

Answer 2 (a)

quadratic error f^o

$$E = \frac{1}{2} \lambda_1 \omega_1^2 + \frac{1}{2} \lambda_2 \omega_2^2$$

$$\frac{\partial E}{\partial \omega_1} = \frac{1}{2} \lambda_1 \times \omega_1 + 0 = \lambda_1 \omega_1$$

$$\frac{\partial E}{\partial \omega_2} = \frac{1}{2} \lambda_2 \times \omega_2 + 0 = \lambda_2 \omega_2$$

$$\frac{\partial^2 E}{\partial \omega_1^2} = \lambda_1$$

$$\frac{\partial^2 E}{\partial \omega_2^2} = \lambda_2$$

So after taking 2nd derivative of Error f^o we are getting
 λ_1 & λ_2 as a eigen value of Hessian matrix