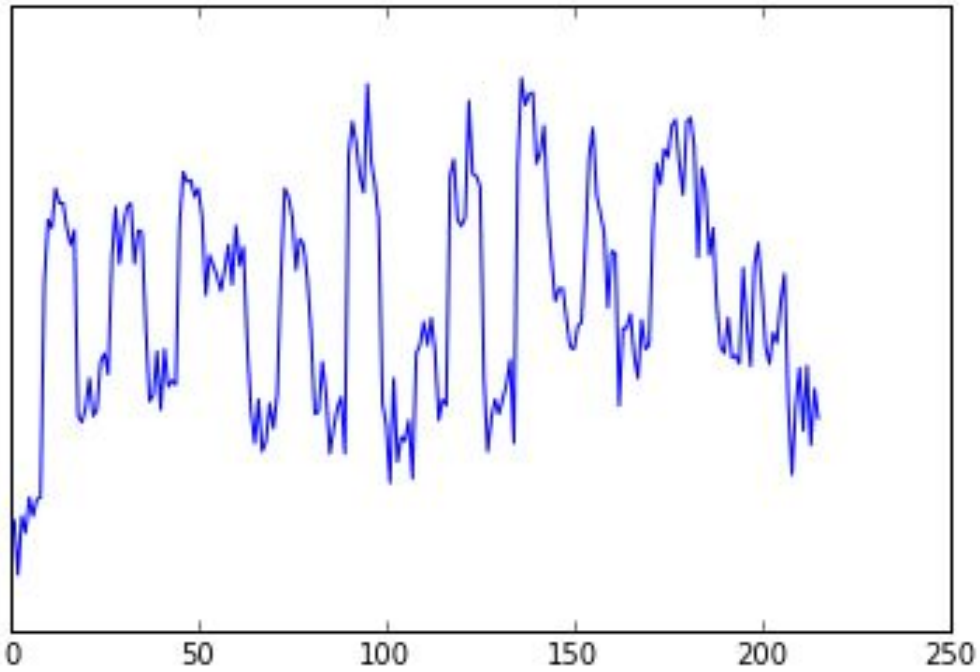
Classification

some intuitions

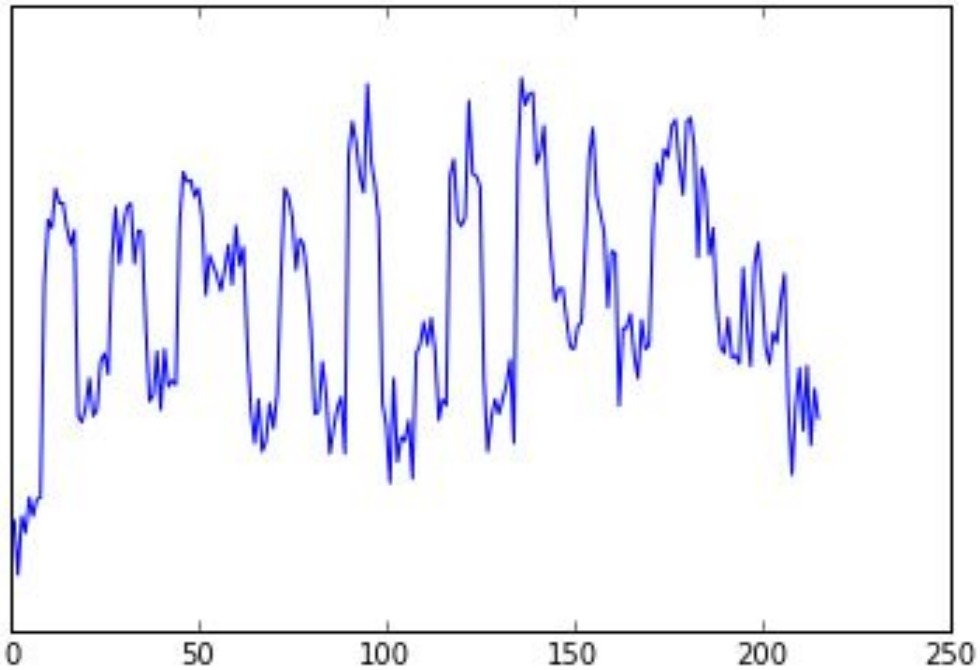
Classification in one dimension



Classification in one dimension

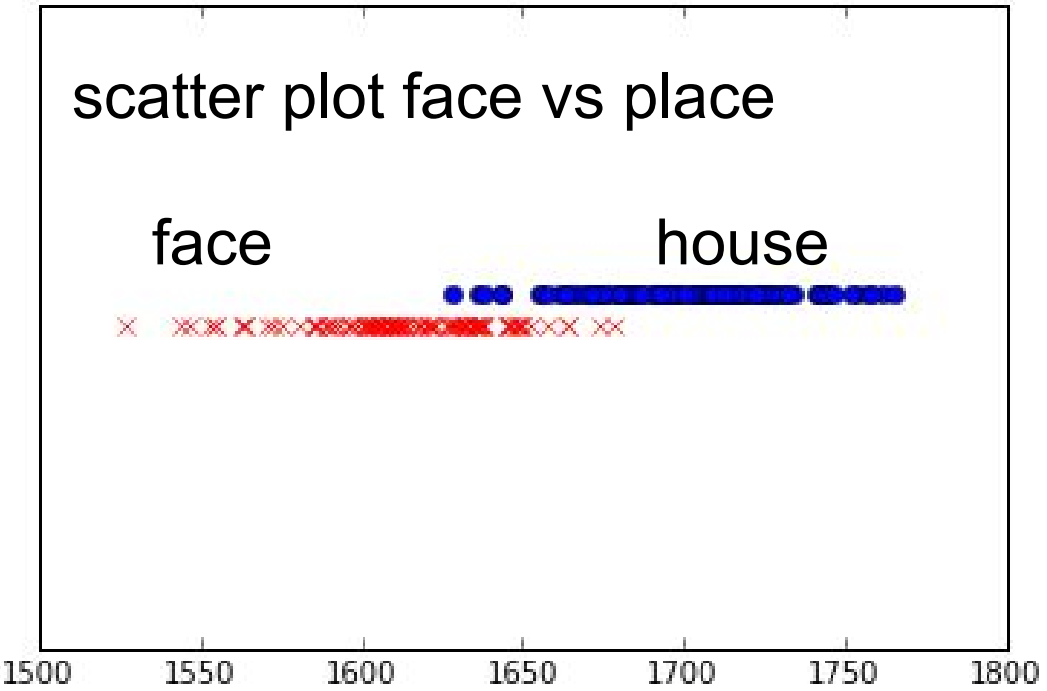
house

face



