Correction to "High Resolution Beacon-Based Proximity Detection for Dense Deployment"

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THE authors of "High Resolution Beacon-Based Proximity Detection for Dense Deployment" which appeared in the June issue of this journal [1] would like to point out an error that occurred in their paper on page 4.

On page 4, the equation should be corrected as follows:

"Based on the resultant energy loss vector $\mathbf{E} \in \mathbb{R}^n$, we can identify the target PoI. The intuition here is that the RN should measure the highest energy from the target PoI, which means there is only a minimum energy loss for signals to travel from the target PoI to the RN. Hence, the proximity detection model can be formulated as follows:

$$\widehat{i} := \underset{i \in b_n}{argmin}\{E_i\}$$

where E_i is the energy required by the signal to travel from PoI_i to the RN. b_n is the reduced set of the PoI's indexes subject to the n number of PoIs observed during Ts, and $b_n \subseteq b$".

Similarly, on page 8, the Eq. (22) should be corrected as follows:

$$i_0 := \underset{i \in b_n}{argmin}\left\{E_{\mathbb{T}}{}^{(G)},\ E_{i_0}{}^{(G-1)}\right\}.$$

Algorithm 1 and 2 should be corrected as follows:

Algorithm 1. Adaptive Scanning (AS)

Input: $T_s = t, \max Iter = 100$
Output: Observed vectors, $\widetilde{\Phi}$ and $\widetilde{\mathrm{T}}$
Initialize: *count* = *size*($\widetilde{\Phi}$), *iter* = 1, *compare Ratio* = 0
while t $>=$ $\mathrm{T_s}$ **do**
  if iter > 2 **then**
    Compare $\widetilde{\Phi}^{(iter-1)}$ and $\widetilde{\mathrm{T}}^{(iter-1)}$
      with $\widetilde{\Phi}^{(iter-1)}$ and $\widetilde{\mathrm{T}}^{(iter-1)}$
      and update the $\widetilde{\Phi}$ and $\widetilde{\mathrm{T}}$
      Set $compareRatio = \frac{size(\widetilde{\Phi}^{(iter-1)})}{size(\widetilde{\Phi}^{(iter)})}$
    else if *iter* > 1 **then**
    Store and average:
    - the instantaneous $\mathrm{P_{r,d,Bm}}$ into $\widetilde{\Phi}^{(iter)}$
    - the inter-arrival time into $\widetilde{\mathrm{T}}^{(iter)}$
  else if *iter* $== 1$ **then**
    Store and average:
    - the instantaneous $P_{r,d,Bm}$ into $\widetilde{\Phi}$
    - the inter-arrival time into $\widetilde{\mathrm{T}}$
  Increase *iter* by 1
  if *count* ≥ 3 *or compareRatio* $== 1$ *or iter* $>$ *maxiter* **then**
    Forward the current Φ and T to the sDE function
      BREAK and exit the **WHILE** loop
  end
end

Algorithm 2. Spontaneous Differential Evolution (sDE)

Input: Observed vectors, $\widetilde{\Phi}$ and $\widetilde{\mathrm{T}}$, $\mathrm{maxG} = 100$
Output: Detection output, $\mathrm{i_0}$
Initialize: *population* = *size*($\widetilde{\Phi}$), $G = 1, M = 0.8, C = 0.5$
while $G <$ *maxG* **do**
  if $\mathrm{G} > 1$ **then**
    Select the top two elements Calculate the turning
    parameter using Eq. (23)
  else
    Select the top three elements Set $\mathrm{S} = 1$
  end
  Forward the turning parameter to AS
  Perform:
  - mutation using Eq. (17) and (18)
  - crossover using Eq. (19)
  - selection using Eq. (22)
  if $G > 2$ **then**
    if $i_0{}^{(G-2)} == i_0{}^{(G-1)} == i_0{}^{(G)}$ *or* $G >$ *maxG* **then**
      Set $\hat{\mathrm{i}} = \mathrm{i_0}$
        BREAK and exit the **WHILE** loop
    end
  end
  Increase G by 1
end

REFERENCES

[1] P. C. Ng, J. She, and S. Park, "High resolution beacon-based proximity detection for dense deployment, " *IEEE Trans. Mobile Comput.*, vol. 17, no. 6, pp. 1369–1382, Jun. 2018.

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Manuscript received 22 Nov. 2016; revised 7 Sept. 2017; accepted 2 Oct. 2017. For information on obtaining reprints of this article, please send e-mail to: reprints@ieee.org, and reference the Digital Object Identifier below.
Digital Object Identifier no. 10.1109/TMC.2018.2858518