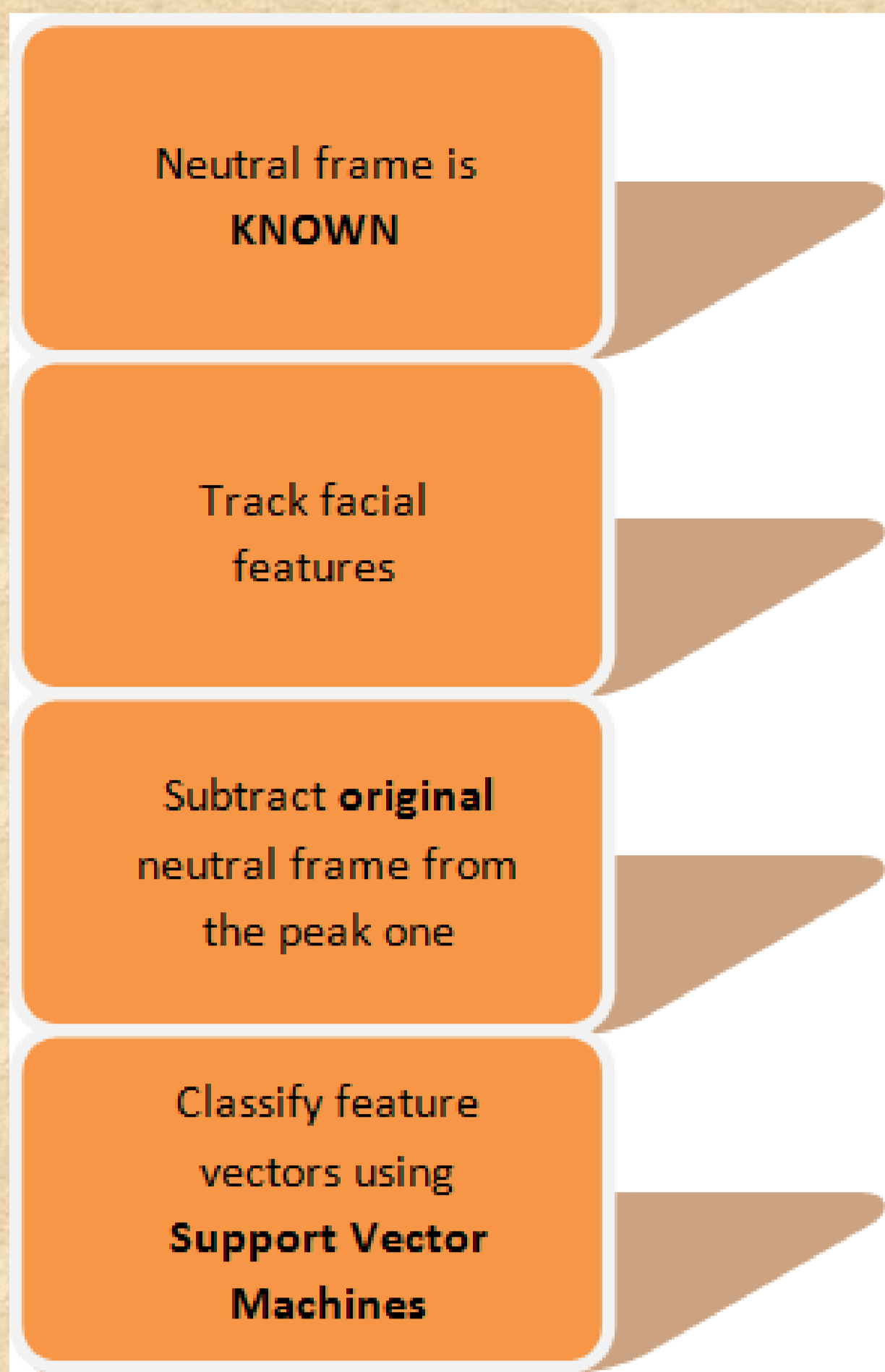


