# Erratum to: Reversible watermarking for 2D vector maps based on normalized vertices 

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## Erratum to: Multimed Tools Appl <br> DOI: 10.1007/s11042-016-3970-5

The author regrets that the original version of this article contain four errors. The author did not consider the first vertex and the last vertex of each polygon/polyline during the experiments, the results of proposed method in Table 2, the last column of Tables 7 and 8, and Fig. 5 was wrong. The author, therefore, has corrected errors as follows.

The author would like to apologize for any inconvenience caused.

1. The Maxd and $d$ values of the proposed method in Table 2

Table 2 The Maxd and $d$ values between the original vector maps and the recovered ones

| Vector maps | Maxd $(\mathrm{m})$ | $d(\mathrm{~m})$ |
| :--- | :--- | :--- |
| M1 | $3.5624 \times 10^{-6}$ | $1.9036 \times 10^{-6}$ |
| M2 | $1.7858 \times 10^{-6}$ | $9.5164 \times 10^{-7}$ |
| M3 | $4.5061 \times 10^{-6}$ | $2.4517 \times 10^{-6}$ |
| M4 | $4.4588 \times 10^{-6}$ | $2.4343 \times 10^{-6}$ |
| Average of 50 vector maps | $3.9563 \times 10^{-6}$ | $1.6598 \times 10^{-6}$ |

The online version of the original article can be found at http://dx/doi.org/10.1007/s11042-016-3970-5

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2. The $d$ values the proposed method in Table 7

Table 7 Invisibility of different methods (m)

| Vector maps | Cao et al. [22] | Wang et al. [23] | Wang et al. [24] | Peng et al. [38] | Xiao et al. [39] | Proposed |
| :--- | :---: | :---: | :---: | :---: | :---: | ---: |
| M1 | 0.3362 | 0.1342 | 0.1235 | $4.4039 \times 10^{-5}$ | 0.0174 | 0.1611 |
| M2 | 3.0849 | 0.6155 | 0.6266 | 0.0002 | 3.1594 | 0.8055 |
| M3 | 2.9274 | 1.3254 | 1.2464 | 0.0003 | 5.0636 | 1.6145 |
| M4 | 93.7668 | 26.1374 | 24.7573 | 0.0060 | 2.6848 | 31.6390 |

3. The capacity the proposed method in Table 8

Table 8 Capacity of different methods ( $b p v$ )

| Vector maps | Cao et al. <br> $[22]$ | Wang et al. <br> $[23]$ | Wang et al. <br> $[24]$ | Peng et al. <br> $[38]$ | Xiao et al. <br> $[39]$ | Proposed |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| M1 | 0.2395 | 1.9827 | 0.9993 | 0.9993 | 1.9991 | 3.9981 |
| M2 | 0.5737 | 1.8182 | 0.9999 | 0.9999 | 1.9998 | 3.9997 |
| M3 | 0.5347 | 1.9569 | 0.9892 | 0.9999 | 1.9998 | 3.9567 |
| M4 | 0.6061 | 1.9165 | 0.9758 | 0.9933 | 1.9987 | 3.9273 |
| Average of 50 <br> vector maps | 0.5210 | 1.8970 | 0.9927 | 0.9988 | 1.9996 | 3.9890 |

## 4. The Fig. 5

Fig. 5 Relationship between average embedding distortion $d$ and $b$


