

# 一种新型最优检索结果的发现与论证

洪宇 康杨杨 姚建民 朱巧明 周国栋  
(215006)

摘要: 基于大规模数据, 本文尝试证明原本正确的检索结果(即, 内容符合客观逻辑和自然规律)是最优的。基于此, 我们提出一种基于正确性的信息检索评价度量。本文的正确性是一种客观事实, 不会随着用户的主观认知而改变。它与相关性检索结果所依赖的用户满意度不同。直到最近, 还没有关于原始正确性检测和应用的检索领域研究, 也没有提出对应的优化检索结果排名的方法。本文通过定量证据, 进一步提出一种合理的评价框架。

关键词: ; ; ;  
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## Discovery and Illustration of Novel Optimal Retrieval Result

HONG Yu KANG Yang-Yang YAO Jian-Min ZHU Qiao-Ming ZHOU Guo-Dong  
(School of Computer Science and Technology, Soochow University, Suzhou, Jiangsu 215006)

**Abstract** Based on the large-scale data, in this paper we attempt to prove that originally correct search results (viz., the results whose content obey objective logic and nature laws) is optimal. Relying on this, we propose a new correctness based evaluation metric for information retrieval. The correctness in this paper is a kind of factual and objective truth which never changes with subjective cognition of users. It is very different from relevant search results which rely on the satisfactoriness of users. Until recently, there hasn't been related research on the original correctness detection and application in the field of information retrieval, and also the corresponding method for optimizing search result ranking has never been proposed. This paper focuses on illustrating the issue with quantitative evidences, and further offering a reasonable evaluation framework.

**Keywords** information retrieval; satisfaction; correct retrieval results; evaluation metric

## 1 引言

[2-3],  
,  
,  
(query) . (“ ”)  
[1], . “ ”

:2012-06-27; :2012-11-08. (61003152, 61272259, 60970056, 60970057, 90920004)、 (2009321110006, 20103201110021)、 (BK2011282)、 (11KJ520003) (SYG201030) .洪宇, 1978 , , . E-mail: hongy@sdua.edu.cn.康杨杨, 1989 , , .姚建民, 1971 , , .朱巧明, 1963 , , .周国栋( ), 1968 , , (CCF) , . E-mail: gdzhou@suda.edu.cn.



4

### 3 视觉游戏



1 “ ” 1

“ ”

(

)

“ ” 1 1

“ ” 2

: ( “ ”)

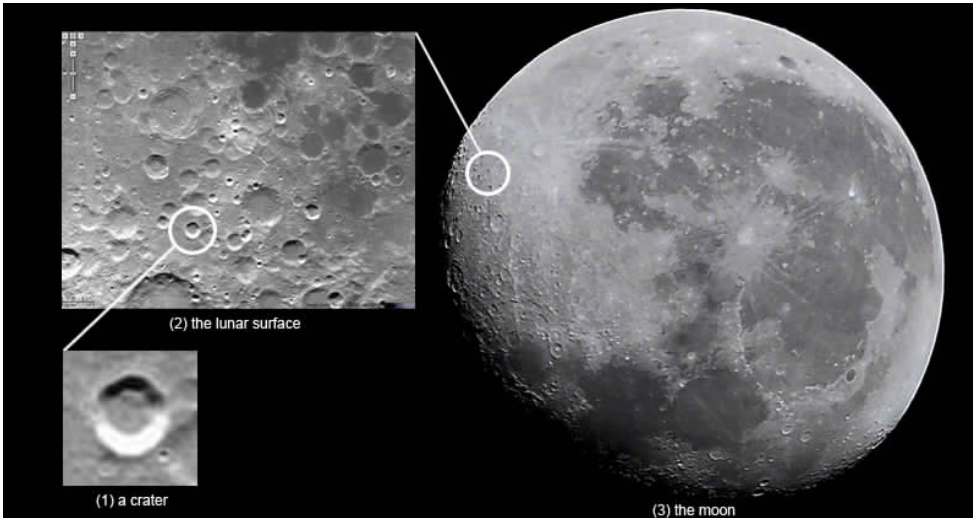
( 1 ).

( “ ”)

2 , 2 (2).