A voxel from the parahippocampal place area (PPA) while subject viewed faces or houses

Classification in one dimension



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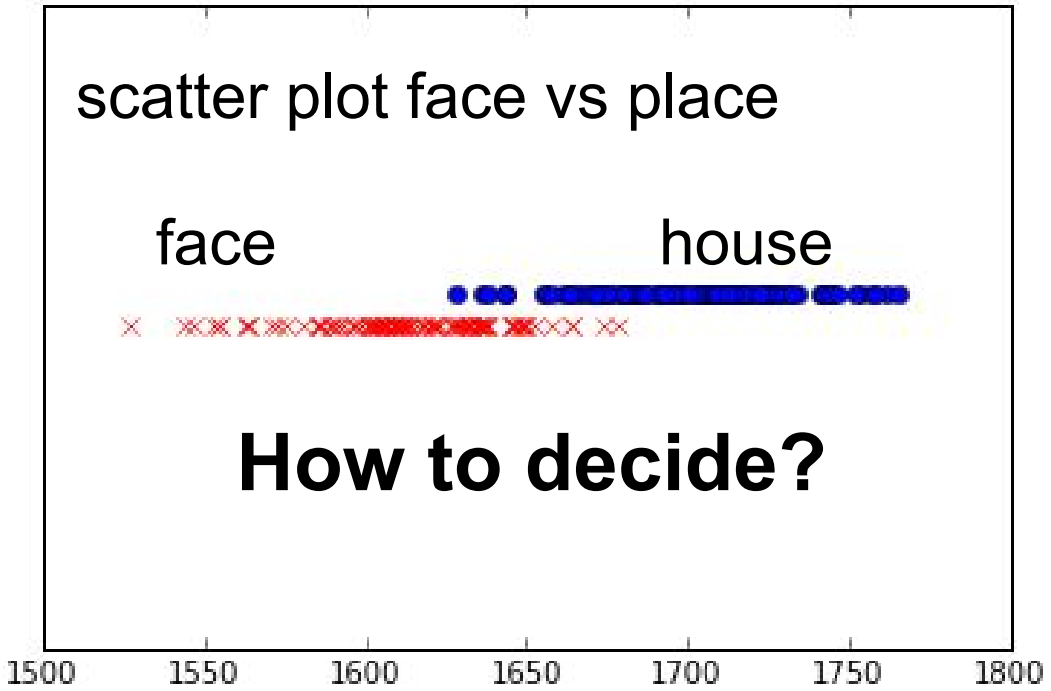
Classification in one dimension



