Corrigendum

Corrigendum to “Polychromatic Iterative Statistical Material Image Reconstruction for Photon-Counting Computed Tomography”

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In the article titled “Polychromatic Iterative Statistical Material Image Reconstruction for Photon-Counting Computed Tomography” [1], there were errors in equations (13) and (28) in addition to some errors in the text. This should be corrected as follows:

(1) Equation (13) should be corrected to

\[
\tilde{\beta}_i^{b(n)}(E) = \frac{N_{i}^{b,(n)}(f^{(n)})}{t_i(E, f^{(n)})}. \tag{13}
\]

(2) The text between equations (14) and (15) should be corrected to

\[
N_i^b(f) = \int \frac{N_{i,0}^{b}(E)}{\beta_i^{b,(n)}(E, f^{(n)})} t_i(E, f_i^{(n)}) \beta_i^{b(n)}(E, f^{(n)}) \, dE. \tag{14}
\]

Since \( h_i^b \) is a convex function, it holds that

\[
\int \frac{N_{i,0}^{b}(E)}{\beta_i^{b,(n)}(E, f^{(n)})} \, dE = 1. \tag{15}
\]

(3) Equation (28) should be corrected to

\[
\frac{\partial^2 Q_3}{\partial f_k^j \partial f_m^j} = \sum_{b=1}^{n} \sum_{i=1}^{N_b} \int \frac{N_i^{b,(n)}(E)}{\beta_i^{b,(n)}(E, f^{(n)})} \frac{\partial^2 N_i^{b,(n)}(E)}{\partial f_k^j} \frac{\partial \mu_k(E) \mu_m(E)}{\partial f_j^k} \, dE.
\]

Since \( h_i^b \) is a convex function, it holds that

\[
\int \frac{N_{i,0}^{b}(E)}{\beta_i^{b,(n)}(E, f^{(n)})} \, dE = 1.
\]

(4) In the “Summary of the Algorithm” subsection, step 3 should be corrected to

(3) Additionally, calculate

\[
\int N_{i,0}^{b}(E) \frac{\partial \mu_k(E) \mu_m(E)}{\partial f_j^k} \, dE,
\]

which equates to \(-(1/a_{ij})(\partial N_i^{b,(n)}/\partial f_j^k)\).

References

[1] T. Weidinger, T. M. Buzug, T. Flohr, S. Kappler, and K. Stierstorfer, “Polychromatic iterative statistical material image reconstruction for photon-counting computed tomography,” International Journal of Biomedical Imaging, vol. 2016, Article ID 5871604, 15 pages, 2016.