

Correction to

“On the Cost and Benefit of Cooperation (Extended Version)”

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This document corrects two errors in [1].

- On page 2/15, in the statement of Theorem 1, the condition

$$\max_{P(x_1, x_2)} I(X_1, X_2; Y) > \max_{P(x_1)P(x_2)} I(X_1, X_2; Y), \quad (1)$$

is not sufficient to prove that $G'(0) = \infty$. In addition to (1), a condition on the support of the maximizing distributions is required. Details are provided in [2]. The support condition guarantees that the equation

$$\left. \frac{d}{d\lambda} I_\lambda(X_1; X_2) \right|_{\lambda=0^+} = 0,$$

in Lemma 7, on page 8/15, holds.

- The proof given in Appendix F for the mutual covering lemma for weakly typical sets is incorrect. See [2] for a correct proof. Specifically, the equality

$$\begin{aligned} & \mathbf{P}\left\{\forall (a, b) \in \mathcal{A} \times \mathcal{B}: (U^n, V_1^n(a), V_2^n(b)) \notin A_\delta^{(n)}\right\} \\ &= \sum_{u^n} P(u^n) \left[1 - \sum_{v_1^n, v_2^n} K(u^n, v_1^n, v_2^n) P(v_1^n | u^n) P(v_2^n | u^n)\right]^{|\mathcal{A}||\mathcal{B}|}, \end{aligned}$$

on the left column of page 14/15 does not necessarily hold.

REFERENCES

- [1] P. Noorzad, M. Effros, and M. Langberg, “On the Cost and Benefit of Cooperation (Extended Version),” *ArXiv e-prints*, 2015. [Online]. Available: <https://arxiv.org/abs/1504.04432>
- [2] —, “The Unbounded Benefit of Encoder Cooperation for the k -user MAC,” *ArXiv e-prints*, Sep. 2016. [Online]. Available: <https://arxiv.org/abs/1601.06113>