Errata for "Parameter Estimation: Towards Data-Driven and Privacy Preserving Approaches"

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- In page 11, $1_A\{\cdot\}$ should be changed to $1\{A\}$.
- Assumption 5.6 on page 44 should be modified as "$F(\cdot;\theta)$ has connected support and $F^{-1}(\cdot;\theta)$ is a differentiable function for each $\theta \in \Theta$".
- In page 47, the text starting from $\mathbb{P}(y^{(\theta)}_{(\lfloor \gamma N \rfloor)} - q^{(\theta)}(\gamma) > \varepsilon)$ until the end of the proof should be modified as follows:

$$
\begin{aligned}
\text{``}\,&\mathbb{P}(y^{(\theta)}_{(\lfloor \gamma N \rfloor)} - q^{(\theta)}(\gamma) > \varepsilon) \\
&\overset{(c)}{=} \mathbb{P}\bigg(\frac{1}{N}\sum_{n=1}^{N} 1\{y_n^{(\theta)} \geq q^{(\theta)}(\gamma) + \varepsilon\} \geq 1 - \frac{\lfloor \gamma N \rfloor}{N} + \frac{1}{N}\bigg) \\
&\leq \mathbb{P}\bigg(\frac{1}{N}\sum_{n=1}^{N} 1\{y_n^{(\theta)} \geq q^{(\theta)}(\gamma) + \varepsilon\} \geq 1 - \frac{\lfloor \gamma N \rfloor}{N}\bigg) \\
&= \mathbb{P}\bigg(\frac{1}{N}\sum_{n=1}^{N} (1\{y_n^{(\theta)} \geq q^{(\theta)}(\gamma) + \varepsilon\} - \mathbb{E}[1\{y_n^{(\theta)} \geq q^{(\theta)}(\gamma) + \varepsilon\}]) \\
&\qquad \geq 1 - \frac{\lfloor \gamma N \rfloor}{N} - \mathbb{E}[\mathbb{1}\{y_n^{(\theta)} \geq q^{(\theta)}(\gamma) + \varepsilon\}]\bigg) \\
&\overset{(d)}{\leq} \exp\bigg(- 2N\bigg(F(q^{(\theta)}(\gamma) + \varepsilon;\theta) - \frac{\lfloor \gamma N \rfloor}{N}\bigg)^2\bigg) \\
&\overset{(e)}{\leq} \exp\left[-2N\left(F(q^{(\theta)}(\gamma) + \varepsilon;\theta) - \gamma\right)^2\right],
\end{aligned}
$$

where (c) follows from (5.8), (d) follows from Hoeffding's inequality [37], and (e) follows from the inequality $\lfloor \gamma N \rfloor < \gamma N$. Note that $F(q^{(\theta)}(\gamma) + \varepsilon;\theta) - \gamma > 0$ due to Assumption 5.6, according to which $F(\cdot;\theta)$ has connected support.

Similarly, $\mathbb{P}(y^{(\theta)}_{(\lfloor \gamma N \rfloor)} - q^{(\theta)}(\gamma) < -\varepsilon) < \exp[-2N(F(q^{(\theta)}(\gamma) + \varepsilon;\theta) - \gamma)^2]$ by applying Hoeffding's inequality in the opposite direction. Combining this with (5.7), we see that $\mathbb{P}(A^c_{m,\varepsilon}) \to 0$ as $m \to \infty$, which means that $\mathbb{P}(A_{m,\varepsilon}) \to 1$."

- In page 59, L_f and L_r should be changed to l_f and l_r, respectively, in (6.7).
- In line 90 of page 60, Θ should be changed to $\boldsymbol{\theta}$.