International Journal of Engineering Sciences & Emerging Technologies, June 2014.
ISSN: 22316604 Volume 6, Issue 6, pp: 458-461 ©IJESET

# GRAY-LEVEL IMAGE REPRESENTATION OF MAPPING FUNCTION FOR DIRECT MODEL BASED CODING

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***ABSTRACT***

*Recursive Estimation 3D motion estimate through optical flow fields is also called interface motion estimation", since it only estimate the relative motion between two frames, to obtain absolute motion, a recursive motion estimation system was first used. In this system, the global motion can be given in the following way are the absolute motion at time instant and, respectively, the two-view motion. Although "regularization" term is applied in motion estimation, the motion parameters obtained from the two-view case are inherently noisy. Analysis-By-Synthesis In model based coding a powerful system is based on the analysis-by-synthesis principle.*

## I. INTRODUCTION

To avoid the dense correspondences requirement, subspace model of 2D face views was utilized. The idea is to set up a direct mapping function between the representation space and the pose parameter space [1-5] used principal components analysis to find the low-dimensional subspaces of facial pose, and used appearance based matching using Gabor wavelets for pose estimation. It is used support vector machine to classify head pose into three discrete pose by learning a direct mapping from 2D gray-level image representation to head poses [4]. It is proposed the framework to deal with the problem. Representations derived from training samples are first subjected to principal component analysis in order to generate a compact flexible parameterized linear model, then explicitly relate the model parameters and head pose variations by a linear mapping function which is also learned from the training samples. Methods used in Model Based Coding Here we give some more reviews of face motion estimation related to model based coding. In model based coding, parameters are time-dependent and we need to dynamically provide parameters after the initialization stage. This is so called successive estimation problem. The problem of passive navigation is discussed and it is very valuable for understanding the motion estimation problem [6]. Under perspective projection, the optical flow field is a nonlinear function of 3D motion and structure of object where the coordinates of the image plane are. It's not enough just to recover 3D motion parameters from its optical flow field through this equation, in the model based coding community, a smart way is proposed to solve this problem. That is to use 3D wireframe model data to replace the depth. After this replacement, the optical flow constraint equation above becomes a linear function of 3D motion parameters. Other simplified model like planar model, ellipsoid model also been tried to solve the problem. Three major groups of algorithm frameworks are used to handle the tracking problem.

## II. METHODS AND MATERIALS

It is widely used to extract dynamic parameters. There are three main modules in the ABS system. Image analysis, image synthesis and parameter prediction. It's a close loop feedback system to prevent the presence of accumulating error. It is using this scheme, also belongs to this group. Kalman Filter Based Method An alternative approach is to use filtering to track facial motion by recursively following a set of feature points which are supposed to be more robust to light variation. The Kalman filter allows the use of an explicit dynamic motion model, is the Kalman gain. Kalman filtering achieves an optimal combination of information from both motion model and online measurement. A motion tracking system based on Kalman filtering is illurstrate. It looks quite similar to ABS system. An initialization operation only happens in the beginning of tracking. Non real-time initialization operation is acceptable. After all we all are getting used to a slow starting with information tools. Think about how you start a computer. Although fast and simple initialization is preferred, the most important requirement is to have an automatic initialization process. High To achieve automatic tracking, we are ready to accept an initialization process with a high complexity. Since a tracking operation is divided into two separated stages: initialization and successive tracking, computation-intensive initialization operations can be moved to and done in either a dedicated server or networks where sufficient computational resources can be expected. This makes it possible to run model-based coding in a high-end mobile phone or a PDA. Using a Generic Face Model or personal Face Model Traditionally, generic face models were employed in model-based coding. To fit a generic face model to a specific face, both the global and local transforms have to be recovered. Diverse facial appearances and shapes make it extremely difficult to estimate the local transform. If a personal face model is employed, the computation of the local transform is avoided. This greatly reduces the difficulty of model fitting. This is why adopting a personal face model is getting popular in recent publications of model-based coding and model-based face tracking. The major problem with the usage of personal face model is when and how to deform a generic model into a personal one. How, When, and Where Human Aid in Fitting is Required, Today we have to accept a fact that automatic fitting is very hard and certain human intervention is inevitable. The key lies in when and how to apply human intelligence in the fitting process. Obviously, it is not acceptable to have a manual fitting in the beginning of automatic model coding operation. Human aid can only be done before real operation. Figure 1 structure of NN networks for model based functions. A critical question is how to make the manual work done offline useful in the real tracking operation. The role of an initialization process is to facilitate the following successive tracking process. The initialization process is needed once and is carried out in the beginning of tracking. Here an implicit assumption is made: the successive tracking module always works. In real-world applications, the tracking system might fail, where a re-initialization process is definitely needed to recover the system from the failure. This gives initialization the second role in a tracking process. The question is whether the same initialization module should be used in re-initialization.

