ERRATUM about the paper: "L^p and almost sure rates of convergence of averaged stochastic gradient algorithms: locally strongly convex objective"

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There is a mistake in Theorem 4.2 in Godichon-Baggioni (2019). This theorem should be written as follows:

Theorem 4.2. *Suppose Assumptions **(A1)** to **(A5a)** hold. Suppose also that there are $\eta > \frac{1}{\alpha} - 1$ and C_η such that for all $h \in H$,*

$$\mathbb{E}\left[\|\nabla_h g(X,h)\|^{2+2\eta}\right] \leq C_\eta \left(1 + \|h-m\|^{2+2\eta}\right). \tag{1}$$

Then

$$\|Z_n - m\|^2 = O\left(\frac{\ln n}{n^\alpha}\right) \quad a.s.$$

Furthermore, for all $\delta > 0$,

$$\left\|\overline{Z}_n - m\right\|^2 = o\left(\frac{(\ln n)^{1+\delta}}{n}\right) \quad a.s.$$

Remark that condition (1) is verified since Assumption **(A5b)** or **(A5b')** hold. This error come from the fact that there is a mistake in the proof. More precisely, Lemma 6.1 which should be written as folllows:

Lemma 6.1. *Suppose Assumptions **(A1)** to **(A3)** and **(A5a)** hold. Suppose also that there are $\eta > \frac{1}{\alpha} - 1$ and C_η such that for all $h \in H$,*

$$\mathbb{E}\left[\|\nabla_h g(X,h)\|^{2+2\eta}\right] \leq C_\eta \left(1 + \|h-m\|^{2+2\eta}\right).$$

Then

$$\|\beta_{n-1} M_n\|^2 = O\left(\frac{\ln n}{n^\alpha}\right) \quad a.s.$$

The proof of this lemma is given in Cénac et. al (2020) (see Theorem 6.1).

References

Cénac, Peggy and Godichon-Baggioni, Antoine and Portier, Bruno (2020) An efficient Averaged Stochastic Gauss-Newton algorithm for estimating parameters of non linear regressions models arXiv preprint arXiv:2006.12920,

Godichon-Baggioni, Antoine, (2019) Lp and almost sure rates of convergence of averaged stochastic gradient algorithms: locally strongly convex objective *ESAIM: PS*, pp 841-873.