

## Workshop 8

### Projection pursuit regression

Download the R -Script file `Workshop8PPR.R` from Moodle, and save it in a sensible directory. Read the outline of the two exercises below, and then work through the code code step by step. The code is well commented with explanations.

**Exercise 1** You will create a simulated data set, where the outcome variable  $y$  based on two projections of the data. The purpose of this is to investigate the PPR procedure using data where the “truth is known”. First of all the observed predictor variables  $X_1$  and  $X_2$  are simulated as random normal variables. Then two arbitrary direction vectors  $\omega_1$  and  $\omega_2$  are defined and the outcome variable  $y$  is simulated using these two direction vectors. Only  $X_1$  and  $X_2$  are passed into the `ppr()` function, not the direction vectors.

**Exercise 2** You will use PPR to analyse the Auto data, which you have come across before. The data set is provided with James et al. in the `ISLR2` package. At the end you will compare the results with a regression tree model.