



Receiving the Top Certificate



$$\Pr[\text{Not receiving } i^*] = \prod_j \left( 1 - \frac{\mathbf{e}_{i^*}^{-1} x_{i^*}(j)^p}{\sum_i \mathbf{e}_i^{-1} x_i(j)^p} \right)^{O(s^{p-2} \cdot \log^3 n)}$$

$$\leq \exp \left( -s^{p-2} \log^3 n \sum_j \frac{\mathbf{e}_{i^*}^{-1} x_{i^*}(j)^p}{\sum_i \mathbf{e}_i^{-1} x_i(j)^p} \right)$$

$$\leq \exp \left( -s^{p-2} \log^3 n \cdot \frac{\mathbf{e}_{i^*}^{-1} (\sum_j x_{i^*}(j)^{p/2})^2}{\sum_j \sum_i \mathbf{e}_i^{-1} x_i(j)^p} \right)$$

$$(1-x \leq \exp(-x))$$

$$\left( \sum_i \frac{a_i}{b_i} \geq \frac{(\sum_i \sqrt{a_i})^2}{\sum_i b_i} \right)$$



# Receiving the Top Coordinate

$$\begin{aligned}
 \Pr[\text{Not receiving } i^*] &= \prod_j \left( 1 - \frac{\mathbf{e}_{i^*}^{-1} x_{i^*}(j)^p}{\sum_i \mathbf{e}_i^{-1} x_i(j)^p} \right)^{O(s^{p-2} \cdot \log^3 n)} \\
 &\leq \exp \left( -s^{p-2} \log^3 n \sum_j \frac{\mathbf{e}_{i^*}^{-1} x_{i^*}(j)^p}{\sum_i \mathbf{e}_i^{-1} x_i(j)^p} \right) \quad (1 - x \leq \exp(-x)) \\
 &\leq \exp \left( -s^{p-2} \log^3 n \cdot \frac{\mathbf{e}_{i^*}^{-1} (\sum_j x_{i^*}(j)^{p/2})^2}{\sum_j \sum_i \mathbf{e}_i^{-1} x_i(j)^p} \right) \left( \sum_i \frac{a_i}{b_i} \geq \frac{(\sum_i \sqrt{a_i})^2}{\sum_i b_i} \right)
 \end{aligned}$$

# Receiving the Top Coordinate (Contd.)

$$\leq \exp \left( -s^{p-2} \log^3 n \cdot \frac{\mathbf{e}_{i^*}^{-1} (\sum_j x_{i^*}(j)^{p/2})^2}{\sum_j \sum_i \mathbf{e}_i^{-1} x_i(j)^p} \right)$$