1 INTRODUCTION

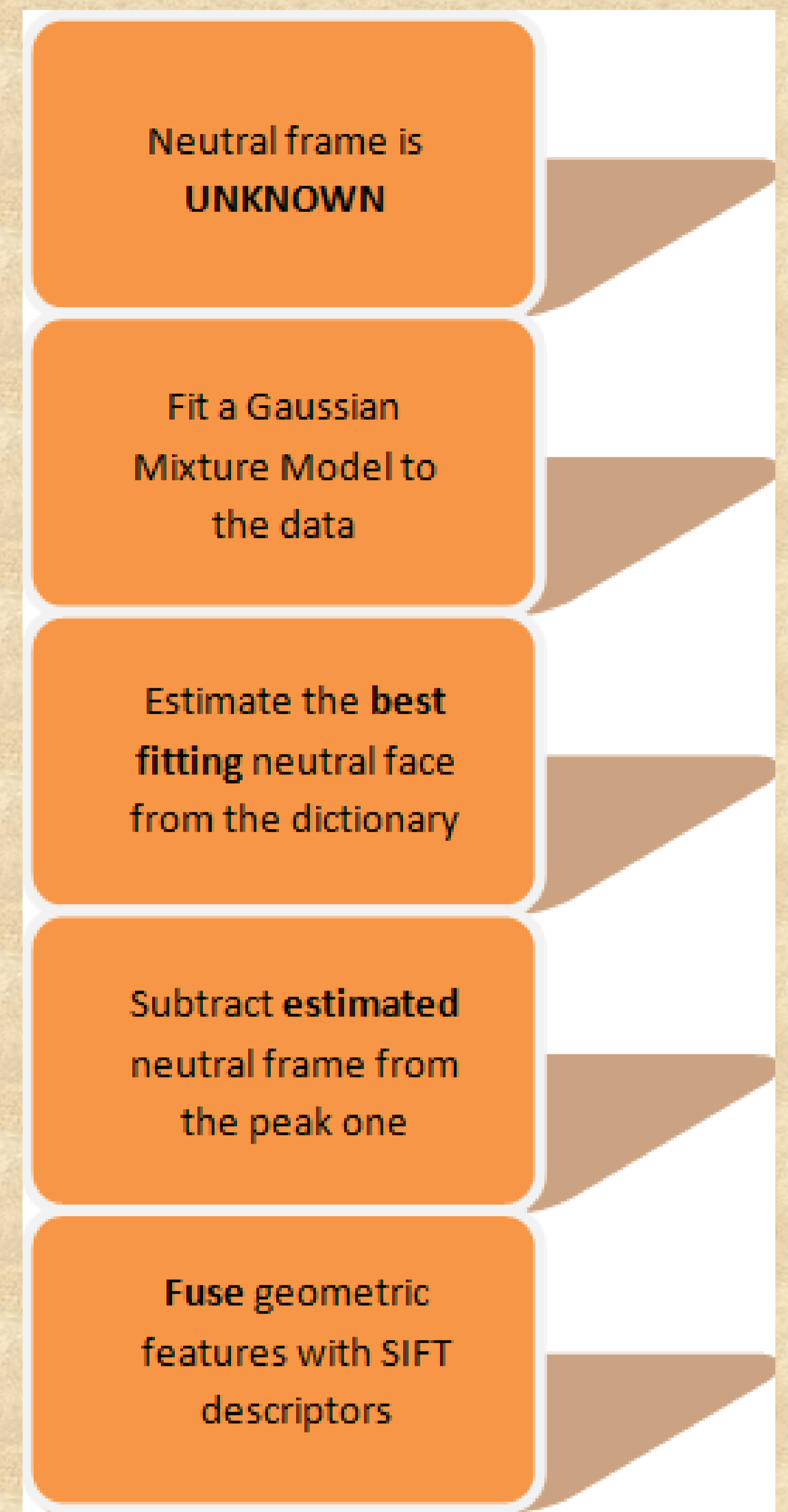