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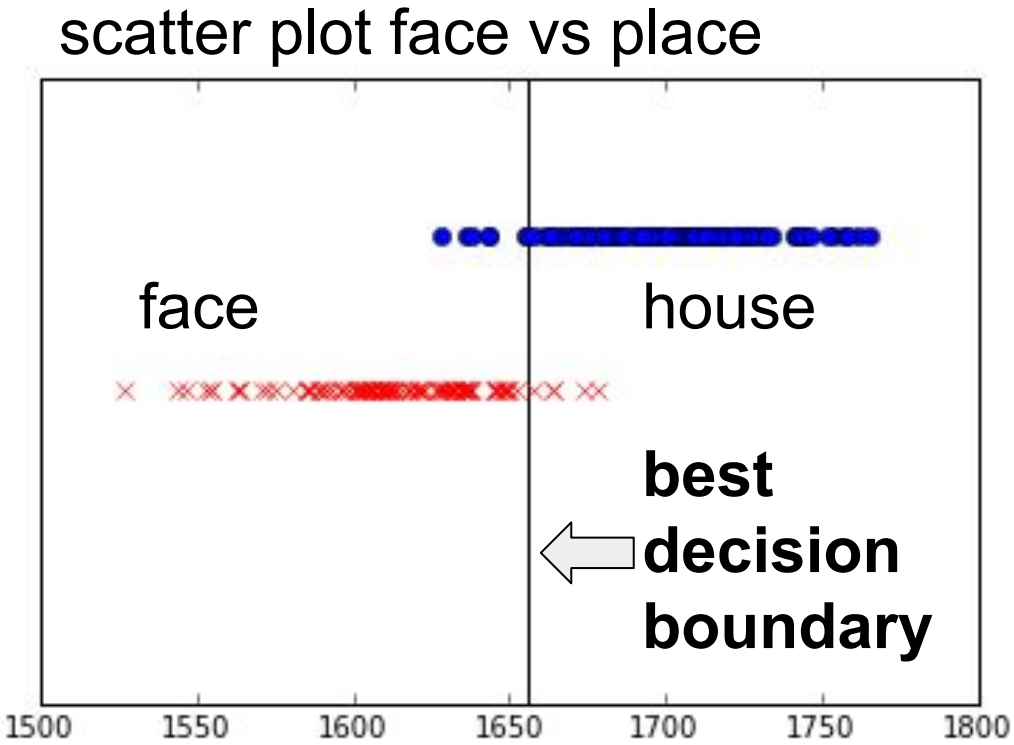
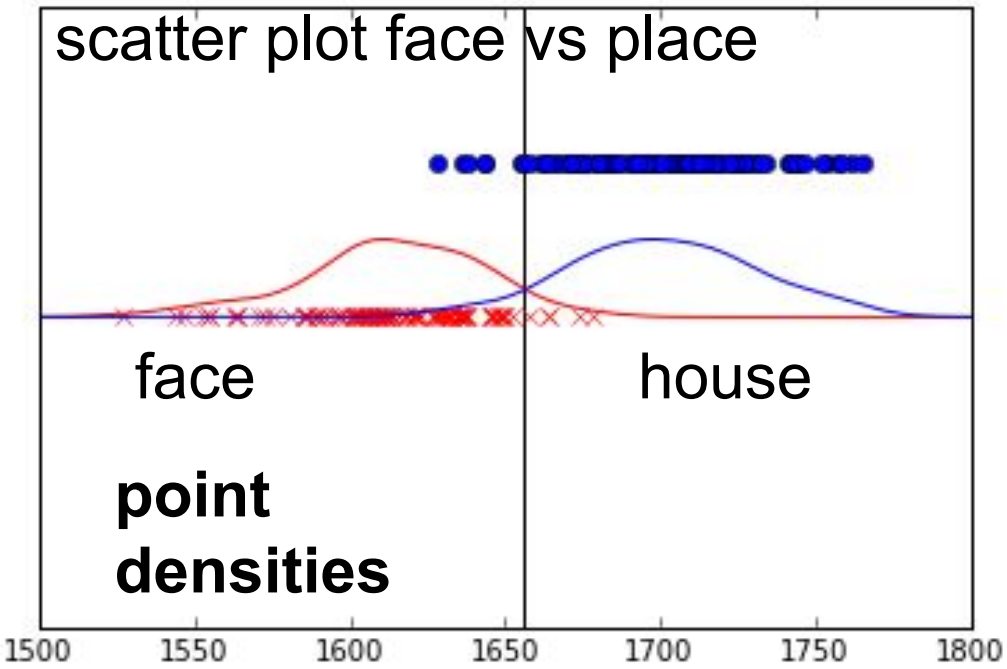
Classification in one dimension

