

Support Vector Machine

Support Vector Machines (SVMs) are powerful supervised learning algorithms used for classification, regression and anomaly detection. They are very efficient in high-dimensional spaces, even when the number of features is very large compared to the number of samples and vastly more memory-efficient as they use a subset of training points (called support vectors) in decision function. SVM can work with different kernel functions like linear, polynomial, RBF (Radial Basis Function), and sigmoid, so SVM has a wide range of applicability. Some of the main implementations are SVC, NuSVC and LinearSVC for classification and SVR, NuSVR and LinearSVR for regression. However, SVMs can be computationally exhaustive and may overfit high-dimensional data and require parameter tuning for the C (regularization) as well as γ (for RBF kernels). You can get probability estimates instead of decision scores using cross-validation though this is computationally expensive and may not match the true decision scores. When you work with data scale, Support Vector Machines require scaling to really shine, but are compatible for working around imbalancing of classes and samples by weighing the classes or samples.