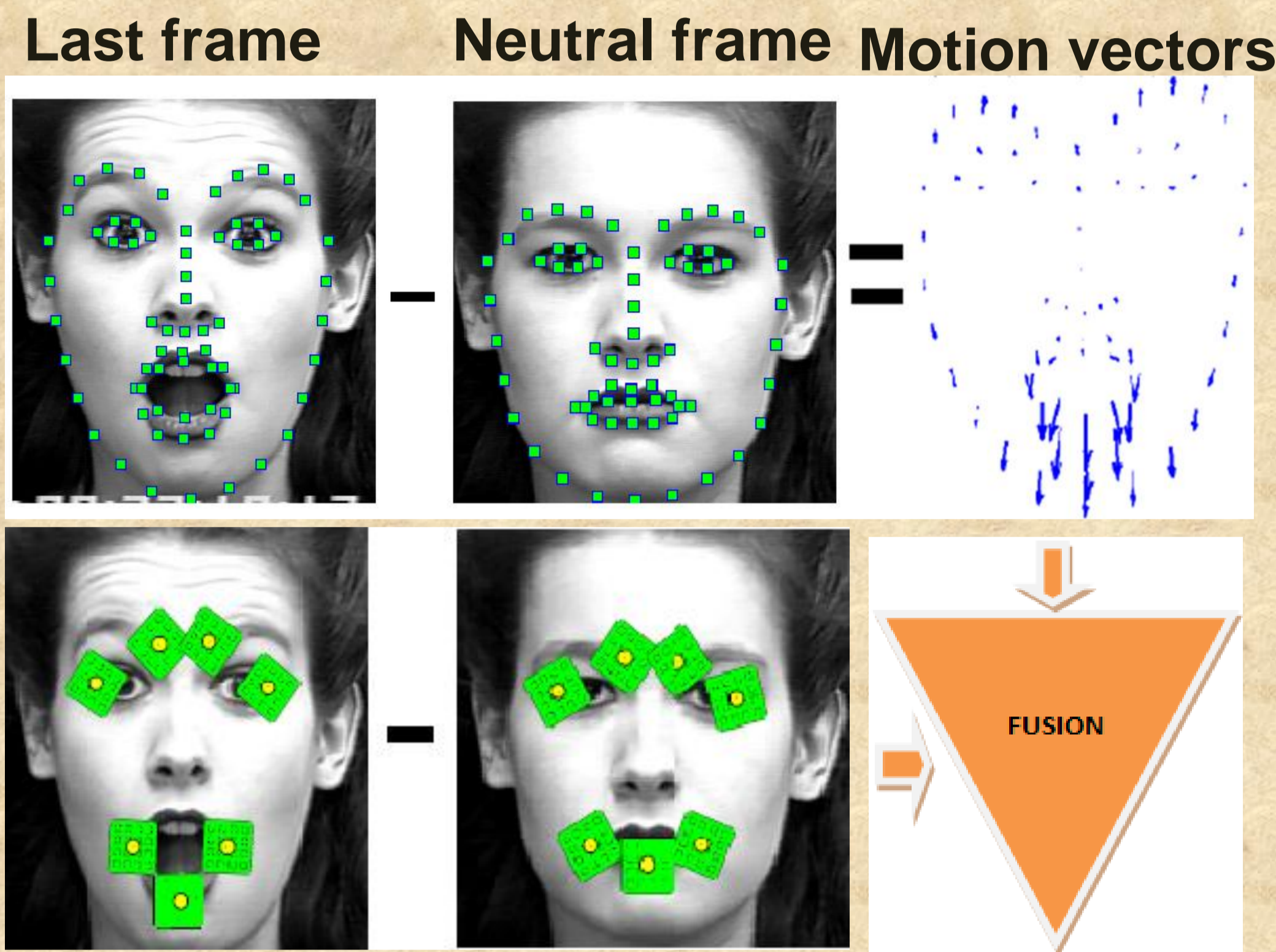
2

