

PUBLISHER CORRECTION

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Publisher Correction: scParser: sparse representation learning for scalable single-cell RNA sequencing data analysis

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The original article can be found online at <https://doi.org/10.1186/s13059-024-03345-0>.

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Following publication of the original article [1], the authors identified a typesetting error in Eq. 3, 4 and 10, as well as in Algorithm 1 equation. An erroneous “*l*” was typeset at the start of the equations.

The incorrect and corrected versions are published in this correction article.

Incorrect equation (3)

$$\left\{ \begin{array}{l} ll\mathcal{L}(d, p, v, s, g) = \frac{1}{2} \sum_{i,m} (z_{i,m} - d_j^\top v_m - p_t^\top v_m - s_i^\top g_m)^2 + \\ \quad \frac{1}{2} \lambda_1 (\sum_j \|d_j\|_2^2 + \sum_t \|d_t\|_2^2 + \sum_m \|v_m\|_2^2) + \\ \quad \lambda_2 \left(\frac{1}{2} (1 - \alpha) \sum_i \|s_i\|_2^2 + \alpha \sum_i |s_i|_1 \right), \\ \text{subject to} \quad \sum_m g_{mk}^2 \leq c, \forall k = 1, \dots, K_2. \end{array} \right. \quad (3)$$

Correct equation (3)

$$\left\{ \begin{array}{l} \mathcal{L}(d, p, v, s, g) = \frac{1}{2} \sum_{i,m} (z_{i,m} - d_j^\top v_m - p_t^\top v_m - s_i^\top g_m)^2 + \\ \quad \frac{1}{2} \lambda_1 (\sum_j \|d_j\|_2^2 + \sum_t \|d_t\|_2^2 + \sum_m \|v_m\|_2^2) + \\ \quad \lambda_2 \left(\frac{1}{2} (1 - \alpha) \sum_i \|s_i\|_2^2 + \alpha \sum_i |s_i|_1 \right), \\ \text{subject to} \quad \sum_m g_{mk}^2 \leq c, \forall k = 1, \dots, K_2. \end{array} \right. \quad (3)$$



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Incorrect equation (4)

$$\begin{cases} \mathcal{L}(D, P, V, S, G) = \frac{1}{2} \|Z - (X^D D + X^P P)V - SG\|_F^2 + \\ \quad \frac{1}{2} \lambda_1 (\|D\|_F^2 + \|P\|_F^2 + \|V\|_F^2) + \\ \quad \lambda_2 \left[\frac{1}{2} (1 - \alpha) \|S\|_F^2 + \alpha \|S\|_1 \right] \\ \text{subject to} \quad \|G_k\|_2^2 \leq c, \forall k = 1, \dots, K_2, \end{cases} \quad (4)$$

Correct equation (4)

$$\begin{cases} \mathcal{L}(D, P, V, S, G) = \frac{1}{2} \|Z - (X^D D + X^P P)V - SG\|_F^2 + \\ \quad \frac{1}{2} \lambda_1 (\|D\|_F^2 + \|P\|_F^2 + \|V\|_F^2) + \\ \quad \lambda_2 \left[\frac{1}{2} (1 - \alpha) \|S\|_F^2 + \alpha \|S\|_1 \right] \\ \text{subject to} \quad \|G_k\|_2^2 \leq c, \forall k = 1, \dots, K_2, \end{cases} \quad (4)$$

Incorrect equation (10)

$$\begin{cases} \mathcal{L}(V, G) = \frac{1}{2k} \sum_{j=1}^k \|Z_{I_j} - (X_{I_j}^D D_{I_j} + X_{I_j}^P P_{I_j})V - S_{I_j} G\|_F^2 + \\ \quad \frac{1}{2} \lambda_1 \left[\frac{1}{k} \sum_{j=1}^k (\|D_{I_j}\|_F^2 + \|P_{I_j}\|_F^2) + \|V\|_F^2 \right] + \\ \quad \frac{1}{k} \sum_{j=1}^k \lambda_2 \left[\frac{1}{2} (1 - \alpha) \|S_{I_j}\|_F^2 + \alpha \|S_{I_j}\|_2 \right], \\ \text{subject to} \quad \|G_k\|_2^2 \leq c, \forall k = 1, \dots, K_2. \end{cases} \quad (10)$$

Correct equation (10)

$$\begin{cases} \mathcal{L}(V, G) = \frac{1}{2k} \sum_{j=1}^k \|Z_{I_j} - (X_{I_j}^D D_{I_j} + X_{I_j}^P P_{I_j})V - S_{I_j} G\|_F^2 + \\ \quad \frac{1}{2} \lambda_1 \left[\frac{1}{k} \sum_{j=1}^k (\|D_{I_j}\|_F^2 + \|P_{I_j}\|_F^2) + \|V\|_F^2 \right] + \\ \quad \frac{1}{k} \sum_{j=1}^k \lambda_2 \left[\frac{1}{2} (1 - \alpha) \|S_{I_j}\|_F^2 + \alpha \|S_{I_j}\|_2 \right], \\ \text{subject to} \quad \|G_k\|_2^2 \leq c, \forall k = 1, \dots, K_2. \end{cases} \quad (10)$$

Incorrect Algorithm 1

$$\begin{cases} \ll A_k \leftarrow A_{k-1} - \left(X_{I_k}^D D'_k + X_{I_k}^P P'_k \right)^\top \left(X_{I_k}^D D'_k + X_{I_k}^P P'_k \right) \\ B_k \leftarrow B_{k-1} - \tilde{Z}'^\top \left(X_{I_k}^D D'_k + X_{I_k}^P P'_k \right) \\ E_k \leftarrow E_{k-1} - S'_{I_k}{}^\top S'_{I_k} \\ F_k \leftarrow F_{k-1} - Z'_{I_k}{}^\top S'_{I_k}. \end{cases}$$

Correct Algorithm 1

$$\begin{cases} A_k \leftarrow A_{k-1} - \left(X_{I_k}^D D'_k + X_{I_k}^P P'_k \right)^\top \left(X_{I_k}^D D'_k + X_{I_k}^P P'_k \right) \\ B_k \leftarrow B_{k-1} - \tilde{Z}'^\top \left(X_{I_k}^D D'_k + X_{I_k}^P P'_k \right) \\ E_k \leftarrow E_{k-1} - S'_{I_k}{}^\top S'_{I_k} \\ F_k \leftarrow F_{k-1} - Z'_{I_k}{}^\top S'_{I_k}. \end{cases}$$

The original article [1] is corrected.

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