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Corrections to “On Transmit–Diversity for Spatial Modulation MIMO: Impact of Spatial–Constellation Diagram and Shaping Filters at the Transmitter”

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Abstract

In this comment, we correct some typographical errors in a paper that has recently appeared in this Transactions [1].

Index Terms


I. INTRODUCTION

In [1], the authors have proposed a new unified space–time–coded transceiver for Multiple–Input–Multiple–Output (MIMO) systems that exploits the recently proposed concept of Spatial Modulation (SM). Furthermore, the authors have introduced a Maximum–Likelihood (ML–) optimum single–stream demodulator for the proposed transmission scheme. In the present comment, we correct some typographical errors in some equations in [1, Sec. VI].

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A. Corrections to Section VI

The correct expression of [1, Eq. (15)] is as follows:

\[
(\hat{\alpha}, \hat{\mu}_1, \hat{\mu}_2) = \arg\min_{\mathbf{a}^{(\alpha)} \in \mathcal{A}, \mathbf{\mu}_1 \in \mathcal{M}, \mu_2 \in \mathcal{M}} \{ \Lambda_1(\hat{\alpha}, \hat{\mu}_1) + \Lambda_2(\hat{\alpha}, \hat{\mu}_2) \}
\]

\[
\begin{align}
\text{(1)} & \Rightarrow \\
& \arg\min_{\mathbf{a}^{(\alpha)} \in \mathcal{A}} \{ \min_{\mu_1 \in \mathcal{M}} \{ \Lambda_1(\hat{\alpha}, \hat{\mu}_1) \} + \min_{\mu_2 \in \mathcal{M}} \{ \Lambda_2(\hat{\alpha}, \hat{\mu}_2) \} \} \rightarrow \hat{\alpha} \\
& \arg\min_{\mu_1 \in \mathcal{M}} \{ \Lambda_1(\hat{\alpha}, \hat{\mu}_1) \} \rightarrow \hat{\mu}_1 \\
& \arg\min_{\mu_2 \in \mathcal{M}} \{ \Lambda_2(\hat{\alpha}, \hat{\mu}_2) \} \rightarrow \hat{\mu}_2
\end{align}
\]

\[
\begin{align}
\text{(2)} & \Rightarrow \\
& \arg\min_{\mathbf{a}^{(\alpha)} \in \mathcal{A}} \{ \min_{\mu_1 \in \mathcal{M}} \{ \Lambda_1(\hat{\alpha}, \hat{\mu}_1) \} + \min_{\mu_2 \in \mathcal{M}} \{ \Lambda_2(\hat{\alpha}, \hat{\mu}_2) \} \} \rightarrow \hat{\alpha} \\
& \arg\min_{\mu_1 \in \mathcal{M}} \{ \Lambda_1(\hat{\alpha}, \hat{\mu}_1) \} \rightarrow \hat{\mu}_1 \\
& \arg\min_{\mu_2 \in \mathcal{M}} \{ \Lambda_2(\hat{\alpha}, \hat{\mu}_2) \} \rightarrow \hat{\mu}_2
\end{align}
\]

where (1) and (2) are described in [1]. The mistakes originated from typing \( \arg\min \{ \cdot \} \) instead of \( \min \{ \cdot \} \).

The correct expression of [1, Eq. (17)] is as follows:

\[
\hat{\alpha} = \arg\min_{\mathbf{a}^{(\alpha)} \in \mathcal{A}} \{ \Lambda_1(\hat{\alpha}, \hat{\mu}_1(\hat{\alpha})) + \Lambda_2(\hat{\alpha}, \hat{\mu}_2(\hat{\alpha})) \}
\]

(2)

The mistakes originated from typing \( \hat{\mu}_i(\hat{\alpha}) \) instead of \( \Lambda_i(\hat{\alpha}, \hat{\mu}_i(\hat{\alpha})) \) for \( i = 1, 2 \).

The correct expression of [1, Eq. (19)] is as follows:

\[
\begin{align}
\hat{\mu}_m(\hat{\alpha}) \bigg|_{m=1,2,\ldots,N_M} &= \arg\min_{\mu_m \in \mathcal{M}} \left\{ \Lambda_m(\hat{\alpha}, \hat{\mu}_m) = \sum_{r=1}^{N_S} \left[ (E_S/2) \left( \sum_{r=1}^{N_S} |H_{r,1}|^2 \right) |\hat{\mu}_m|^2 - 2 \sqrt{E_S/2} \text{Re} \left( \psi^{(H)}_{m,s}(t, \tilde{t}, r) \hat{\mu}_m^* \right) \right] \right\} \\
\hat{\alpha} &= \arg\min_{\mathbf{a}^{(\alpha)} \in \mathcal{A}} \left\{ \sum_{m=1}^{N_M} \Lambda_m(\hat{\alpha}, \hat{\mu}_m(\hat{\alpha})) \right\} \\
\hat{\mu}_m \bigg|_{m=1,2,\ldots,N_M} &= \hat{\mu}_m(\hat{\alpha}) \bigg|_{m=1,2,\ldots,N_M}
\end{align}
\]

(3)

which follows from the correct expression in (2).

II. CONCLUSION

In this comment, some typographical errors in [1] have been corrected. It is worth emphasizing that the numerical results in [1] are obtained by using the correct equations in (1)–(3).

REFERENCES