PROPOSED METHOD



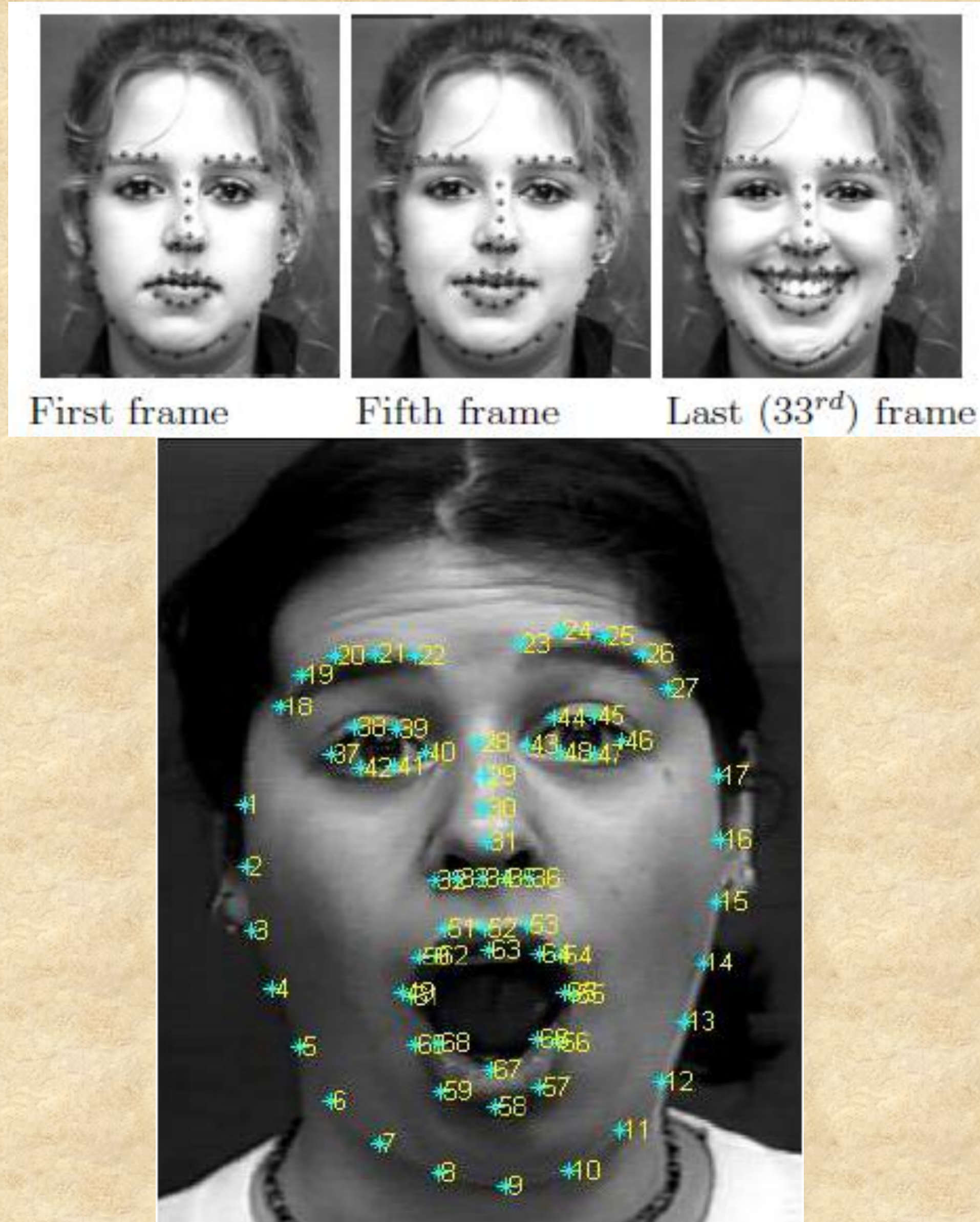
Facial Expression Recognition

- ❖ Neutral frame availability
- ❖ Geometrical features
- ❖ Appearance features
- ❖ 6 discrete emotion classes
- ❖ Extended Cohn-Kanade Database

