenges

- Pedestrians killed by age class - year 2011

### Objectives

1. Implementation of an automatically tool for pedestrian behavior analysis when crossing the street
2. Pedestrian data collection during the three phases of crossing the street (Approachment, Waiting and Crossing) through computer vision methods
3. Traffic data collection through computer vision methods
4. Merging pedestrian and traffic data to understand pedestrian and environment interaction and effect in road accident fatality.

### Results

- Proposed architecture of data extraction and correlation system

### Conclusion

- Road fatalities increased exponentially
- A literature review recently uses computer vision in ADAS
- An automatic tool for pedestrian behavior analysis based on computer vision methods
- Pedestrian behavior is very correlated by traffic and environment data

### Prospects

- Make a real-time behavior analysis system
- Incorporate computer vision tools into findings and understanding the crosswalk behavior base on multi-camera system.
- Detect the shortcoming of the urban amenities
- Improvement of this model for accident prediction

### Related Work

- Approaches are interested only to:
  - Pedestrians
  - Cars Traffic
  - Drivers
- We correlate the pedestrian/environment variables
- Manual or semi-automatic approaches:
  - Statistical analysis
  - Laser scanners
  - Crossing simulators
- We propose an automatic tool based on image processing
- No interventions for age estimation:
  - Pedestrians’ age are add manual or neglected
  - We propose to estimate age by image processing

### Proposed system

- Cameras 1 et 2: traffic
- Cameras 3: pedestrians

- Strategic Part:
  - Pedestrian speed
  - Cars speed
  - Distance pedestrian/car
  - Pedestrian trajectory
  - Car trajectory
  - Age

- Operational part:
  - Waiting behavior
  - Waiting time
  - Alone or in groups
  - Leader or Follower
  - Doing with gaps

- Data correlation:
  - Pedestrian speed
  - Waiting time
  - Pedestrian/car distance
  - Car speed
  - Car direction
  - Age
  - Traffic data
  - Accident prediction
  - Security gaps
  - Pedestrian age
  - Pedestrian behavior analysis system
  - Manual or semi-automatic approaches
  - Statistical analysis
  - Laser scanners
  - Crossing simulators
  - We propose an automatic tool based on image processing
  - No interventions for age estimation:
    - Pedestrians’ age are add manual or neglected
    - We propose to estimate age by image processing

- Old pedestrians behavioral study when crossing the street from automated image processing

- Proposed architecture of data extraction and correlation system