

• 做研究要有 動機

• Trajectory / Intention Prediction



<https://www.atssa.com/Blog-News/ATSSA-Blog/atssa-issues-recommendations-for-a-vulnerable-road-users-program>

自動緊急煞車系統

(Automatic Emergency Braking)

AEB是什麼？AEB全稱Autonomous Emergency Braking**主動煞停系統**，主要透過感測器（雷達、鏡頭等）偵測前方目標，透過控制器計算危險程度，當駕駛分心時，造成與前車過近，系統藉由聲響或燈號提醒，甚至主動介入達成煞停目的。

<https://c.8891.com.tw/feature/1082>

- 多數的交通意外來自車輛駕駛的人為疏失。
- 開發提升安全的**輔助系統**
- **緊急煞車系統**(AEB)的功能，可在車輛即將發生碰撞前，自動煞車以減緩車輛的損傷以及乘員的傷害。

<https://www.artc.org.tw/tw/knowledge/articles/13706>

主動安全配備是許多人買車所在意的重點，其中包含了一項重要的功能，那就是AEB (Automatic Emergency Braking) 自動緊急煞車輔助系統，有了這套系統將可以防止許多碰撞的事故發生，不論是車對車的追撞事故，又或者是車對人的撞擊預防，都有著極大的幫助，不過現在AAA美國汽車協會的調查發現，許多車款的AEB竟然沒有太多用處，基本上這套系統**只有在車輛速度較慢的情況下**可以正常運作，而高速行駛的狀況又或者是十字路口情形，AEB通常都不會有太多用處。

<https://cars.tvbs.com.tw/car-news/79144>

根據每家車廠的設計不同，每輛車的AEB作用原理也不盡相同，通常是透過**雷達**、**攝影機**、**光達**，這三者其中之一來判別有可能發生碰撞的情形，並且在偵測到即將發生碰撞事故時自動踩下煞車

AAA

- **時速48公里**的測試下，AEB從20次的測試當中防止了17次追撞。
- 當速度提高到**時速64公里**，20次的測試只有6次被成功預防。

30 km/h ↓

<https://cars.tvbs.com.tw/car-news/79144>

IIHS「夜間AEB自動緊急煞車輔助」測試 23輛車僅4輛獲高分



<https://speed.ettoday.net/news/2328593>

2023 Nissan Rogue - Automatic Emergency Braking (AEB) with Pedestrian Detection



• <https://www.youtube.com/watch?v=RkujJI4SBec>

Peeking into the Future: Pedestrian Trajectory Prediction in Video

视频中的行人轨迹预测

梁俊卫 / Junwei Liang

junweil@cs.cmu.edu

CMU Informedia

Advisor: Alexander Hauptmann



Carnegie Mellon University
Language Technologies Institute

<https://www.youtube.com/watch?v=XTzuzUeiDD4>



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CIPF: Crossing Intention Prediction Network based on Feature Fusion Modules for Improving Pedestrian Safety

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Abstract

As the development of autonomous driving technology continues, pedestrian safety is becoming an increasingly important issue. The ability of an autonomous car to accurately predict whether a pedestrian will cross the road is essential for ensuring their safety, as the vehicle can slow down in time or stop to avoid any potential accidents. However, predicting pedestrian behavior is a complex task influenced by various environmental and contextual factors. To deal with this issue, we propose a novel method, Crossing Intention Prediction based on feature Fusion modules (CIPF) that combines eight different input features extracted from both pedestrians and vehicles through three fusion modules using RNN layers and attention mechanisms. We demonstrated state-of-the-art performance of prediction accuracy in the PIE dataset, which is the most widely used for pedestrian crossing intention prediction. We also demonstrated the superiority of the performance of our CIPF network through qualitative and quantitative analysis. In particular, we also performed ablation studies on the verification of the effectiveness of the eight input features, the validity of VGG encoders, and performance comparison of our CIPF over time by adjusting the prediction time.

