Let the samples

\begin{align*}
\text{Assumption 2} &
\end{align*}

The entire transcript \( Z \): The entire transcript \( Z \)

\begin{align*}
\text{Lower bounds for estimation under local differential privacy constraints.}
\end{align*}

\begin{align*}
\text{Local Privacy Definitions}
\end{align*}

\begin{align*}
\text{Fully Interactive Privacy Schemes}
\end{align*}

\begin{align*}
\text{Minimax Risk}
\end{align*}

\begin{align*}
\text{Main Results}
\end{align*}

\begin{align*}
\text{Achievability and Analysis}
\end{align*}

\begin{align*}
\text{Extensions}
\end{align*}

\begin{align*}
\text{Acknowledgements}
\end{align*}

\begin{align*}
\text{References}
\end{align*}

\begin{align*}
\text{Goal}
\end{align*}

\begin{align*}
\text{Bernoulli Estimation: Let } \mathcal{P}_a \text{ be the collection of Bernoulli distributions on } \{0, 1\}^d \text{ and } L(\theta, \theta') = \sum_{j=1}^d (\theta_j - \theta'_j) \text{ for } \varepsilon \text{ symmetric then }
\end{align*}

\begin{align*}
\text{Logistic Risk: Let } \mathcal{P}_b \text{ be the collection of logistic distributions with } 
\ell(\theta; x, y) = \log \left( 1 + e^{-\gamma(x \cdot \theta)} \right), \quad R_\varepsilon(\theta) = E_{(X, Y)}[\ell(\theta; X, Y)], \quad \text{and excess risk } 
\end{align*}

\begin{align*}
\text{Gaussian Estimation (only for Assumption 1): Let } \mathcal{P}_a \text{ be the collection of Gaussians } N(\theta, \sigma^2 I_2^d) \text{ and } \theta \in [-1, 1]^d \text{ and } \sigma > 0 \text{ is known, then }
\end{align*}

\begin{align*}
\text{k-sparse Gaussian Estimation (only for Assumption 1): Let } \mathcal{P}_b \text{ be the collection of k-sparse Gaussians } N(\theta, \sigma^2 I_k^d) \text{ and } \theta \in [-1, 1]^k \text{ and } \sigma > 0 \text{ is known, then }
\end{align*}

\begin{align*}
\text{Take Home: Effective sample size reduction from } n \text{ to } n \cdot \min\left\{ \varepsilon, c^2, d \right\}/d
\end{align*}

\begin{align*}
\text{References}
\end{align*}

\begin{align*}
\end{align*}

\begin{align*}
\text{Braverman, Ankit Garg, Tengyu Ma, Huy L. Nguyen, and David P. Woodruff. Communication lower bounds for statistical estimation problems via a distributed data processing inequality. 2016.}
\end{align*}

\begin{align*}
\text{Ankit Garg, Tengyu Ma, and Huy L. Nguyen. On communication cost of distributed statistical estimation and dimensionality. 2014.}
\end{align*}

\begin{align*}
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