



**CORRECTION**

## Correction: Learning-Based Metaheuristic Approach for Home Healthcare Optimization Problem

Mariem Belhor<sup>1,2,3</sup>, Adnen El-Amraoui<sup>1,\*</sup>, Abderrazak Jemai<sup>2</sup> and François Delmotte<sup>1</sup>

<sup>1</sup>Univ. Artois, LGI2A Laboratory, UR 3926, Technoparc FUTURA 62400, Béthune, France

<sup>2</sup>Univ. Carthage, SERCOM Laboratory, EPT, Marsa, 2078, Tunisia

<sup>3</sup>Univ. Manouba, National School of Computer Science, Manouba, 2010, Tunisia

\*Corresponding Author: Adnen El-Amraoui. Emails: adnen.elamraoui@univ-artois.fr, elamraoui.adnen@gmail.com

Published: 26 January 2024

In the article “Learning-Based Metaheuristic Approach for Home Healthcare Optimization Problem” by Mariem Belhor, Adnen El-Amraoui, Abderrazak Jemai and Francois Delmotte (*Computer Systems Science & Engineering*, 2023, Vol. 45, No. 1, pp. 1–19. doi: [10.32604/csse.2023.029058](https://doi.org/10.32604/csse.2023.029058)), there was an error in the original formulation of the constraint.

The authors sincerely apologize for any confusion caused by this error. The authors have corrected the formulation, and please find below the corrected information:

### Clarification on Section 3.2 Mathematical Formulation

The original Constraint (4) was intended to ensure that each patient is assigned to only one caregiver during the planning horizon, and each caregiver crosses a path exactly once over the horizon. Unfortunately, this constraint was incorrectly represented, specifically in the summation term and value assignment, where the depot node (represented by 0) was mistakenly included, contrary to the authors’ intention. The corrected Constraint (4’) should be stated as follows:

$$\sum_{j=1}^n \sum_{c=1}^m \sum_{t=1}^T X_{ijct} = 1, \quad \forall i = 1, \dots, n \quad (4')$$

To enhance the clarity and accuracy of our model, we propose to refine the subtour elimination constraint by introducing non-negative flow variables  $f_{ijct}$ , depicting the visit sequence of caregivers. The initial constraint, originally presented as Eq. (7), is now replaced with the following two equations:

$$f_{ijct} \leq (|P| - 1) \cdot X_{ijct} \quad \forall i, j \in P, i \neq j, \forall c \in C, \forall t \in T \quad (7'-a)$$

$$f_{ijct} \geq f_{kict} + 1 - (|P| - 1) \cdot (1 - X_{ijct}) \quad \forall k, i, j \in P, k \neq i, i \neq j, \forall c \in C, \forall t \in T \quad (7'-b)$$

It is important to highlight that the results and performance of the proposed algorithms GAmTSP and its hybrid learning version LGA-mTSP, are based on the correct interpretation of the model’s intent and they are therefore not impacted by these typographical errors, as the model was used for problem description rather than direct solution.



The authors state that the scientific conclusions are unaffected. This correction was approved by the *Computer Systems Science & Engineering* Editorial Office. The original publication has also been updated.