**Christ (Deemed to be University), Bengaluru.**

**MAI272 - Advanced Machine Learning**

**Lab Exercise 4**

**Department of Computer Science**

P4. Using a dataset from your chosen domain (e.g., a labeled dataset of facial images for facial recognition):

1. Apply PCA to extract the principal components and reduce the dataset’s dimensionality while retaining as much variance as possible.
2. Apply LDA to project the data onto a lower-dimensional space, using the labels to maximize class separability.
3. Apply ICA to identify statistically independent features that can represent key information in the images.

Once the data has been transformed by each method, train a classifier (such as k-Nearest Neighbors or SVM) on each reduced dataset. Finally, compare and analyze the classification accuracy for each technique to determine which approach best preserves the distinguishing features in your chosen domain.

**Evaluation Rubrics:**

Correctness and Clarity – 3 marks. Complexity and Validation – 3 marks.

Code & Concept Knowledge and Viva Voice – 2+2 marks.

**Submission Guidelines:**

* Generate the single .pdf file for the given questions separately. File name should be your register number followed by the program number. (Eg. 2447235\_4)
* Upload the pdf files in Google Classroom on or before the deadline mentioned.