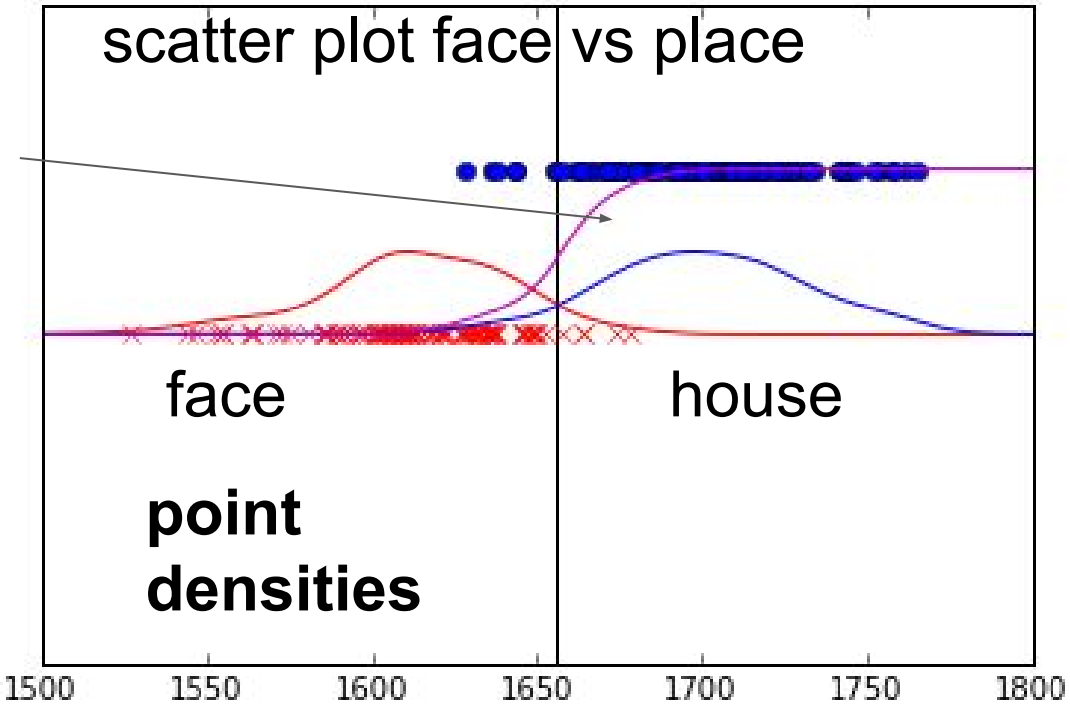


Classification in one dimension



Classification in one dimension

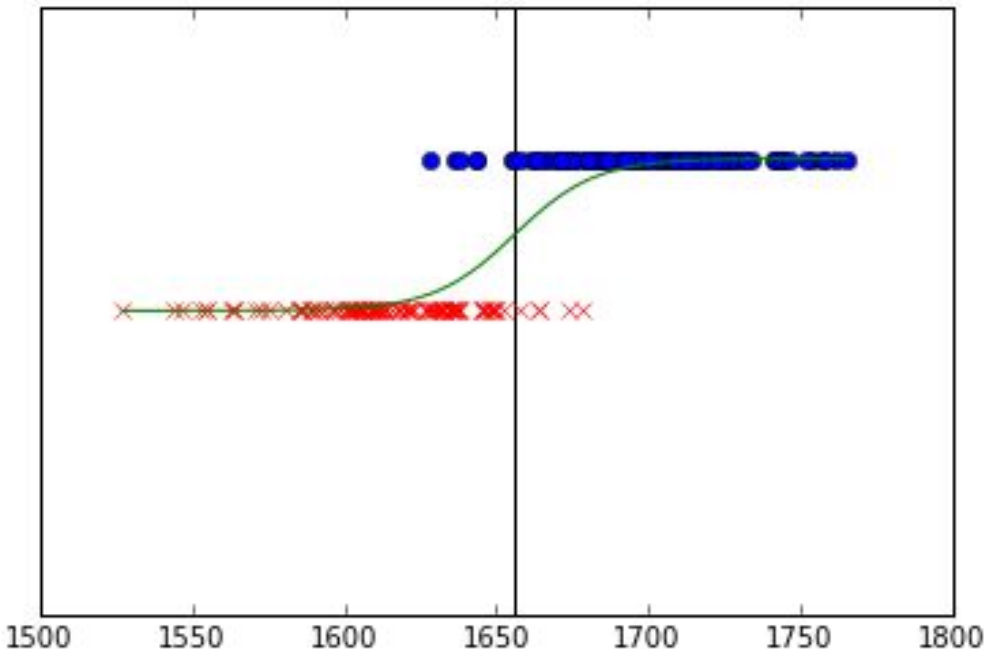
probabilistic decision function



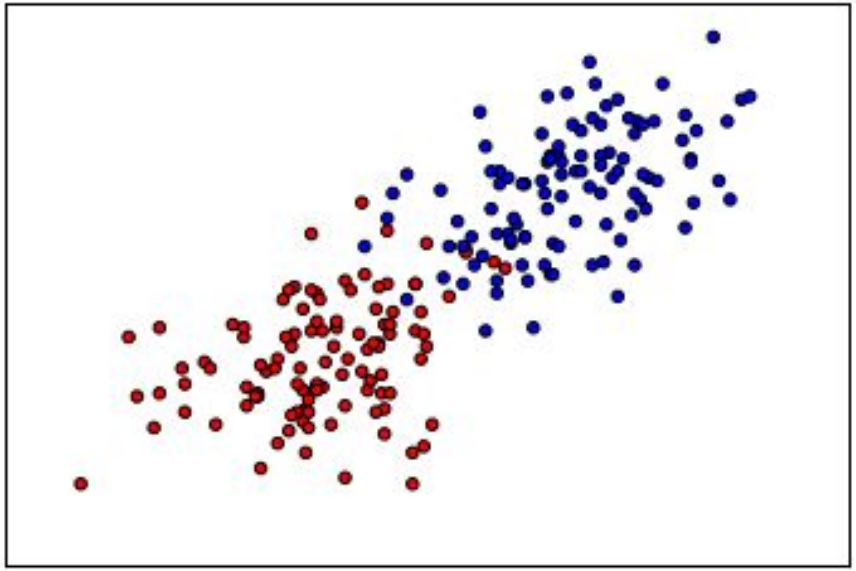
Classification in one dimension

LOGISTIC REGRESSION

