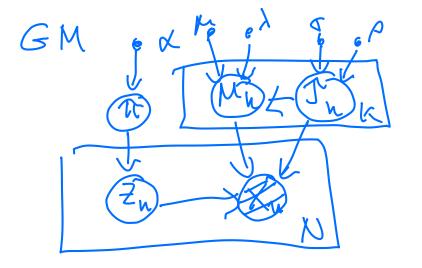


Royal Institute of Technology

VI FOR GIMM



R.V. $X = \{X_n : n \in TNJ\}$ $Z = \{Z_n : n \in TNJ\}$ $M = \{X_n : n \in TNJ\}$ $M = \{X_n : n \in TNJ\}$ $T = \{X_n : n \in TNJ\}$

TILX ~ DIV (x) = TT TINKh-1 Zulana Cut(a) In 10,p~ GalV,p) = por Thomas e-pin Mh | Thimid ~ N (M, (M, -M)) = [The e - XTh (Mn - M) $X_{h}|Z_{h}^{2}h_{1}\mu_{h},T_{h} \wedge NL\mu_{h},(T_{h})^{-1})=\sqrt{T_{h}}e^{-\frac{T_{h}}{2\pi}}(X_{h}-\mu_{h})$ Noticed that i torgot the precision, i.e. In/

GM X Med Juk

N.V. $X = \{X_n : n \in LNJ\}$ $Z = \{Z_n : n \in LNJ\}$ $M = \{M_n : n \in LKJ\}$ $T = \{X_n : n \in LKJ\}$

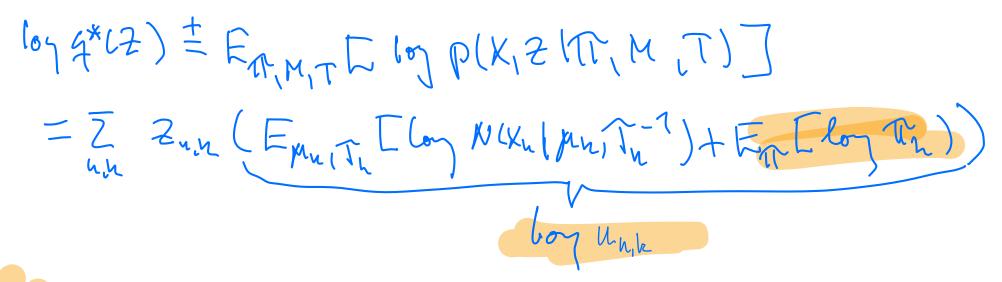
Joint p(K, Z, 11, M,T) = p(X,Z/11, M,T)p(T) p(M,T) 11 ass G(Z, T, M, T) = G(Z) G(T, M, T) Notation Zuto Znormancj Zuck (Zne I, Znu = 0 Hk/x k Complete like $p(x,z|\Omega,M,T) = \prod_{n} p(x_n|z_n,M,T)p(z_n|\Omega)$ - IT [p(xn/Mn, Th) p(Zn=1/II) Jenh = TI [N(Xh | Mhs Th-1) The]tuh

Joint plk, Z, II, M,T) = p(X,Z|II, M,T)p(IT) p(M,T) P(X,Z/M,M,T)=TT [N(Xh/MhsTh-1) Mn]Zuh loy 4*12) = EMMIT [10] P(X, ZIT, M, T)] = Z Zun (Emusti [lon N(Xu/pnstu)+ En [lon th)) lon Unic = 2 Zur log ank o o g*(2) x II Unit x II (E hash) Joint plk, Z, M, M, T) = p(X, Z/M, M, T)p(T) p(M, T) P(X,Z/M,M,T)=TI [N(Xh/Mh,Th-1) Mn]tuh loy 4* (M, M,T) = Ez [loy p(x,Z[M,M,T)]+loy p(M)+lonp(M,T) = Z Ez [Znih] lon N(Xn | Jun 17h-1) + Z Ez [Znih] lon Tik + I (xn-1) boy Tru + I long p(kn, Th) Note: (1) no term with to and (pm or In)

(2) - 11 - hand h' for hth .: 4×(M,M,T) tactorized as G(W) TI G(M,ITh)

log GN (pr. T | m, l, S, V) = (s-1) log T - VT + 1 log T + 1 log (- TL (M2-2 Mm + M2) 164 gx (ph 17h) = \frac{1}{2} \left V_{h,h} \left \left \frac{1}{2} \left \frac{1}{2} \left \l + 2 log In - Ind (mn-m) = (J-1+12 run) log Ty + 1 log Jn - (p+2/2+12 run Xn2) Th - In (1 + 2 run) Mn + In (2 1 M + 2 E run Xn) Mh $= \frac{1}{2} \log T_{h} - \frac{1}{2} \ln^{2} \left(\mu_{h} - \mu^{*} \right)^{2} + \left(\int^{*} -1 \right) \log T_{h} - \left(a - \frac{1}{2} \ln^{2} \right) T_{h}$ $J^{*} = J + \frac{1}{2} r_{nn} \qquad \mu^{*} = \left(\frac{1}{2} \mu + \frac{1}{2} r_{nn} x_{n} \right) / \left(\frac{1}{2} + \frac{1}{2} r_{nn} x_{n} \right)$ $P^{*} = P + \frac{1}{2} \mu^{2} + \frac{1}{2} \sum_{n} r_{nn} x_{n}^{2} - \frac{1}{2} \frac{1}{2} \mu^{*} x_{n}^{2}$ 「*コイナーランVnik

q(M,M,T) tactorize as q(W) TI q(Mn)Th) Joint b(K, Z, II, M,T) = p(X,Z|II, M,T)p(III)p(M,T) P(X LZ, M,T) P(ZIM) = Th Thun by 4* (17) = E_T [by p(x, z, a, M, T)] $= E_{-\Pi} \int_{u,h} \left[\sum_{u,h} \log_{\Pi} \pi_{h} + \sum_{h} (\alpha_{n}-1) \log_{\Pi} \pi_{h} \right]$ $= \frac{\sum_{n,n} \Gamma_{n,n} \log_{n} \Gamma_{n,n} + \sum_{n} (x_{n}-1) \log_{n} \Gamma_{n}}{\sum_{n} \Gamma_{n,n} + \sum_{n} \Gamma_{n,n} + \sum_{n} \Gamma_{n,n}} + (x_{n}-1) \log_{n} \Gamma_{n} + \sum_{n} \Gamma_{n,n} \log_{n} + \sum_{n} \Gamma_{n,n} \log_{n} \Gamma_{n} + \sum_{n} \Gamma_$



- DEntloy Mid: use digamuna
- DET Lon Juse digamma
- 5 ETITAJ: is shape /rate
- 4 ETn/Mn [Th (Xn-Mn 12]

(4) ETHIME I TH (Xn-Mn 12] Tu C= V= ETHINITATENTALTERS = ETh LIn EME (Xn-Mn) ITus] = EIL IJ Eph [Xn-2xn Mh + Mh] IIh] $= F_{1} \left[T_{1} \left(x_{n}^{2} - 2x_{n} m + \frac{1}{T_{1}} c + m^{2} \right) \right]$ $= C + E_{T_h} [T_h] (x_h^2 - 7x_h m + m^2)$ use Shpe/rate

Em [My [Th] = m