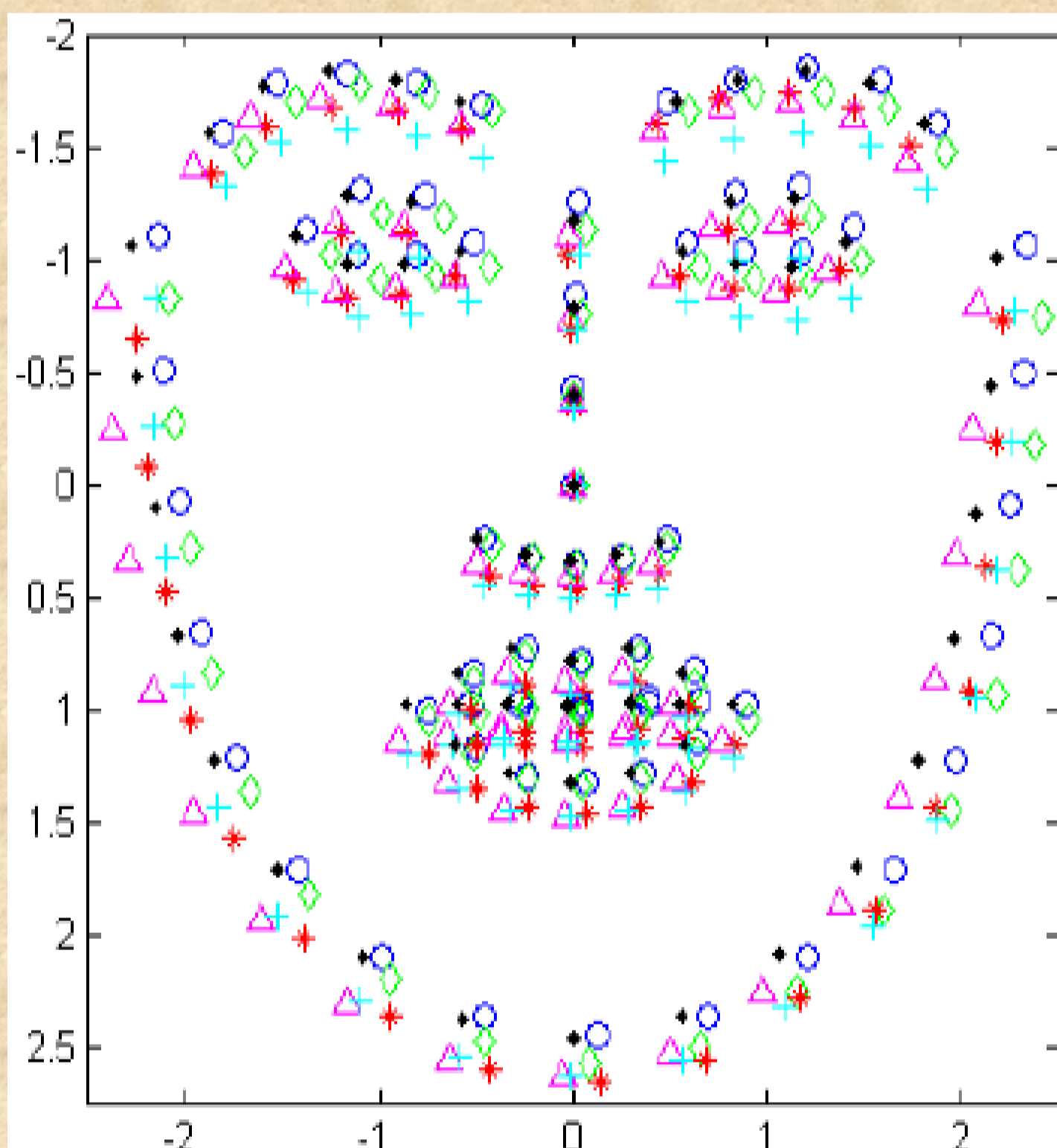


3 FITTING a GMM and FEATURE POINTS

