

## Recognizing an Individual, Their Topic of Conversation and Cultural Background from 3D Body Movement

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**Abstract :** The 3D body movement signals captured during human-human conversation include clues not only to the content of people's communication but also to their culture and personality. This paper is concerned with automatic extraction of this information from body movement signals. For the purpose of this research, we collected a novel corpus from 27 subjects, arranged them into groups according to their culture. We arranged each group into pairs and each pair communicated with each other about different topics. A state-of-art recognition system is applied to the problems of person, culture, and topic recognition. We borrowed modeling, classification, and normalization techniques from speech recognition. We used Gaussian Mixture Modeling (GMM) as the main technique for building our three systems, obtaining 77.78%, 55.47%, and 39.06% from the person, culture, and topic recognition systems respectively. In addition, we combined the above GMM systems with Support Vector Machines (SVM) to obtain 85.42%, 62.50%, and 40.63% accuracy for person, culture, and topic recognition respectively. Although direct comparison among these three recognition systems is difficult, it seems that our person recognition system performs best for both GMM and GMM-SVM, suggesting that inter-subject differences (i.e. subject's personality traits) are a major source of variation. When removing these traits from culture and topic recognition systems using the Nuisance Attribute Projection (NAP) and the Intersession Variability Compensation (ISVC) techniques, we obtained 73.44% and 46.09% accuracy from culture and topic recognition systems respectively.

**Keywords :** person recognition, topic recognition, culture recognition, 3D body movement signals, variability compensation

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