ABSTRACT

Analysis of human motion is studied in the context of 2D video image estimation. An adaptive human motion estimation filter with integrated phase compensator is designed to extract the relevant features from the human motion information through video samples. The use of phase compensator ensures that the algorithm performs well for both low and high frequency human motion estimation. An extended principal component analysis is applied to the two dimensional situation for dimensional reduction and results obtained, prove to be superior, compared to reported schemes. A correlation extractor is emulated in the hardware and extracts the interframe pixel correlation values and is spatial dependent. The implemented algorithm is scalable and generic and cause least modifications on the representation coefficients. Thus, it can tolerate increased variations on the motion appearance and keep the basis representation vector unaffected. Implementation results with real sequences are evaluated. The artefacts considered in the design include:

(i) Effects of expression

(ii) Illumination and

(iii) Occlusion variations.
Promising application areas include diverse fields like robot vision, automobile industry, surveillance etc. The algorithms are implemented in real time on STM32F103xx ARM processor with MATLAB interface. The 2-D DCT core is implemented in the hardware and from the hardware implementation view; the research offers the advantage of reduced computational complexity without any trade off with the data independent nature.

**Key words:** Human motion estimation, 2-Dimensional feature extraction, Phase Compensator, Principal Component Analysis, Neural Network