$$D_{KL}(\pi_{\theta'} \| \pi_\theta) \leq \epsilon$$

$$(\theta' - \theta)^T F (\theta' - \theta) \leq \epsilon$$

$$F v_i = \lambda_i v_i \longrightarrow F v_i v_i^T = \lambda_i v_i v_i^T$$

$$F = \underbrace{\sum_{i=1}^{n} \lambda_i v_i v_i^T}$$

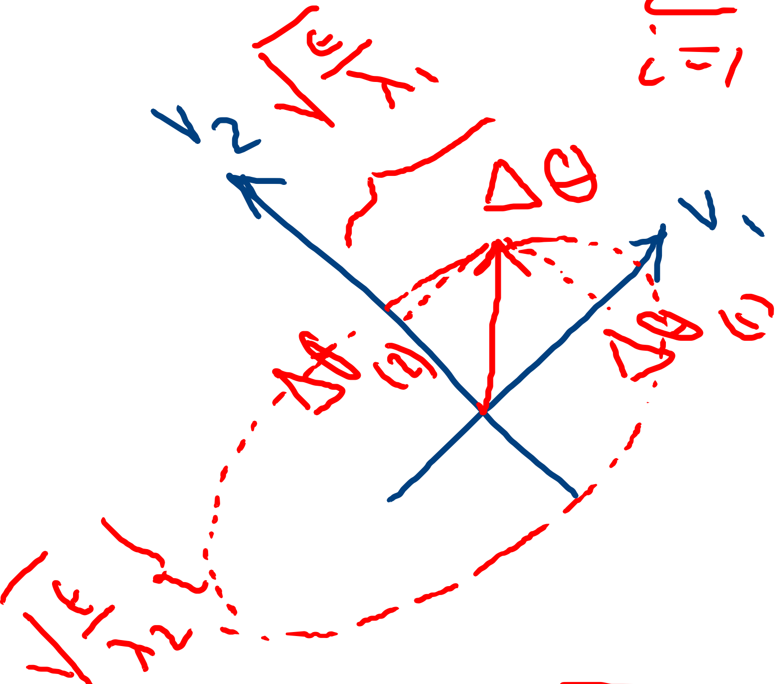
$$\rightarrow F v_j = \sum_i \lambda_i v_i \underbrace{v_i^T v_j}$$

$$= \lambda_j v_j$$

$$(\theta' - \theta)^T \sum_{i=1}^{n} \lambda_i v_i v_i^T (\theta' - \theta) \leq \epsilon$$

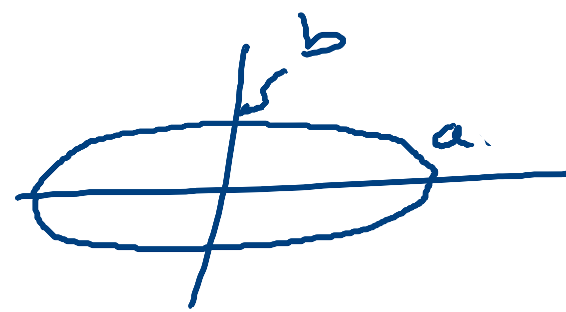
$$\hookrightarrow \sum_{i=1}^{n} \lambda_i (\theta' - \theta)^T v_i v_i^T (\theta' - \theta)$$

$$= \sum_{i=1}^{n} \lambda_i \left(\langle \underbrace{\theta' - \theta}_{\Delta\theta}, v_i \rangle \right)^2$$



$$= \sum \lambda_i \Delta\theta_{(i)}^2 \leq \epsilon$$

$$\left(\frac{x}{a}\right)^2 + \left(\frac{y}{b}\right)^2 = 1$$



$$\Delta\theta = \eta \underbrace{\nabla J}_{b}$$

$$\Delta\theta_{(i)}$$

$$\Delta\theta^T F \Delta\theta \leq \epsilon$$

$$\sum \lambda_i (\langle v_i , \underbrace{\eta b}_{\Delta\theta} \rangle)^2 \leq \epsilon$$

$$= \sum \lambda_i \eta^2 (\langle v_i , b \rangle)^2 = \eta^2 \overbrace{\sum \lambda_i (\langle v_i , b \rangle)^2}$$

$$\leq \epsilon \quad \lambda_{max} \to \infty \quad \eta \to 0$$

$$\Delta\theta = \underbrace{\eta}_{=} F^{-1} \underbrace{\underbrace{\nabla J}_{}}_{b} = \underline{\eta F^{-1} b}$$

$$\sum_{i=1}^{n} \lambda_i \left(\underbrace{\langle \Delta\theta, v_i \rangle}_{} \right)^2 \leq \epsilon$$

$$\sum_{i=1}^{n} \cancel{\lambda_i} \overbrace{\eta^2}^{\eta_i} \left(v_i^T \underbrace{F^{-1}}_{} \underbrace{b}_{} \right)^2$$

$$\frac{\ }{\lambda_i} \left(v_i^T \sum_{j=1}^{n} \lambda_j^{-1} v_j v_j^T b \right)^2$$

$$\overbrace{\left(\lambda_i^{-1} \underbrace{\cancel{v_i^T v_i}}_{1} \underbrace{v_i^T b}_{\Delta\theta_{(i)}} \right)^2}$$

$$F v_i = \lambda_i v_i$$

$$v_i = \lambda_i F^{-1} v_i$$

$$F^{-1} v_i = \frac{1}{\lambda_i} v_i$$