

Pointwise Approaches

- Regression based

$$1 - NDCG(f) \leq \frac{1}{Z_m} \left(2 \sum_{j=1}^m \eta_j^\varepsilon \right)^{1/\alpha} \left(\sum_{j=1}^m (f(x_j) - y_j)^\beta \right)^{1/\beta}$$

Discount coefficients
in DCG

Regression loss

- Classification based

$$1 - NDCG(f) \leq \frac{15}{Z_m} \sqrt{2 \left(\sum_{j=1}^m \eta_j^2 - m \prod_{j=1}^m \eta_j^{\frac{2}{m}} \right) \cdot \sum_{j=1}^m I_{\{y_j \neq f(x_j)\}}}$$

Discount coefficients
in DCG

Classification loss