probabilistic decision function



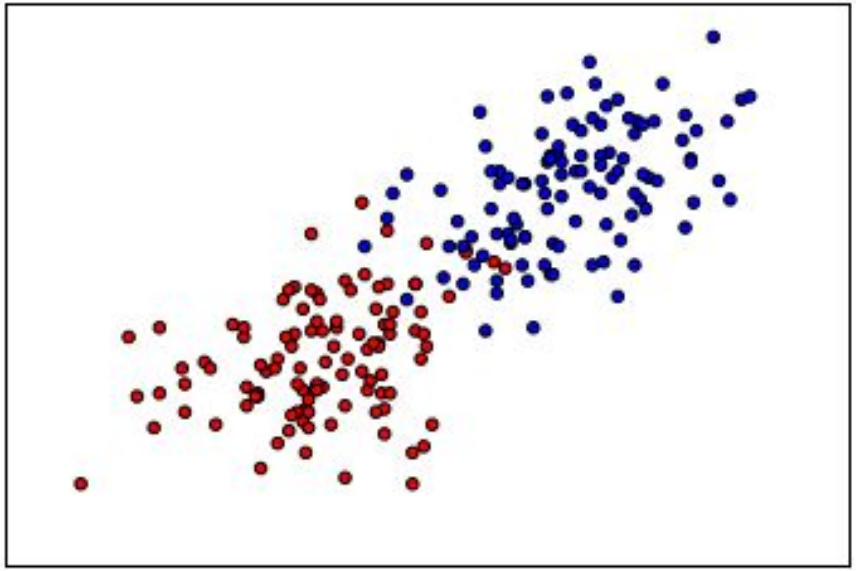
Classification in two dimensions



Two voxels from the parahippocampal place area (PPA) while subject viewed faces or houses

Classification in two dimensions

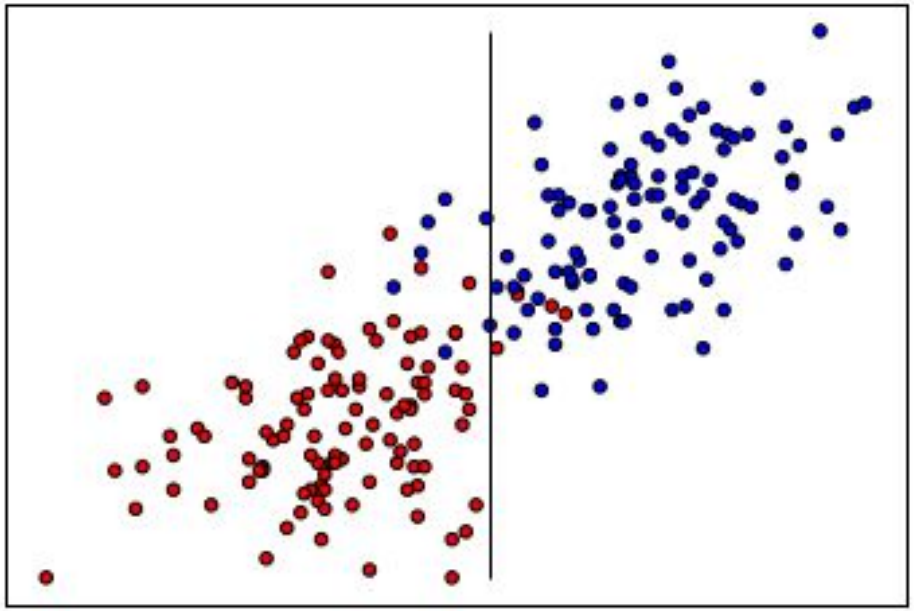
How to decide now?