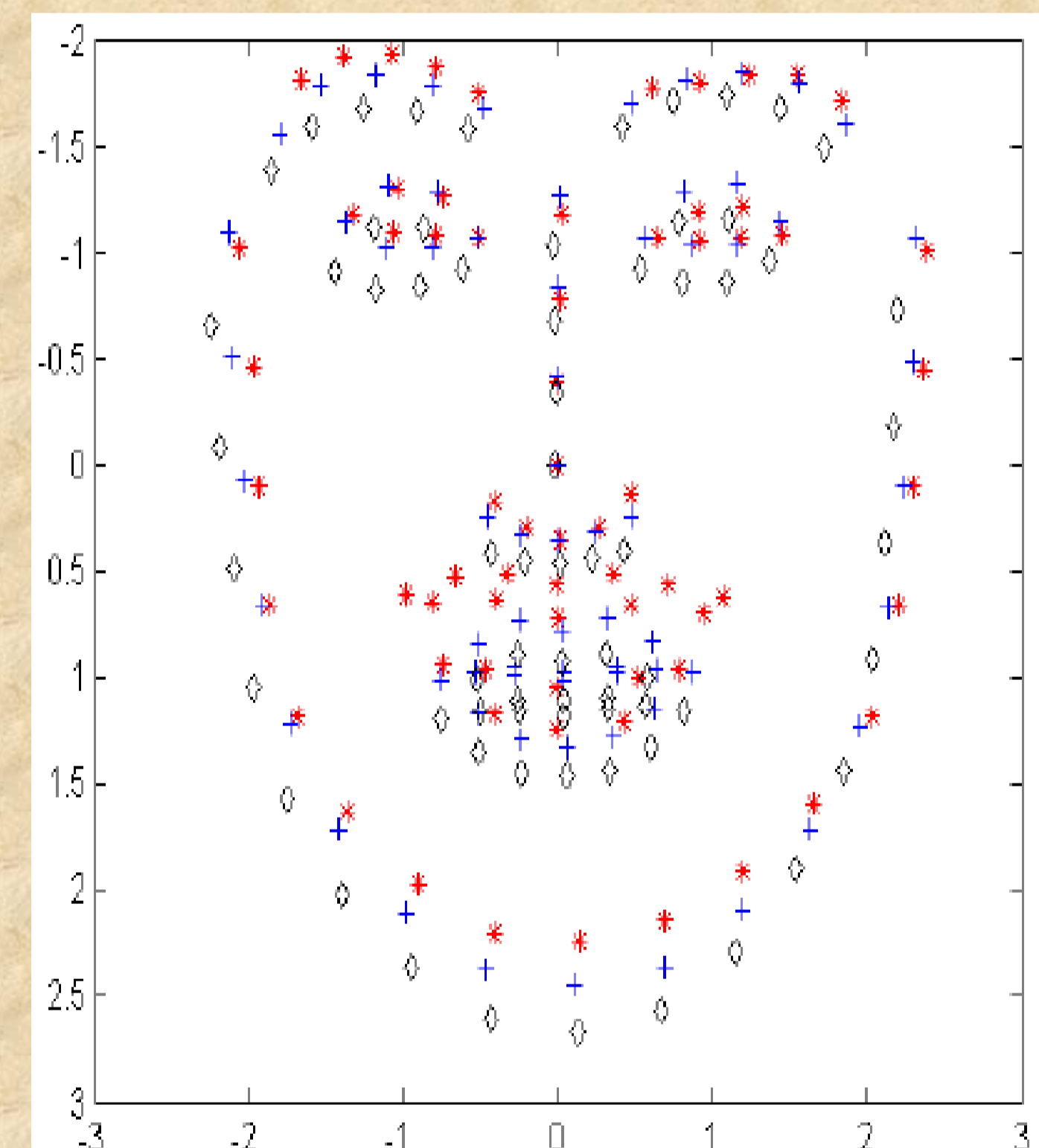
Tracking data based on Active Appearance Model (AAM) on Active



