ADAPTATION TO NEW USER INTERACTIVELY USING DYNAMICALLY CALCULATED PRINCIPAL COMPONENTS FOR USER-SPECIFIC HUMAN-ROBOT INTERACTION

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Abstract

This paper presents an algorithm for interactive adaptation to new user using dynamically calculated principal components. In this algorithm, new user is adapted based on the matching score of face recognition method that use dynamically calculated eigenvectors and eigenvalues from known training face dataset. User adaptation method measures the trueness of known and unknown person using the recognition result from specific number of consecutive face images. If the value of trueness for unknown person is greater than specific threshold then the robot informs the person is unknown and asks the person name and culture information to preserve in the knowledge-base through interaction. In case of known person the system greets with that person based on his/her predefined culture. The system increments the training face dataset by including any unknown face image and subsequently recalculates the eigenvectors and eigenvalues to form new PCA. The algorithm is tested by implementing a human-robot greeting scenario with a mobile robot.