. 2 ,

2 (3) ,



(2) the lunar surface

(1) a crater

(3) the moon

2 “ ” 2

2

(1)

;

(2)

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(3)

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“ ”

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( PC ) ,

( ) . :

(1)

(2)

1 ,

( )

“ ”

279 576

( )

3719

#### 4 标注系统和实验结果

1 (FBC) 6

(Wikipedia) , ( 1). 2

(FAC) 8 , (

Google 2). FBC

FAC

FBC-click-FAC

$MCost@n$  ,

1. ;
2. ;
3. FBC ;
4. FAC;
5. 2 .

##### 4.1 标注平台

- 3 : 、
- Google

表 1 点击检索结果之前需要回答的问题列表 (Form Before Click, 即 FBC 表单)

Form before Click (FBC)

Q1:	1	( / )
Q2:	1	( / )
Q3:	,	( / )
Q4:		( )
A.	(5) B. (4) C. (3) D. (2) E. (1)	
Q5:		( )
A.	(5) B. (4) C. (3) D. (2) E. (1)	
Q6:		( )
A.	(5) B. (4) C. (3) D. (2) E. (1)	

表 2 点击并浏览检索结果之后需要回答的问题列表 (Form After Click, 即 FAC 表单)

Form after Click(FAC)

Q7:	( )	( )	( )	( )	( )	( )	( )
A.	(5) B.	(4) C.	(3) D.	(2) E.	(1)		
Q8:	( )	( )	( )	( )	( )	( )	( )
A.	(5) B.	(4) C.	(3) D.	(2) E.	(1)		
Q9:	( )	( )	( )	( )	( )	( )	( )
A.	(5) B.	(4) C.	(3) D.	(2) E.	(1)		
Q10:	( )	( )	( )	( )	( )	( )	( )
A.	(5) B.	(4) C.	(3) D.	(2) E.	(1)		
Q11:	( )	( )	( )	( )	( )	( )	( )
A.	(5) B.	(4) C.	(3) D.	(2) E.	(1)		
Q12:							
Q13:							
Q14:	( )	( )	( )	( )	( )	( )	( )
A.	(5) B.	(4) C.	(3) D.	(2) E.	(1)		

4.2 标注结果及分析

Answer, QA)

19

1

2

( ), 9

8

19

19

10

719

1659

FBC-click-FAC

539

1238

(1) FBC-click-FAC: FBC FAC

;

(2) FBC :

;

(3) FAC :

(4) :

FBC-click-FAC

click-FAC , 2 FBC-

click-FAC

“1 ” “5 ” ( 1 2).

FBC-click-FAC (Question and ( 3),

Q7+Q8

4.2.1 (Q1+Q2+Q3)

FBC-click-FAC

20.52%

50.09%

10

1 (

10 )

29.57%

( 3),

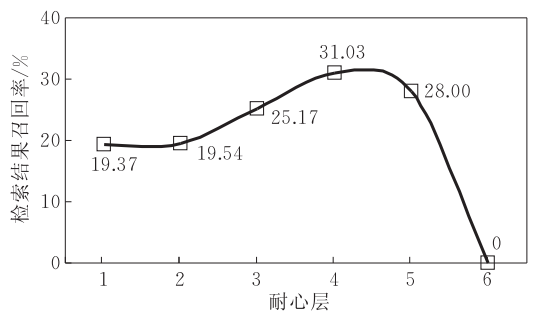
(1)

( “ ” ,

);

(2) ,

( 3).



1~3

表 3 不同耐心层的召回率

	/%	
1	19.37	191
2	19.54	266
3	25.17	429
4	31.03	116
5	28.00	125
6	0.00	90

4.2.2 (Q12)

5 . ,

FBC-click-FAC Q12

(1)

(2)

1 , :

4) , “ ”

. ,  $i$   $j$  ,

$\{i, j\}$  ( $i$   $j$  ,

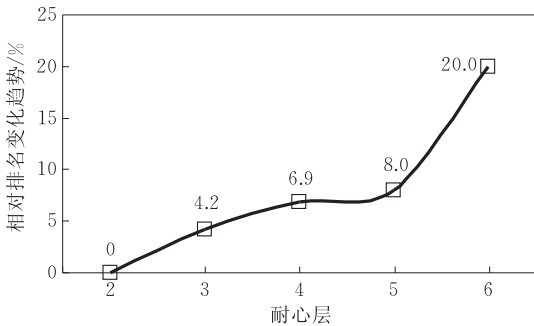
$j$ ),  $k$  (  $\{i, j\}$

. ,  $\{i, k, j\}$ ,  $\{i, j, k\}$ ,

$\{k, i, j\}$  ,  $\{i, j\}$  ,

$\{j, k, i\}$ ,  $\{j, i, k\}$   $\{k, j, i\}$  ,  $\{i, j\}$

( ) .



