Steps:

Given – source domain data (S), and target domain data (T)

Extract d-dimensional features for data from both S and T.

1. Perform PCA on S and T (separately). Choose the top N eigenvectors (N is a tunable parameter, and has to be the same for both S and T)
2. Compute geodesic between the PCA subspaces obtained from source and target. Use “compute\_velocity\_grassmann\_efficient.m”
3. Sample points along the geodesic using “compute\_Y\_havingVelocity.m”. Obtain intermediate subspaces (matrices of size d-by-N)
4. Project the source and target data on to all these subspaces (the intermediate ones, as well as the source and target subspaces).
5. Concatenate the projections of each data into a long vector.
6. Learn a discriminative classifier on the labeled source data projections using PLS. Use “learnPLS\_cpu.m”. The PLS dimensions “numFactor (in the m-file)” is a tunable parameter.
7. Project the source data projections, and unlabelled target data projections on the PLS space, using “projectPLS\_cpu.m”, and then perform classification using 1-NN method.

For multi-domain adaptation – after step 1, use the Karcher mean “compute\_grassmann\_mean.m” to obtain the “mean” subspaces for S and T, and then follow the remaining steps between these “mean subspaces”.