



## Overview

- ▶ **High-dimensional** data analysis  $\Rightarrow$  **regularization methods**
  - ▶ sparsity
  - ▶ low rank
- ▶ How to find a proper amount of shrinkage?
  - ▶ grid search
  - ▶ model comparison criterion
    - ▶ What is a good criterion to use?
    - ▶ There are contradictions between different criteria.
- ▶ **Problems** with cross-validation:
  1. Fixing the parameter across all folds  $\Rightarrow$  inconsistency issue
  2. Choose  $K$  for  $K$ -fold cross validation.