Two voxels from the parahippocampal place area (PPA) while subject viewed faces or houses

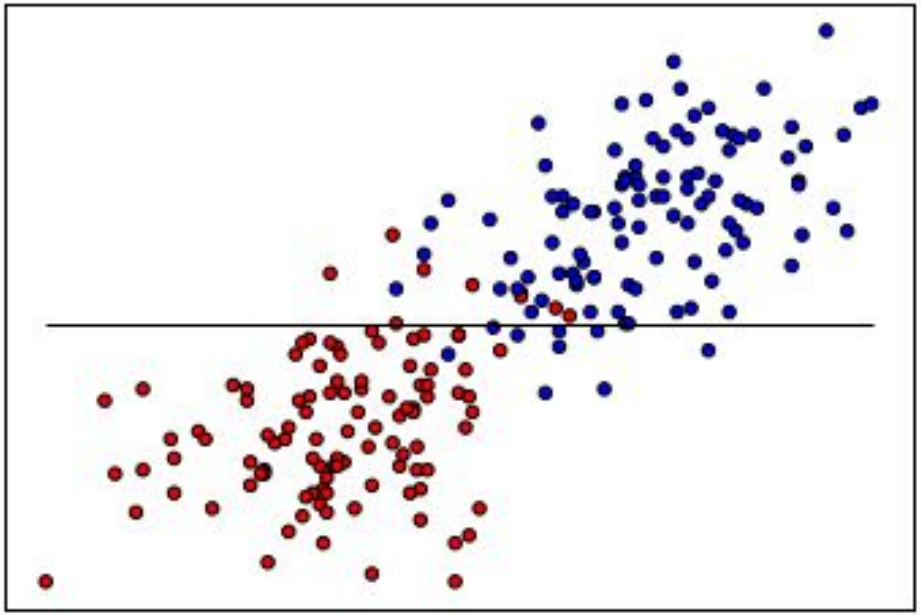
Classification in two dimensions

Decision along voxel 1



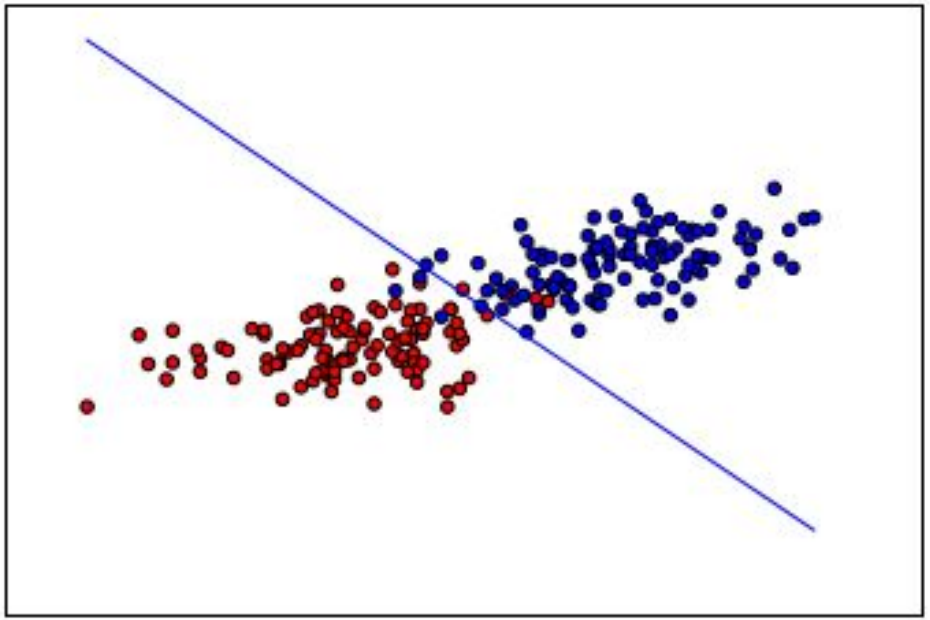
Classification in two dimensions

Decision along voxel 2



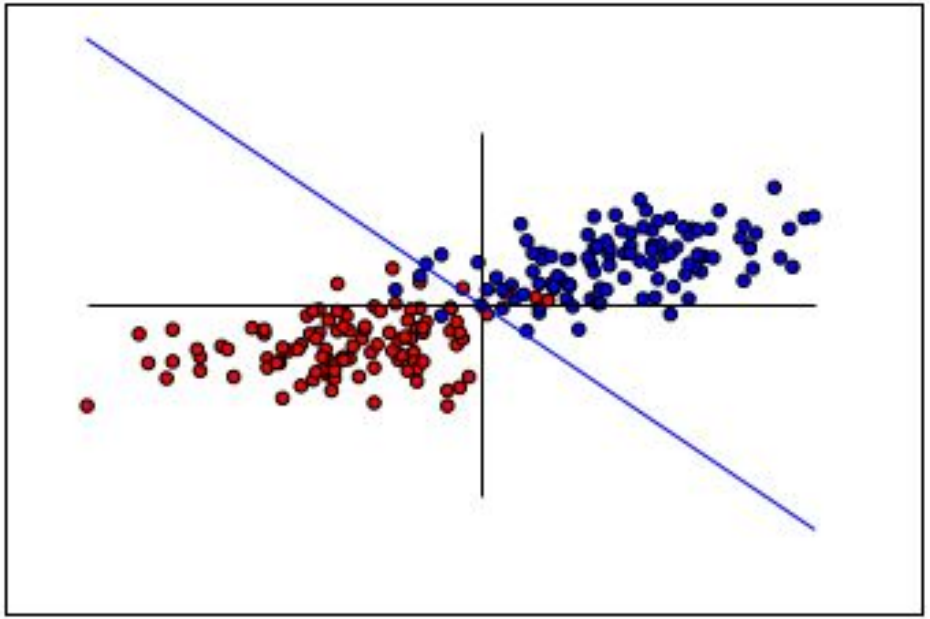
Classification in two dimensions

Multivariate decision (logistic regression)



