1

$$1 - \frac{\text{Test Error}}{\text{Var}(y)}$$

Bias-Variance Tradeoff

$$\text{MSE} = \text{Bias}^2 + \text{Variance}$$

Nonconvex $\underset{?}{\Longrightarrow}$ Higher variance

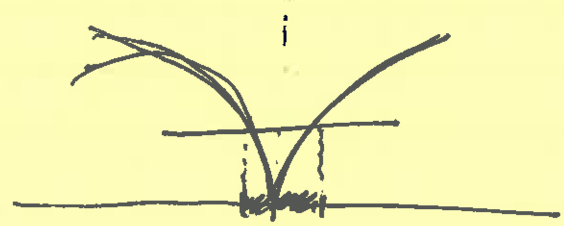
i. if we're finding local minima, then answers can jump around a lot

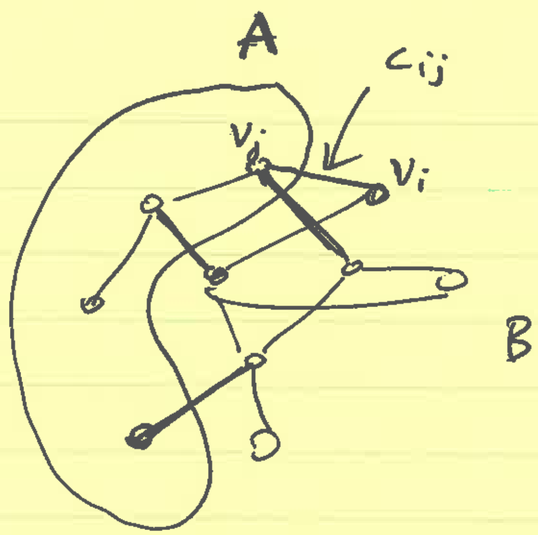
ii. often nonconvex formulations of estimators can be more "agressive" (often solutions can be discontinuous function of data)

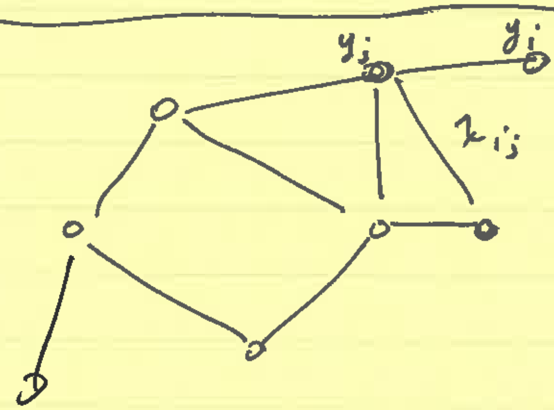
$\hat{\beta}^{\text{Lasso}}(y)$ is continuous function of y

$\hat{\beta}^{\text{subset}}(y)$ is discontinuous "

$$\min_{x,y} \; c^T x + f(y)$$
$$x \geq 0, \; Ax = b$$
$$f(y) = 0$$







Boykov.. IEEE "Graph cuts" (2001)?

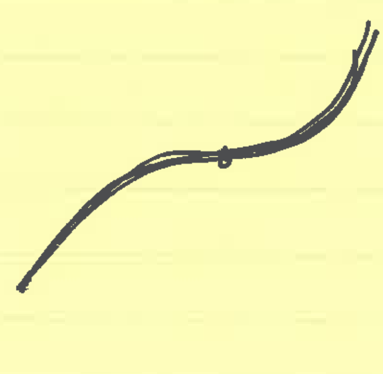
$$(y_1-\beta_1)^2 + (y_2-\beta_2)^2 + \dots (y_n-\beta_n)^2$$

$$+ \lambda|\beta_1-\beta_2| + \lambda|\beta_2-\beta_3| + \dots \lambda|\beta_n-\beta_{n+1}|$$

min

↳ $g(\beta_2)$

↳ $g(\beta_3)$



$$\underbrace{k\cdot k\cdot \dots k}_{n} = k^n$$