

# ECEN 689-606: Challenge 5 (SVM)

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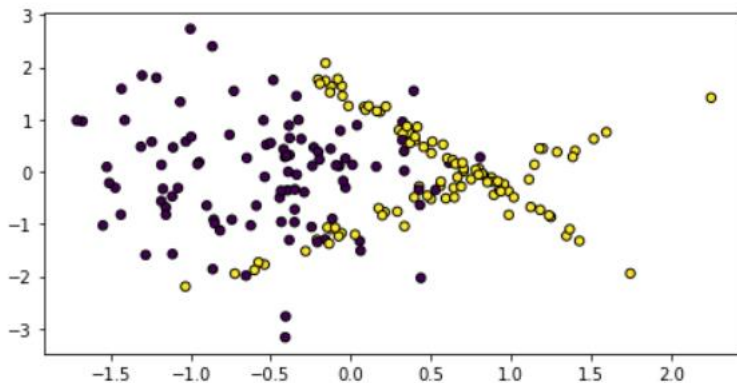
## I. TASK

To build a binary classifier based on SVM for synthetically generated data.

## II. KERNEL SELECTION FOR SVM

We know that linearly non-separable features often become linearly separable after they are mapped to a high dimensional feature space. Therefore, it's possible to create a very complex decision boundary based on a high dimensional (even infinite dimensional) feature mapping but still have an efficient computation because of the kernel representation.

There's no linear decision boundary for given data, but we'll see now how an RBF kernel can automatically decide a non-linear one. Other kernels like polynomial and sigmoid yield poorer results.



We train the SVM model using the scikit-learn package in Python which gives us an accuracy of 86.67% after doing a grid search for parameters 'gamma' and 'C'. We get the optimal 'gamma' as 0.01 and 'C' as 1000000.