Classification in two dimensions

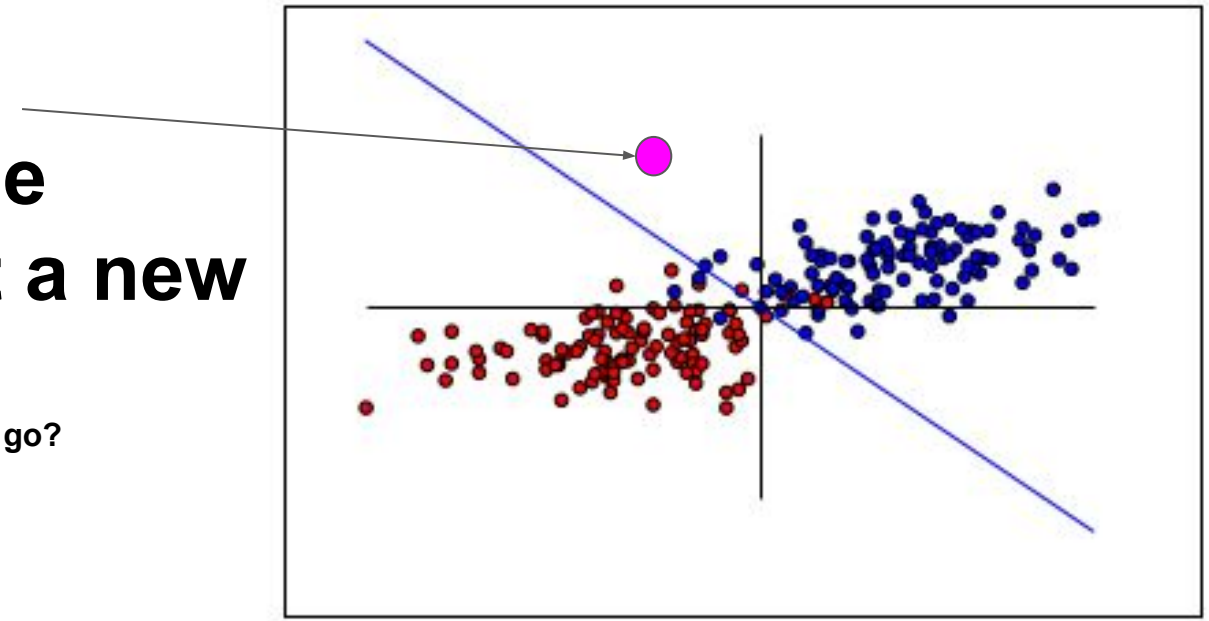
So, which one to use?