Neutral Face Shape Dictionary



Best fit vs. Worst fit



Magic points

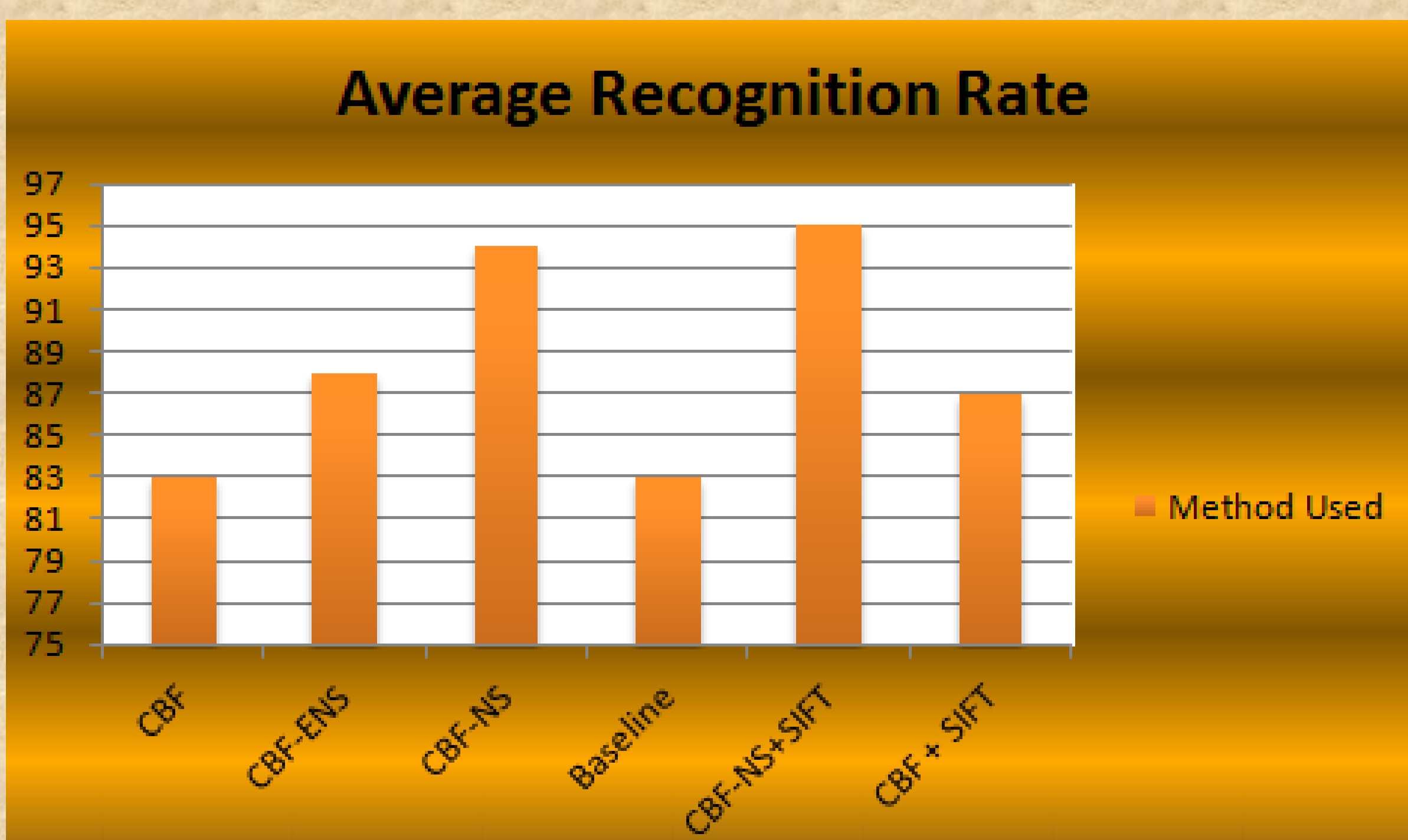
$$\{P_{n,i}^1, P_{n,i}^2, P_{n,i}^3, P_{n,i}^{15}, P_{n,i}^{16}, P_{n,i}^{17}, P_{n,i}^{40}, P_{n,i}^{43}\}$$

$$p(\mathbf{s}) = \sum_{k=1}^K p(\mathbf{s}|G_k)P(G_k)$$

$$p(\chi|\Phi) = \prod_{n=1}^N p(\mathbf{s}_n|\Phi) = \prod_{n=1}^N \left(\sum_{k=1}^K P(G_k)\mathcal{N}(\mathbf{s}_n|\mu_k, \Sigma_k) \right)$$

4 RESULTS and CONCLUSION

- ❖ When the person-specific face shape is not available, it is better to use proposed neutral face shape estimation method.
- ❖ The proposed method gives higher emotion recognition rates than the baseline method, although we do not use any person-specific neutral shapes and any appearance based features. If we use, recognition rate is 94%.



- ❖ It is better to use appearance and geometric features together.

This work has been supported by the Turkish Scientific and Technical Research Council under Project 110E056

Reference: Lucey, P., et al., *The Extended Cohn-Kanade Dataset (CK+): A complete dataset for action unit and emotion-specified expression*, in *Proceedings of IEEE workshop on CVPR4HCBA*, 2010.