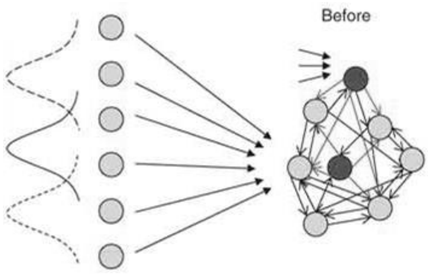


**Figure 1** structure of NN networks for model based functions

## III. RESULTS AND DISCUSSION

We adopt a new strategy to do automatic fitting. First we have to accept that fully automatic fitting is very hard and certain human intervention is inevitable. The key lies in when and how the necessary human intelligence is integrated into an automatic fitting system. Unlike conventional approaches, we distinguish application from initialization. Typical application stage consists of fitting and tracking. Depending on which type of fitting, automatic fitting or manual fitting, is integrated with automatic tracking, one normally divides tracking systems into automatic systems and semi-automatic systems. With the traditional thinking, one has to make a choice between automatic fitting and manual fitting for initialization. Here we suggest a new strategy to do initialization, Pseudo-automatic fitting, which includes both automatic fitting and manual fitting. Tracking Manual fitting, Auto fitting, Initialization Tracking, Offline work Application, Auto fitting, Manual fitting, Tracking Fully automatic, solution

Semi-automatic solution Pseudo-automatic, Solution Necessary human knowledge on fitting is manifested in manual fitting, which is done in offline work. In the real application stage, no human intervention is needed and only automatic fitting is adopted. Therefore, from application point of view, this is a fully automatic system. Since it is done offline, manual fitting can be done by user self or by third parties, which can solve the problem of demanding on technical skill of the user it shows the difference in the use of fitting in a face tracking system. The significant point with our pseudo-automatic solution is that an initialization is extended to include an offline stage also where manual fitting is carried out. The initialization problem is transferred into a new technical problem: how to synchronize manual fitting with automatic fitting. Initialization is performed in two stages: From the template image, a frontal-view face image of the user, numerous facial feature points are selected and localized. A generic 3D wireframe model is fitted to the face the fitting operation can be done manually by the user or by third parties. Figure 2 exhibits data realization image after training the data. After fitting the generic wireframe is deformed into a personal wireframe. Automatic Fitting: During the application process, the defined facial feature points are detected and localized from the face of the user appearing in the first frame of video. Change in spatial coordinates of the facial feature points can be modeled represent the same feature point appearing in the template image and the first frame. It refers to the global transform. Later on we will show that it is much simpler to compute. Now the initialization problem can be solved by using the personal wireframe created in the manual fitting stage and applying GF on the personal wireframe. More specifically, the local transform is fixed by manual fitting.

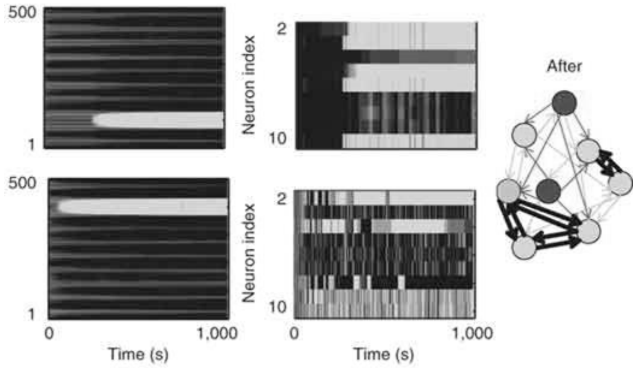


**Figure 2** data realization image after training the data

## IV. CONCLUSION

Face pose could be estimated with a set of 2D view templates, each of which is associated with a face pose. The input image is subjected to the nearest neighbor searching and the most similar template is estimated as the pose. It is used a coarse-to-fine template matching of image features to estimate the pose. In order to get better performance, dense correspondence between the templates and pose is required, it is used specialized data acquisition system to get densely sampled template, and they used template matching based on the magnitude of Gabor wavelet transform.

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