

基於影像識別定位技術之火災逃生引示系統

Fire Escape Guidance System based on Image Recognition Positioning Technology

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摘要

都市人口快速增加下，城市大樓也一併的增加，即使在消防設備完備下的大樓，人們因缺少火災發生時的逃生知識、缺乏避難訓練、火災的逃生引導不明而引發災難的發生，當災害發生時，假如因驚慌失措而所困時間越長，安全逃脫的黃金時間越小。因此降低災害損失的關鍵因素，是如何在第一時間點判別出最佳的逃生路線以避免驚慌失措。依據內政部消防署 2021 年 1 至 7 月火災發生次數、火災起火原因和火災的損失統計，發生火災次數高達 1 萬 5,075 件，其中財物損失達 198,443 千元，多數民眾是在發生火災時困在大火之中而死亡，絕大多數原因是在火警時受困的安全逃生時間沒能快速做出反應並且準確的判斷，或沒有精確的指引路線而太過徬徨失措而失去寶貴的生命。本論文主要是研究火災發生時如何經由本系統輔助導引逃生。尤其在公共場所輔助民眾朝可行的方向疏散，本文運用影像識別定位技術加強指引火災發生時對各項逃生方向的指引，以期能在最短的時間發揮疏散和引導的功能，依據實驗本系統可提供在火災中避難逃生的建築物平面圖與逃生方向，能達到疏散群眾的效果，未來並可以結合無人載具，如無人機引導更可以加速逃生的指引。

關鍵詞：逃生、火災、影像辨識室內定位、逃生環境的指引

Abstract

With the rapid increase in the urban population, the number of urban buildings has also increased. Even in buildings with complete firefighting equipment, people lack knowledge of escape when a fire occurs, lack of evacuation training, and unclear fire escape guidance, which leads to disasters. When it happens, if you are trapped for a longer period of time due to panic, the better the prime time for safe escape is smaller. Therefore, the key factor in reducing disaster losses is how to identify the best escape route at the first point in time to avoid panic. According to statistics on the number of fires, causes and fire losses of the Fire Department of the Ministry of the Interior from January to July 2021, there were 15,075 fires in Taiwan, including 198,443,000 yuan of property losses. Most people were trapped in the

fire when the fire broke out. The vast majority of deaths are due to the failure to respond quickly and make accurate judgments during the safe escape time trapped during the fire alarm, or to lose precious lives because of lack of precise guidance and too much hesitation. This paper is mainly to study how to guide escape through this system when a fire occurs. Especially in public places to assist people to evacuate in a feasible direction, this article uses image recognition and positioning technology to strengthen the guidance of various escape directions when a fire occurs, so as to be able to perform the evacuation and guidance functions in the shortest time. According to the experiment, this system can provide The floor plan and direction of the building for evacuation in the fire can achieve the effect of evacuating the masses. In the future, it can also be combined with unmanned vehicles, such as drone guidance, which can speed up escape guidance.

Keywords: Guidance for Escape, Fire, Image Recognition Positioning, Guidance on Escape Environment