情報システム工学科

2009 年 4 月 12 日

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進捗状況

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1 FBM

1.1 バイアス無し

$$E(\boldsymbol{v}) = -\sum_{i=1}^{D}\sum_{k=i+1}^{D} v_i L_{ik} v_k \tag{1}$$

$$u_i = \sum_{k=1}^{D} L_{ik} v_k \tag{2}$$

$$\tag{3}$$

1.2 バイアス有り (1)

$$E(\boldsymbol{v}) = \sum_{i=1}^{D} a_i v_i - \sum_{i=1}^{D}\sum_{k=i+1}^{D} v_i L_{ik} v_k \tag{4}$$

$$u_i = -\sum_{k=1}^{D} a_i v_k + \sum_{k=1}^{D} L_{ik} v_k \tag{5}$$

$$\tag{6}$$

1.3 バイアス有り (2)

$$E(\boldsymbol{v}) = \sum_{i=1}^{D} a_i v_i - \sum_{i=1}^{D}\sum_{k=i+1}^{D} v_i L_{ik} v_k \tag{7}$$

$$u_i = -\sum_{k=1}^{D} a_k v_k + \sum_{k=1}^{D} L_{ik} v_k \tag{8}$$

$$\tag{9}$$

1.4 バイアス有り (3)

$$E(\boldsymbol{v}) = \sum_{i=1}^{D} a_i v_i - \sum_{i=1}^{D}\sum_{k=i+1}^{D} v_i L_{ik} v_k \tag{10}$$

$$u_i = -\sum_{k=1}^{D} a_i v_i + L_{ik} v_k \tag{11}$$

$$\tag{12}$$

1.5 バイアス有り (4)

$$E(\boldsymbol{v}) = \sum_{i=1}^{D} a_i v_i - \sum_{i=1}^{D}\sum_{k=i+1}^{D} v_i L_{ik} v_k \tag{13}$$

$$u_i = a_i + \sum_{k=1}^{D} L_{ik} v_k \tag{14}$$

$$\tag{15}$$

2 GBM

2.1 バイアス有り

$$E(\boldsymbol{v},\boldsymbol{h}) = \sum_{i}^{D} a_i v_i + \sum_{j}^{P} b_j h_j \tag{16}$$

$$- \frac{1}{2}\sum_{i,k}^{D} v_i L_{ik} v_k - \frac{1}{2}\sum_{j,m}^{P} h_j J_{jm} h_m - \sum_{i=1}^{D}\sum_{j=1}^{P} v_i W_{ij} h_j \tag{17}$$

$$p(h_j = 1|\boldsymbol{v},\boldsymbol{h}_{-j}) = \sigma(-b_j + \sum_{i=1}^{D} v_i W_{ij} + \sum_{m=1\backslash m}^{P} J_{jm} h_m) \tag{18}$$

$$p(v_i = 1|\boldsymbol{h},\boldsymbol{v}_{-i}) = \sigma(-a_i + \sum_{j=1}^{P} W_{ij} h_j + \sum_{k=1\backslash i}^{D} L_{ik} v_k) \tag{19}$$

$$\mu_j \leftarrow \sigma(-b_j + \sum_{i=1}^{D} v_i W_{ij} + \sum_{m=1\backslash j}^{P} \mu_m J_{mj}) \tag{20}$$

$$\tag{21}$$

2.2 バイアス無し

$$E(\boldsymbol{v},\boldsymbol{h}) = -\frac{1}{2}\sum_{i,k}^{D} v_i L_{ik} v_k - \frac{1}{2}\sum_{j,m}^{P} h_j J_{jm} h_m - \sum_{i=1}^{D}\sum_{j=1}^{P} v_i W_{ij} h_j \tag{22}$$

$$p(h_j = 1|\boldsymbol{v},\boldsymbol{h}_{-j}) = \sigma(\sum_{i=1}^{D} v_i W_{ij} + \sum_{m=1\backslash j}^{P} J_{jm} h_m) \tag{23}$$

$$p(v_i = 1|\boldsymbol{h},\boldsymbol{v}_{-i}) = \sigma(\sum_{j=1}^{P} W_{ij} h_j + \sum_{m=1\backslash i}^{D} L_{im} v_m) \tag{24}$$

$$\mu_j \leftarrow \sigma(\sum_{i=1}^{D} v_i W_{ij} + \sum_{m=1\backslash j}^{P} \mu_m J_{mj}) \tag{25}$$

$$\tag{26}$$