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(71) Applicant (for all designated States except US):
**NANYANG TECHNOLOGICAL UNIVERSITY,
CENTRE FOR SIGNAL PROCESSING** [SG/SG]; c/o
Innovation and Technology Transfer Office, Blk 1, Unit
213, 16 Nanyang Drive, Singapore 637722 (SG).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **YAU, Wei, Yun**
[MY/SG]; Nanyang Technological University, Centre
for Signa, 1 Processing, c/o Innovation and Technology

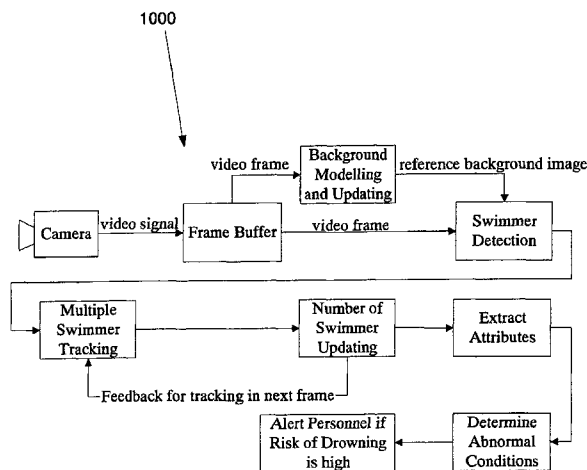
Transfer Office, Blk 1, Unit 213, 16 Nanyang Drive, Sin-
gapore 637722 (SG). **LU, Wen Miao** [CN/SG]; Nanyang
Technological University, Centre for Signa, 1 Processing,
c/o Innovation and Technology Transfer Office, Blk 1,
Unit 213, 16 Nanyang Drive, Singapore 637722 (SG).
KAM, Siew, Wah, Alvin, Harvey [MY/SG]; Nanyang
Technological University, Centre for Signa, 1 Processing,
c/o Innovation and Technology Transfer Office, Blk 1,
Unit 213, 16 Nanyang Drive, Singapore 637722 (SG).
TAN, Yap Peng [MY/SG]; Nanyang Technological Uni-
versity, Centre for Signa, 1 Processing, c/o Innovation and
Technology Transfer Office, Blk 1, Unit 213, 16 Nanyang
Drive, Singapore 637722 (SG).

(74) Agents: **HAQ, Murgiana** et al.; Haq & Selvam, 80 Raffles
Place, UOB Plaza 1, #42-02, Singapore 048624 (SG).

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(54) Title: DROWNING EARLY WARNING SYSTEM



(57) Abstract: This invention describes an audio-visual based method and system for early drowning detection system. In this invention, a number of cameras (100, 200, 201) are mounted on top of a swimming pool (101). These cameras (100, 200, 201) are used to monitor swimmers in the pool (101) together with the aid of an array of microphones (103). Similarly, the microphone array (103) is mounted above the water to cover the entire swimming pool (101). Based on the motion and activity of the swimmer detected through the video camera (100, 200, 201), the swimmer's condition is automatically analyzed. Such automated video analysis includes building the visual background model of the pool (101), detecting the presence of the swimmers in the monitored areas (106), estimating the number of swimmers inside the monitored area (106), tracking the swimmers and analyzing the behaviour of each tracked swimmer in terms of body orientation, moving direction and motion patterns. In addition, the microphone array (103) is deployed to pick up audio signals (104) originating from distress calls. Once the system detects the presence of a potential drowning, both visual and audio alarms will be activated to draw the attention of the person in charge for further confirmation and if necessary to provide necessary follow-up rescue actions.

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