Variational Bayes Principal Components Analysis

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Import package Rdimtools, an R suite of a number of dimension reduction and estimation methods.

Generate helix-shaped data

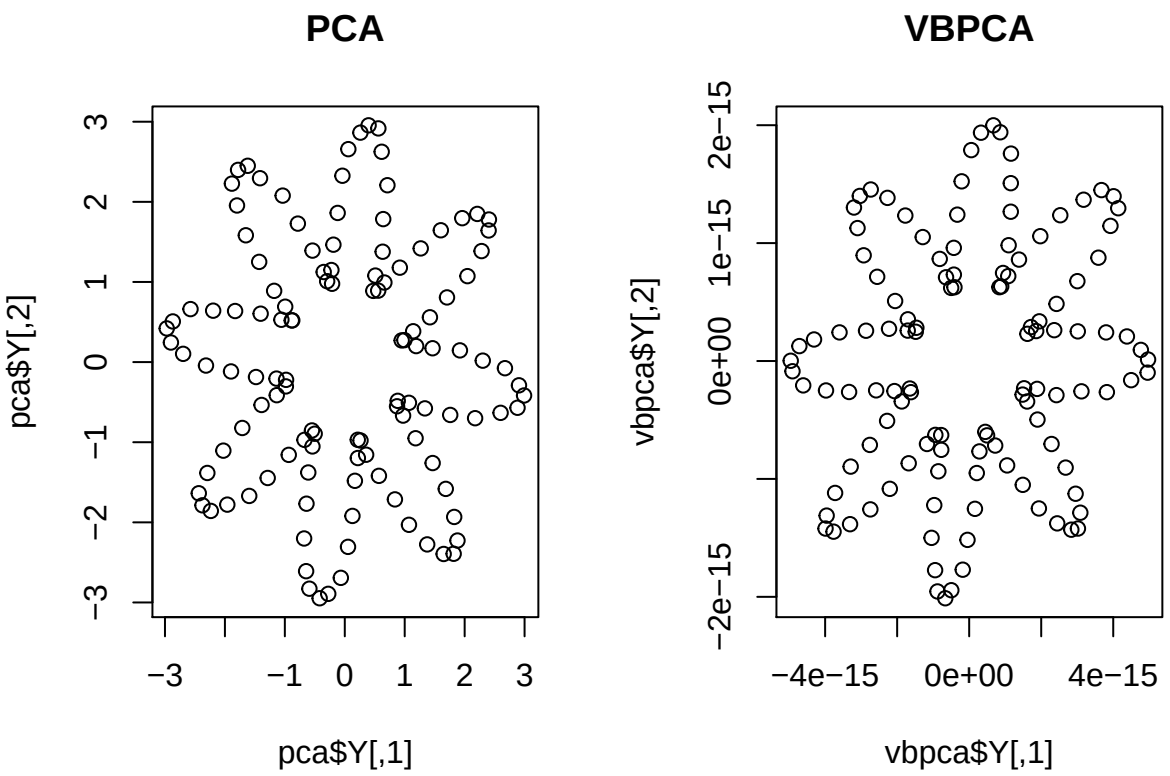
```
X <- aux.gensamples(n=120, noise=0.02, dname='helix')
```

Run PCA and VBPCA inferences

```
pca  <- do.pca(X, ndim=2, preprocess='center')
vbpca  <- do.bpca(X, ndim=2, preprocess='center')
```

Compare PCA and VBPCA by visualization

```
opar <- par(no.readonly=TRUE)
par(mfrow=c(1,2))
plot(pca$Y, main='PCA')
plot(vbpca$Y, main='VBPCA')
```




```
par(opar)
```

Print out parameter of the VBPCA algorithm

```
cat('The algorithm converges after', vbpca$mp.itercount, 'iterations.\n')
```

```
## The algorithm converges after 7 iterations.
```

```
cat('Estimated squared sigma value:', vbpca$mp.sigma2, '.\n')
```

```
## Estimated squared sigma value: 1.667846 .
```

The helix-shaped distribution of the posterior means of the latent variables is in identical shape of the standard PCA projections after 7 iterations.