

ECE C143A Homework 6

Lawrence Liu

April 22, 2022

Problem 1

(a)

False, the Na^+ channel opens first

(b)

True

(c)

True

(d)

False, EEG's cannot record action potentials.

(e)

False because λ does not vary with time and a poisson process is memoryless.

(f)

True

(g)

Problem 2

(a)

$f(\theta)$ reaches a max at $\theta = \theta_0$ therefore this is the preferred direction.

(b)

No because the values of the tuning curve would all be negative

(c)

$$\begin{aligned}\cos(\theta - \theta_0) &= e^{j(\theta - \theta_0)} \\ &= (\cos(\theta) + j \sin(\theta))(\cos(\theta_0) - j \sin(\theta_0)) \\ &= \cos(\theta) \cos(\theta_0) + \sin(\theta) \sin(\theta_0)\end{aligned}$$

(d)

$$k_0 = c_0$$

$$k_1 = \sin(\theta_0)$$

$$k_2 = \cos(\theta_0)$$