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 "*ll*" was typeset at the start of the equations.

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

Incorrect equation (3)

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

Correct equation (3)

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

Incorrect equation (4)

$$
\begin{cases}
ll\mathcal{L}(D, P, V, S, G) = \frac{1}{2}\left\|Z - \left(X^D D + X^P P\right)V - SG\right\|_F^2 + \\
\qquad\qquad\qquad\quad \frac{1}{2}\lambda_1\left(\|D\|_F^2 + \|P\|_F^2 + \|V\|_F^2\right) + \\
\qquad\qquad\qquad\quad \lambda_2\left[\frac{1}{2}(1-\alpha)\|S\|_F^2 + \alpha\|S\|_1\right] \\
\text{subject to} \qquad \|G_2\|_2^2 \leq c, \forall k = 1, \ldots, K_2,
\end{cases}
\tag{4}
$$

Correct equation (4)

$$
\begin{cases}
\mathcal{L}(D, P, V, S, G) = \frac{1}{2}\left\|Z - \left(X^D D + X^P P\right)V - SG\right\|_F^2 + \\
\qquad\qquad\qquad\quad \frac{1}{2}\lambda_1\left(\|D\|_F^2 + \|P\|_F^2 + \|V\|_F^2\right) + \\
\qquad\qquad\qquad\quad \lambda_2\left[\frac{1}{2}(1-\alpha)\|S\|_F^2 + \alpha\|S\|_1\right] \\
\text{subject to} \qquad \|G_2\|_2^2 \leq c, \forall k = 1, \ldots, K_2,
\end{cases}
\tag{4}
$$

Incorrect equation (10)

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

Correct equation (10)

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

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Incorrect Algorithm 1

$$
\begin{cases}
llA_k \leftarrow A_{k-1} - \left(X_{I_k}^D D'_k + X_{I_k}^P P'_k \right)^{\mathsf{T}} \left(X_{I_k}^D D'_k + X_{I_k}^P P'_k \right) \\
B_k \leftarrow\ B_{k-1} - \tilde{Z}'^{\mathsf{T}}_{I_k} \left(X_{I_k}^D D'_k + X_{I_k}^P P'_k \right) \\
E_k \leftarrow\ E_{k-1} - S'^{\mathsf{T}}_{I_k} S'_{I_k} \\
F_k \leftarrow\ F_{k-1} - Z'^{\mathsf{T}}_{I_k} S'_{I_k}.
\end{cases}
$$

Correct Algorithm 1

$$
\begin{cases}
A_k \leftarrow A_{k-1} - \left(X_{I_k}^D D'_k + X_{I_k}^P P'_k \right)^{\mathsf{T}} \left(X_{I_k}^D D'_k + X_{I_k}^P P'_k \right) \\
B_k \leftarrow B_{k-1} - \tilde{Z}'^{\mathsf{T}}_{I_k} \left(X_{I_k}^D D'_k + X_{I_k}^P P'_k \right) \\
E_k \leftarrow E_{k-1} - S'^{\mathsf{T}}_{I_k} S'_{I_k} \\
F_k \leftarrow F_{k-1} - Z'^{\mathsf{T}}_{I_k} S'_{I_k}.
\end{cases}
$$

The original article [1] is corrected.

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Reference

1. Zhao K, So HC, Lin Z. scParser: sparse representation learning for scalable single-cell RNA sequencing data analysis. Genome Biol. 2024;25:223. https://doi.org/10.1186/s13059-024-03345-0.