

# ECE531 Homework Assignment Number 8

Due by 8:50pm on Wednesday 6-Apr-2011

Make sure your reasoning and work are clear to receive full credit for each problem.

1. 5 points. Suppose  $Y$  is a scalar observation drawn from a parameterized Poisson distribution

$$p_Y(y; \theta) = \text{Prob}(Y = y) = \frac{\theta^y e^{-\theta}}{y!}$$

for  $y = 0, 1, 2, \dots$ . Find the Fisher information  $I(\theta)$  and the CRLB for estimating the scalar parameter  $\theta$ . Confirm all of the regularity conditions are satisfied. Can you find an MVU estimator that achieves the CRLB in this case?

2. 4 points. Kay I: 3.3. Confirm all of the regularity conditions are satisfied.
3. 4 points. Kay I: 3.4. You can assume all of the regularity conditions are satisfied.
4. 4 points. Kay I: 3.9. You can assume all of the regularity conditions are satisfied.
5. 4 points. Kay I: 3.12.
6. 4 points. Kay I: 3.17. This is an extension of example 3.14, so you can assume all of the regularity conditions are satisfied.