

# 基於深度學習之人臉辨識點名系統

## A face recognition roll call system based on deep learning

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### 摘要

近年來人臉辨識的應用越來越多，無論是利用人臉辨識技術來確認身分或是簡化人力，都能為生活帶來無數的便利。本次研究透過 Webcam 的即時影像拍攝，使用 Viola-Jones 人臉偵測法和膚色偵測等理論，使得抓取人臉時能更加準確。我們將大量收集的影像做初步的前處理，再利用 MATLAB 中卷積式類神經網路(Convolutional Neural Networks, CNN)模型架構來提取臉部的影像特徵作為辨識基礎，提取特徵最後再經由支援向量機(Support Vector Machine, SVM)學習進行分類。研究的最後以上課點名的方式來測試我們的人臉資料並藉由 GUI 介面達成使用上的方便性。

關鍵字：Viola-Jones 人臉偵測法、膚色偵測、卷積式類神經網路(Convolutional Neural Networks, CNN)、GUI 介面。

### Abstract

In recent years, the application of face recognition has been widely used. Face recognition can bring countless conveniences to our life, like using it to confirm identity or simplify manual work. This research used the webcam to capture instant image. We apply some theories like Viola-Jones detection method and skin color detection to achieve more accuracy and reduce the rate of error when grabbing face. We use a large number of collected images for preliminary pre-processing and then use the convolutional neural network (CNN) model architecture in MATLAB to extract the face in the image. Image features are used as the basis for identification, and features are extracted and finally classified by Support Vector Machine (SVM). Finally, we use our model to establish a roll call system. From this system we can test our face data. To achieve the convenience for uses we implement our system on a GUI interface.

Keywords: Viola-Jones detection method, skin color detection, Convolutional Neural Networks (CNNs), GUI interface.