Traditional Notion of Relevance

Relevance constraints
[Fang et al. 04]

Relevance

Div. from Randomness
(Amati & Rijsbergen 02)

$\Delta(\text{Rep}(q), \text{Rep}(d))$
Similarity

$P(r=1|q,d)$ $r \in \{0,1\}$
Probability of Relevance

$P(d \rightarrow q)$ or $P(q \rightarrow d)$
Probabilistic inference

Different rep & similarity

Regression Model (Fuhr 89)

Generative Model

Different inference system

Learn. To Rank
(Joachims 02, Berges et al. 05)

Doc generation

Query generation

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Vector space model
(Salton et al., 75)

Prob. distr. model
(Wong & Yao, 89)

Classical prob. Model
(Robertson & Sparck Jones, 76)

LM approach
(Ponte & Croft, 98)
(Lafferty & Zhai, 01a)

Prob. concept space model
(Wong & Yao, 95)

Inference network model
(Turtle & Croft, 91)