4.5 Training with outside data

Finally, we present our best performance on LFW along with existing state of the art methods or systems. Our purposes are threefold: 1) verify the generalization ability from one dataset to another dataset; 2) see what we can achieve using a limited outside training data; 3) compare with other methods which also rely on the outside training data.

We follow the standard unconstricted protocol in LFW and simply combine the four similarity scores computed under LBP feature and three types of LE [25] features. As shown by ROC curves in Figure 6, our approach with simple joint Bayesian formulation is ranked as **No.1** and achieved **92.4**% accuracy. The error rate is reduced by over 10%, compared with the current best (commercial) system which takes the additional advantages of an accurate 3D normalization and billions of training samples.

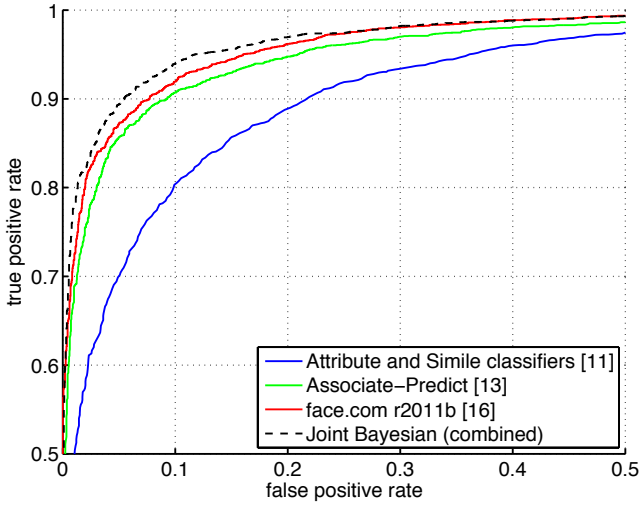

Fig. 6. The ROC curve of Joint Bayesian method comparing with the state of the art methods which also rely on the outside training data on LFW.

5 Conclusions

In this paper, we have revisited the classic Bayesian face recognition and proposed a joint formulation in the same probabilistic framework. The superior performance on comprehensive evaluations shows that the classic Bayesian face recognition is still highly competitive and shining, given modern low-level features and a training data with the moderate size.