Machine Learning: What are advantages of SVM over Neural networks and k- Nearest neighbours?

Leonid Boytsov, Works on knn library for generic spaces https://github.com/search ivarius/nmslib
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Neural networks outperform other methods usually if (1) there is really a lot of data (2) their structure is complex, e.g., they have many layers. In particular, if you want to solve a classification problem, you need a lot of examples **per class.**

The nearest-neighbor classifier, in contrast, doesn't need a lot of examples per class. So, if you have a classification problem with a couple of training examples per class, nearest neighbors will probably beat other methods. Even when this is not true, i.e., there is plenty of training data for each class, a decision of a kNN classifier makes a good meat-feature (for SVN or a neural network!).

SVMs do require substantially more training data than kNN, but less than neural networks (to get a decent performance). AFAIK, their disadvantage are longer training times (Disclaimer: this was in the old days, perhaps, newer training algorithms for SVM, which are based on SGD, work much faster). So, this is may not be an option if you have a lot of data. In any case, I believe that, even if you can train SVM quickly, with more data, it will be eventually outsripped by a neural network.

Well, last but not least: training algorithms for SVM have better guarantees (optimization problem is convex). Neural networks are more finicky and sometimes require quite a bit of babysitting (especially deep ones).

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