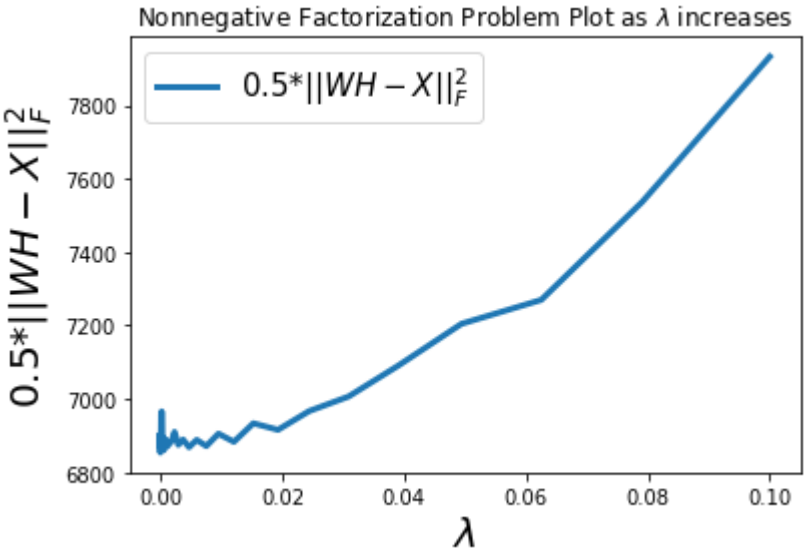
In [92]:
```
plt.plot(lambda_list, WHData, label = r"0.5*$\||WH-X||^2_F$", linewid
th = 3)
plt.legend(fontsize = 15)
plt.xlabel("$\lambda$", fontsize = 20)
plt.ylabel(r"0.5*$\||WH-X||^2_F$", fontsize = 20)
# plt.xscale('log')
plt.title('Nonnegative Factorization Problem Plot as $\lambda$ increa
ses')
plt.show()
```



Question 5

Choose a λ and extract the features matrix W by solving the nonnegative matrix factorization problem. Report the 6 features of the faces dataset, i.e., the 6 columns of matrix W. You can report the features by visualizing them in a similar way to the above example.

Marks: 12

In [81]:
```
W, H = nonNegMatFac(initParams['lambda_'], faces)
plot_gallery("Features", W.T[:6], 6, 1)
```