

**Note: crossed fingers or overlapping landmarks can confuse the mediapipe and cause “jittering” in the landmark positions. If this is a problem consider switching to simple MLP Linear/Dense Network. EDIT it was not**

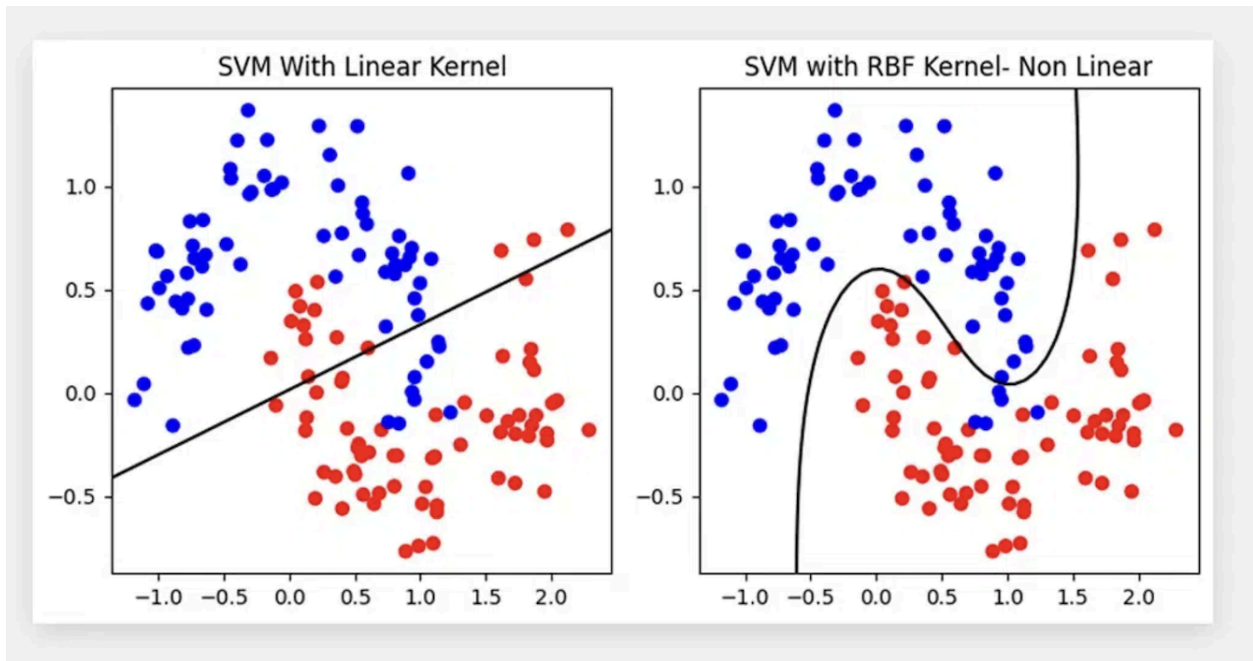
Model	Speed (Run-time)	Accuracy (Small Data)	Smoothness	Justification
KNN	Slow (Get slower with more data)	High	Low	Too slow for real-time, lazy learning is not optimal for potentially thousands of csv lines, every new line has to be compared to these as well.
Random Forest	Fast	Medium	Medium	overly sensitive to tiny jitters in hand position, Hand gestures are curved, our data is highly geometrical and non categorical, which is not a good fit
Neural Net	Fast	Low (Overfits easily)	High	Overkill for this task
RBF SVM	Fast	High	High	Best Balance with eager learning and finding boundary . RBF bell curve works best with curved

				geometric features like the ones we have
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Support Vector Machine (rbf SVM) is a great choice for gesture recognition because it often creates cleaner decision boundaries for high-dimensional data (like 129 features).

A basic Linear SVM tries to draw a straight line to separate "Thumbs Up" from "Peace Sign." But real gestures are complex; the difference between a "Fist" and "Thumbs Up" isn't a straight line.

The RBF Kernel allows the model to draw curved, flexible loops around your data clusters. It can wrap a boundary tightly around the "Thumbs Up" examples, excluding everything else.



<https://www.geeksforgeeks.org/machine-learning/linear-vs-non-linear-classification-analyzing-differences-using-the-kernel-trick/>

Rbf is best because we want Soft, curved bubbles around gesture cluster that the kernel tricks provide, not a line like in linear.

KNN would be a good starting point, but it is worse in High Dimensions or with lots of features. We have 129 so RBF would be the best choice