DEEP LEARNING FOR FACE RECOGNITION IN SURVEILLANCE VIDEOS

by

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Master of Engineering in Computer Science

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Acknowledgments

Abstract

Abstract here..

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Chapter 1

Introduction

Some text.

1.1 Overview

Human monitoring is therefore becoming increasingly expensive and ineffective as the torrent of video data increases. For instance, in a CCTV monitoring room (see Figure **??**), security operators are required to monitor 24 hours a day and be ready to take action when an alarm occurs.

1.2 Problem Statement

Some text ...

1.3 Objectives

Some text ...

1.4 Limitations and Scope

Some text ...

1.5 Thesis Outline

I organize the rest of this dissertation as follows.

In Chapter **??**, I describe the literature review.

In Chapter **??**, I propose my methodology.

In Chapter **??**, I present the experimental results.

Figure 1.1: CCTV monitoring room. Reprinted from the Twenty First Security Web site (`http://www.twentyfirstsecurity.com.au/`).

Finally, in Chapter **??**, I conclude my thesis.

Chapter 2

Literature Review

Some intro..

2.1 Section Name in Literature Review

Example text below ..

? (?) apply the background subtraction technique to extract blobs or human from a scene by the following conditions:

$$\begin{array}{ll} \text{if} & |I_a(x,y) - I_b(x,y)| < T,\ I_e(x,y) = 0 \\ \text{else} & I_e(x,y) = I_a(x,y), \end{array}$$

where $I_e(x,y)$ is a human extracted image, $I_a(x,y)$ is an original image, $I_b(x,y)$ is a background image, and T is a threshold. Figure **??** shows something. Some work also uses mesh features (?,?).

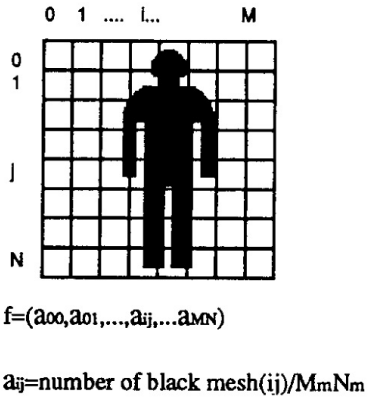

Figure 2.1: Mesh feature calculation. Reprinted from the work of Yamato et al. (1992).

Chapter 3

Methodology

Some intro..

3.1 System Overview

Some text .. Algorithm **??** is just a pseudocode.

3.2 System Design

3.2.1 Design A

Some text ..

Algorithm 1 Lame Algorithm

Input: B: set of all current blobs

Input: T: set of all current tracks

Input: M: merged track association matrix

Output: $\widetilde{T}$: set of all revised tracks

Output: $\widetilde{M}$: revised merged track association matrix

$\widetilde{T} \leftarrow \emptyset$; $\widetilde{M} \leftarrow \emptyset$; $L \leftarrow \emptyset$

$A \leftarrow$ GET-OVERLAP-AREA-MATRIX(B, T)

for each $t \in T$ **do**

if t is marked as processed **then** continue

$B' \leftarrow \{b' \mid A(b', t) > 0\}$ {B' contains candidate blobs for track t.}

$T' \leftarrow \{t\} \cup \{t' \mid M(t, t') = 1\}$ {T' contains all tracks currently merged with t.}

if $|B'| \geq 1$ **then**

for each $t' \in T'$ **do**

Let $b = \underset{b' \in B'}{\operatorname{argmax}} S(b', t')$

$L \leftarrow L \cup \{(t', b)\}$

MARK-TRACK-AS-PROCESSED(t')

end for

end if

end for

for each $(t_i, t_j) \in T \times T$ **do**

If $\exists b$ s.t. $(t_i, b) \in L \wedge (t_j, b) \in L$, $\widetilde{M}_{ij} \leftarrow 1$, otherwise $\widetilde{M}_{ij} \leftarrow 0$

end for

$T^* \leftarrow \{t^* \mid \neg\exists b \in B$ s.t. $(t^*, b) \in L\}$ {T^* contains tracks for which "stale count" will be increased.}

$\widetilde{T} \leftarrow$ UPDATE-OR-DELETE-STALE-TRACKS(T, T^*)

$B^* \leftarrow \{b^* \mid \neg\exists t \in T$ s.t. $(t, b^*) \in L\}$ {B^* contains blobs with no tracks assigned.}

$\widetilde{T} \leftarrow$ ADD-NEW-TRACKS-FOR-NOT-LINKED-BLOBS$(\widetilde{T}, B^*)$