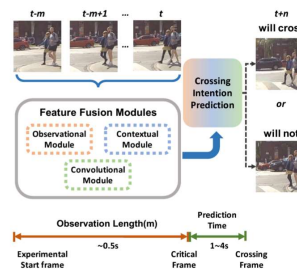


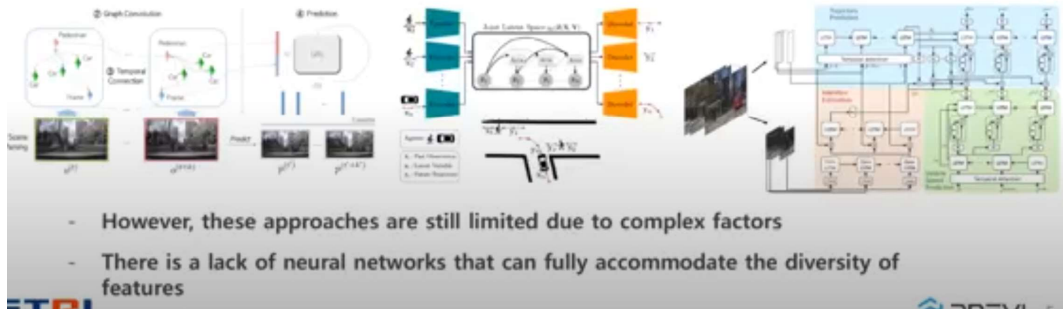
Figure 1. The concept of the pedestrian crossing intention prediction. Our proposed model, CIPF, which takes input features observed from m frames before to the current time t and passes them through three fusion modules - the observational, contextual, and convolutional modules - to extract the prediction results of whether the pedestrian will cross or not cross at future time $t+n$. For prediction, we define three frames: experimental start, critical, and crossing frames.

I . Introduction

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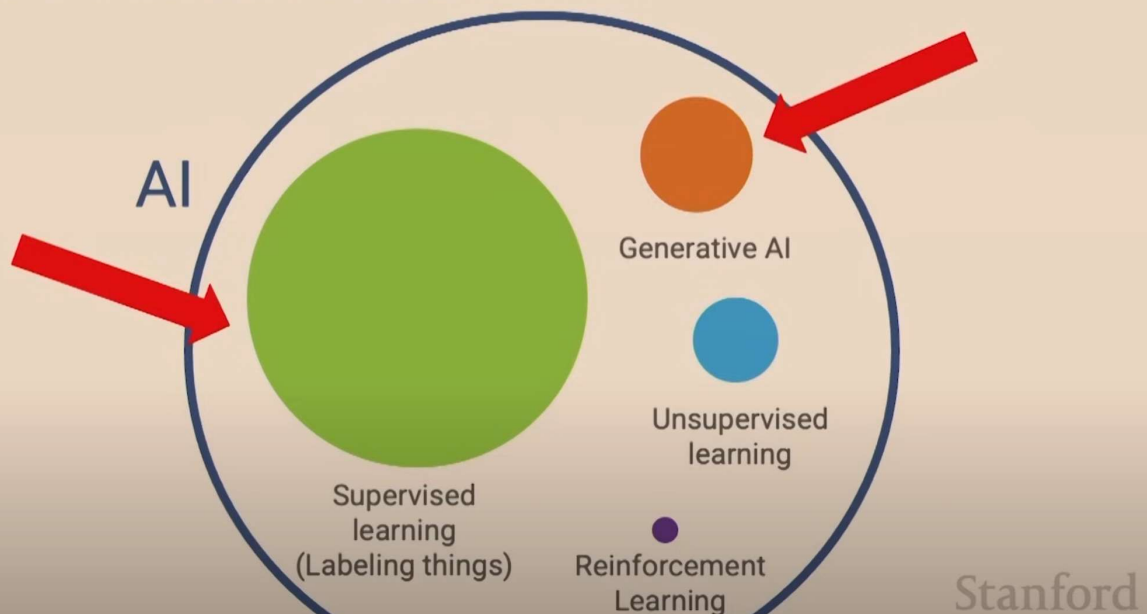
Some datasets for predicting pedestrian behavior

- STIP(Standard-TRI Intent Prediction): graph convolution (*IEEE RA-L & ICRA '20*)
- Euro-PVI(Pedestrian Vehicle Interactions in Dense Urban Centers) (*CVPR'21*)
- TITAN(Trajectory Inference using Targeted Action prior Network) (*CVPR'20*)
- PIE(Pedestrian Intention Estimation): the most widely used (*ICCV'19*)



<https://drive.google.com/file/d/19M3MVesdoOCFW2wv4ExHYKcNP3dMAMVa/view>

AI is a collection of tools



<https://www.youtube.com/watch?v=5p248yoa3oE&t=263s>



<https://www.youtube.com/watch?v=0fZGr93Ni1s>