4

. 4 , ,

. , 4.2.1

, 50.09%

10 . ,

2 ,

( 5). “

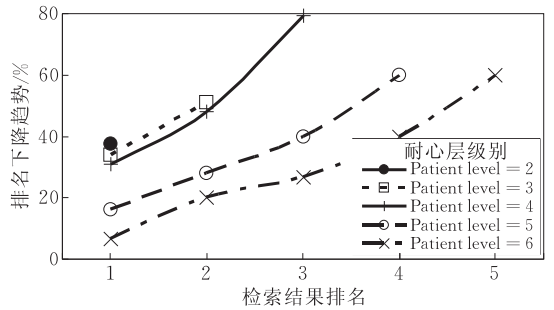
”

. ,  $i$   $j$

$\{i, j\}$ ,  $k$

$\{i, k, j\}$ , ,  $j$

,  $i$  .



5

. 5 , , 1

1 15.4% . ,

1 ,

, ,

( 4 ).

“ ” ,

, . ,

表 4 不同点击的准确率

$i$	/%	$i$	/%
1	15.40	4	1.39
2	6.32	5	0.00
3	5.12		

4.2.3 (Q12) (2) ;

4.2.1 (3) ;

( 3 , (4) .

), ,

4.2.1 ,

( 5). “ ”

FBC-click-FAC

Q7,Q8,Q12 Q13

( ) ,

表 5 不同耐心层的错误修正

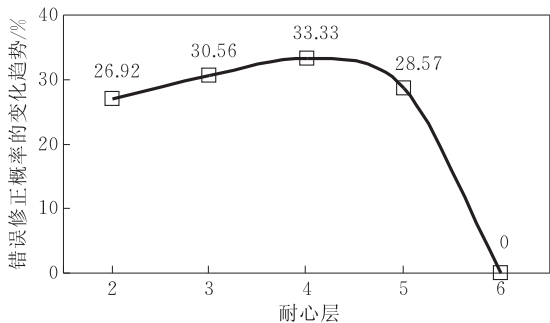
	/%		/%
2	26.92	5	28.57
3	30.56	6	0.00
4	33.33		

5 ,

4 ,

( 6).

4). , 2



6

4.2.4 (Q4+Q5)&(Q7+Q8)

4.2.1 、4.2.2 、4.2.3 ,

(1) ;









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**HONG Yu**, born in 1978, Ph. D., associate professor. His research interests focus on personal information retrieval, topic detection and tracking, information extraction and opinion mining.

**KANG Yang-Yang**, born in 1989, M. S. candidate. His research interest focuses on personal information retrieval.

**YAO Jian-Min**, born in 1971, Ph. D., professor. His research interest focuses on machine translation.

**ZHU Qiao-Ming**, born in 1963, Ph. D., professor. His research interest focuses on Chinese information processing.

**ZHOU Guo-Dong**, born in 1968, Ph. D., professor. His research interest focuses on natural language processing.

### Background

Current universal search engines focuses on mining and recommending all possible relevant information to users. Further, the personal search engines are learning the real intention of users and recommending the information that extremely satisfies the personal requirements. But whether are the satisfactory search results factually factual The answer should be no. In detail, it can be sure that users aim to explore the unknown when using the search engine, and thus they should have little or even no prior knowledge to support their judgments on the satisfaction with the search results. This may result in the probability that any result with a little relation to the query (even wrong one) can be determined to be satisfactory.

The doubts mentions above raise two questions: 1) whether are the satisfactory results always the helpful information for users to acquire knowledge And whether can

they consistently enhance the intelligence of information retrieval 2) If the answer is no, whether does there exist other kind of information to compensate for the potential failings of users even or supersede the satisfactoriness So, in this paper, we propose a hypothesis that the better search results should be factual information.

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