**HAND GESTURE RECOGNITION SYSTEM**

**ABSTRACT**

Hand Gesture algorithms are key enabling technologies for Human-Computer Interaction (HCI) systems. State of the art approaches for automatic detection of body movements and for analyzing emotions from facial features heavily rely on advanced machine learning algorithms. Most of these methods are designed for the average user, but the assumption “one-size-fits-all” ignores diversity in cultural background, gender, ethnicity and personal behaviour and limits their applicability in real world scenarios. A possible solution is to build personalized interfaces, which practically implies learning person-specific classifiers and usually collecting a significant amount of labeled samples for each novel user. As data annotation is a tedious and time consuming process, in this paper we present a framework for personalizing classification models which does not require labeled target data. Personalization is achieved by devising a novel transfer learning approach. Specifically, we propose a regression framework which exploits auxiliary (source) annotated data to learn the relation between person-specific sample distributions and the parameters of the corresponding classifiers. Then, when considering a new target user, the classification model is computed by simply feeding the associated (unlabeled) sample distribution into the learned regression function. We evaluate the proposed approach in different databases demonstrating the generality of our method with respect to different input data types and basic classifiers. We also show the advantages of our approach in terms of accuracy and computational time both with respect to user-independent approaches and to previous personalization techniques.