Duda et al., Pattern Classification 2e seems to have some very  relevant information.

Theoretically optimal case:

* When deciding between 2 multivariate normal distributions, the optimal decision surface will be hyperquadric (hyperplanes, hyperspheres, hyperparaboloids…)
* It does not have to be simply connected, even in 1 dimension.
* With > 2 distributions, the optimal decision surface is kind of like a Voronoi diagram but with hyperquadric surfaces.

For practical purposes of getting a complexity measure:

* Discriminant analysis, i.e. the Fisher linear discriminant, projects 2 distributions onto the line of best separation.
* You can then apply ROC analysis, which allows us to take detection bias into account in a very general way, without assuming that your loss function says the cost of a false negative = cost of a false positive.
* Multiple discriminant analysis extends this to multiple classes. It does not seem to lend itself easily to ROC analysis, but I would need to look into this further.