Lecture 14

· Recall: Priors + Posteriors for Poisson n = 0, X, =0 (successes)

Indifference / P(0) ≈ 1

0 ~ Gamma (1,0)

0 | X ~ Gamma (ZX, +1, n)

*improper \$ \$ 0 * always proper

Jeffrey's / P_ (O) ~ \T(O)

9 ~ Gamma (1/2 0) * improper, \$ #0

0/X ~ Gamma (EX, + 1/2 11) * always proper

0 ~ Gamma (0,0) Haldane/

O / X ~ Bamma (EX: n)

* improper, a+0, B=0

* improper when no successes

 $\frac{\partial_{\text{MMSE}}}{\partial_{\text{MSE}}} = \frac{\left(\frac{n}{n}\right)}{n+\beta} = \frac{\sum x_{1}}{n+\beta} + \frac{\alpha}{n+\beta} = \frac{\sum x_{2}}{n} + \frac{\alpha}{n+\beta} + \frac{\alpha}{n+\beta} + \frac{\alpha}{n+\beta} = \frac{\sum x_{2}}{n} + \frac{\alpha}{n+\beta} + \frac{\alpha}{n+\beta} = \frac{\sum x_{2}}{n} + \frac{\alpha}{n+\beta} + \frac{\alpha}{n+\beta} = \frac{\sum x_{2}}{n+\beta} + \frac{\alpha}{n+\beta} = \frac{\alpha}{n+\beta} = \frac{\sum x_{2}}{n+\beta} = \frac{\sum x_{2}}{n+\beta} + \frac{\alpha}{n+\beta} = \frac{\sum x_{2}}{n+\beta} = \frac{\sum x_{2}}{n+\beta} + \frac{\alpha}{n+\beta} = \frac{\alpha}{n+\beta} = \frac$ · ÔMMSE

let $\left(\frac{B}{n+B}\right) = \varrho$ then $\left(\frac{n}{n+B}\right) = 1 - \varrho$ AND $\sum X_i/n = \theta_{MLE}$

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 $= E[\theta|X] = \rho E[\hat{\theta}] + (1-\rho) \hat{\theta}_{ME}$ * Shrinkage Estimator

 $\lim_{n\to\infty} \ell = 0$ SO E[OIX] shinks to BMLE

Posterior Prediction Distribution

Qiven
$$X^*$$
 and $n^*=1$ new trials, what's the new posterior prediction

$$P(X^*|X) = \int_{\Theta} P(X^*|\Theta) P(\theta|X) d\Theta$$

$$= \int_{\Theta} (\frac{x^*}{X^*!}) \int_{\Theta} (\frac{x^*}{X^*!} + \frac{x^*}{Y^*!}) d\theta$$

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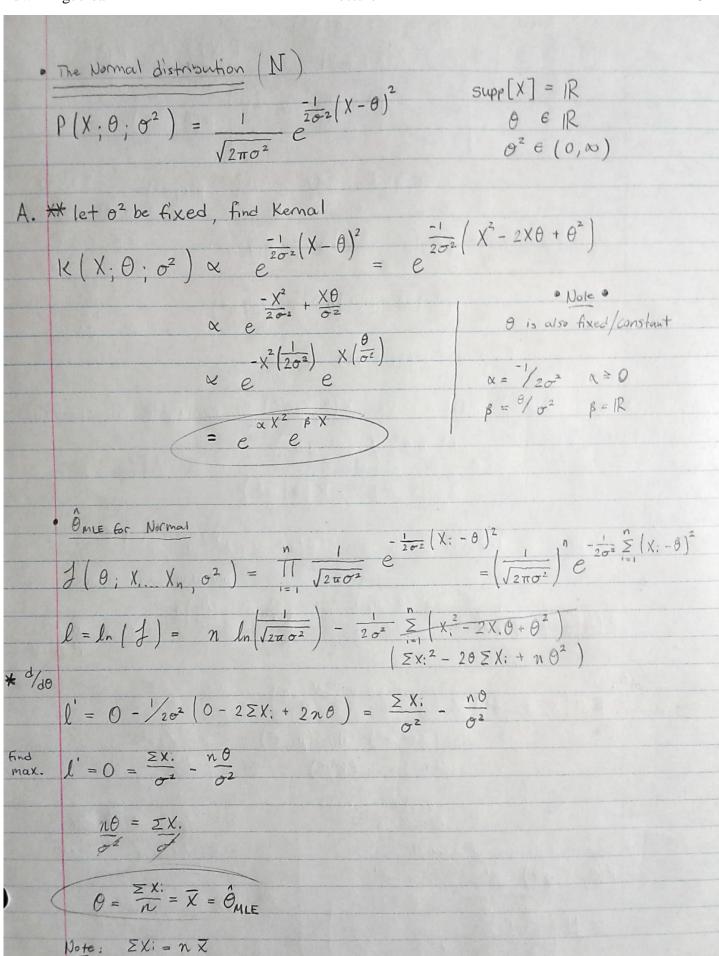
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$$= \int_{\Theta} (\frac{x^*}{Y^*} + \frac{x^*}{Y^*}$$



Edwin Figueroa Lecture 14 4

fixed
$$P(\theta|x_{1}, x_{1}; \sigma^{2}) = \frac{P(X|\theta, \sigma^{2}) P(\theta|\sigma^{2})}{P(X|\sigma^{2})} \times P(X|\theta; \sigma^{2}) P(\theta|\sigma^{2})$$

$$= \frac{1}{\sqrt{2\pi}\sigma^{2}} \sum_{i=1}^{N} \frac{1}{2\sigma^{2}} \sum_{i=1}^{N} \frac{1}{\sigma^{2}} \sum_$$