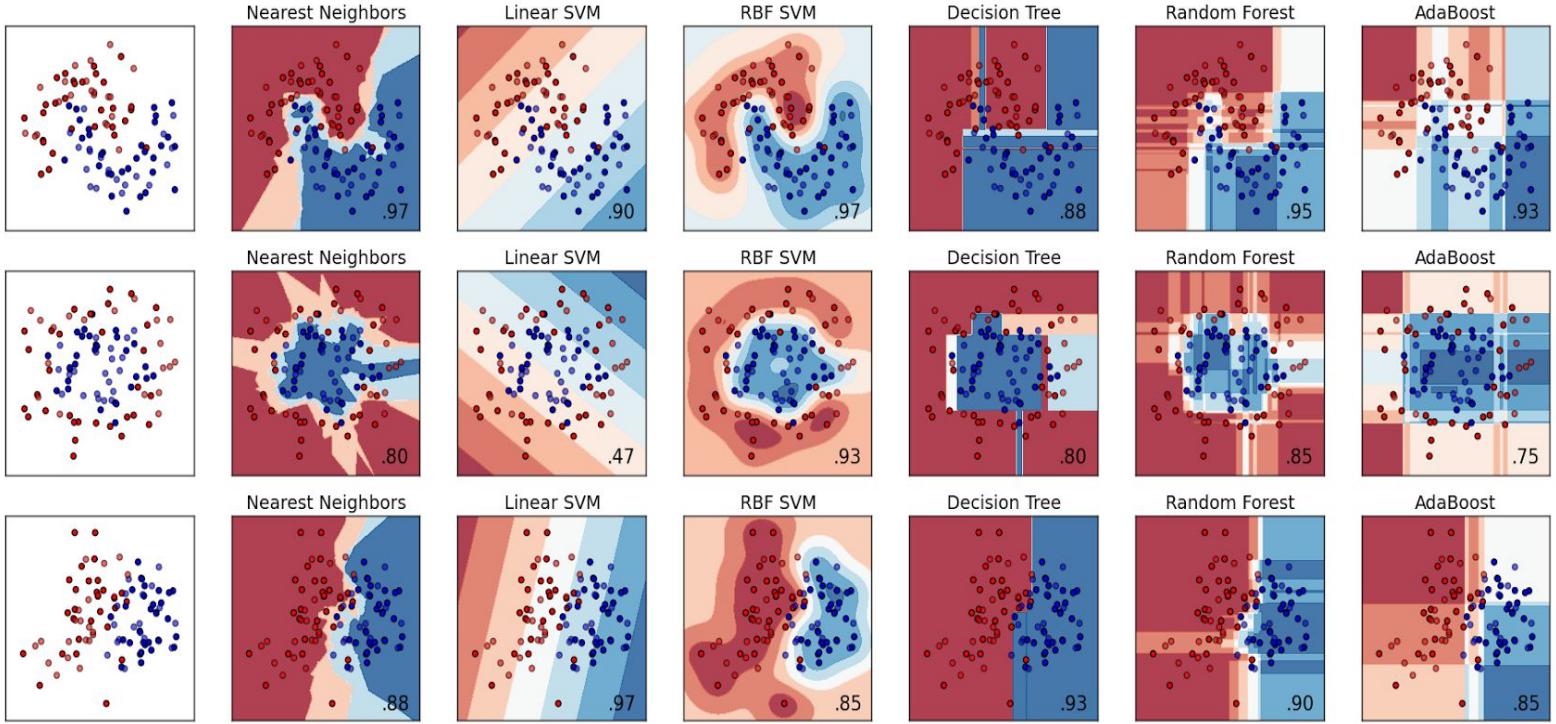
Classification in two dimensions

Decide about a new point

Where does it go?

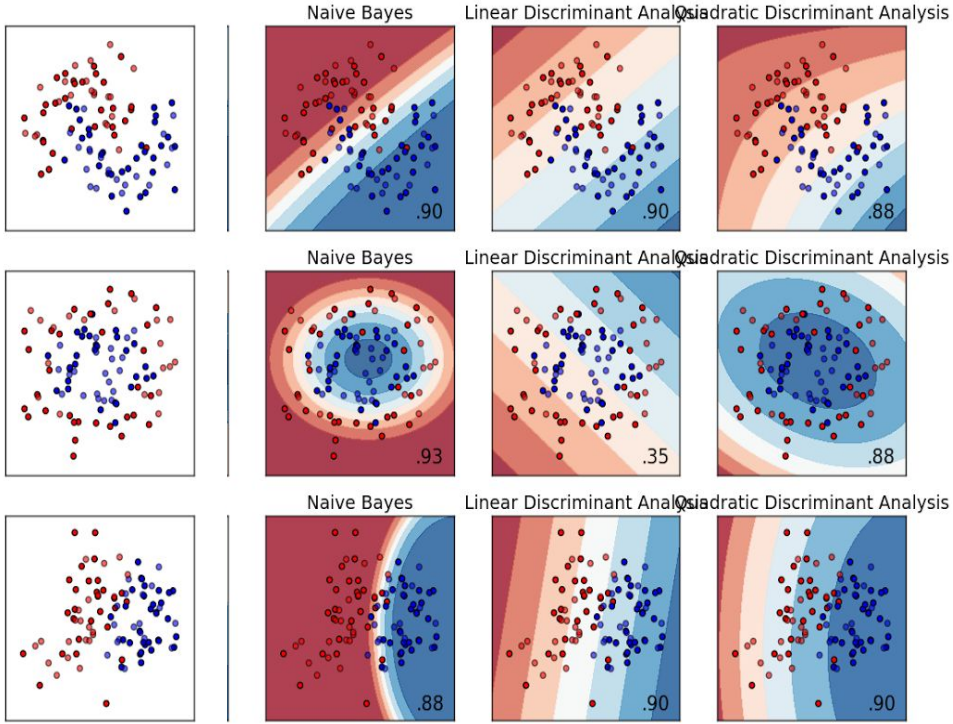


Comparing classifiers



http://scikit-learn.org/stable/_images/plot_classifier_comparison_001.png

Comparing classifiers



http://scikit-learn.org/stable/_images/plot_classifier_comparison_001.png

Conclusion

- Classification is taking decisions based on numerical data
- Different ways of classification will lead to different decisions!
- Based on domain knowledge, **You** have to choose which classifier to use, they all have advantages and disadvantages.
- **nilearn** and **scikit-learn** will help you!

Classifier tutorial

https://github.com/eickenberg/nilearn_workshop/classifier_tutorial.ipynb

How to obtain this?

In a terminal, do:

```
cd
mkdir notebooks
cd notebooks
git clone https://github.com/eickenberg/nilearn_workshop/
cd nilearn_workshop
ipython notebook
```

or: Download the zip file, unzip it, go into the directory in a terminal and run

```
ipython notebook
```