THUIR-LL at the NTCIR-16 Lifelog-4 Task: Enhanced Interactive Lifelog Search Engine

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Outline

1. Lifelog-4 Task

2. Interactive Search Engine
   • Category-Based Query-text Parsing
   • New Feedback Mechanism
   • User Attention Inspired Result Presentation for Interaction

3. Experiment and Result

4. Conclusion and Future Work
• Retrieve a number of specific moments in a lifelogger's life.
  • Input: query of a topic
  • Output: relevant lifelog images
  • Interactive Manner: the user involved in the search process to provide relevance feedback or query reformulation.
• Dataset: 114 days, 183,432 wearable camera images with extracted visual concepts and textual metadata.
Interactive Methods

• Category-based Query-text Parsing
  • Considering verb’s tense and noun’s category

• New Feedback Mechanism
  • Ternary feedback for results
  • Field query with negative key words

• User Attention Inspired Result Presentation for Interaction
  • T-shape distribution
  • Timeline viewing function
Category-based Query-text Parsing

Query Text | Facet Query
---|---
I was lifeloggd when eating lunch at work in my office. | tags in this shot: [food, office]; approximate time: [noon]; location in this shot: [office, work]
Find examples of when I was in meetings with other people in rooms with red carpet. Before that, I had lived in hotel. | tags in this shot: [red carpet, room, rooms, people]; tags in past 1 hour: [hotel]; location in past 1 hour: [hotel]
New Feedback Mechanism

• Ternary feedback for results
• Field query with negative key words

Ranking Model

positive  neutral  negative

negative key words

query text

facet query

rank list

Ternary Feedback

Negative Feedback Boxes
User Attention Inspired
Result Presentation for Interaction

• Users’ examination behavior for text result page and image result page may be different.

• Text result page: "F-shaped distribution" [1]

• Image result page: "T-shaped distribution"[2]

User Attention Inspired
Result Presentation for Interaction
Experiment and Result

- Post vs. pre: the enhancement has improved the system in various metrics
- Expert vs. novice: user's familiarity has a significant influence on the effects
- Adhoc vs. knownitm: retrieval of multi-scene topics is more likely to be affected by differences in user understanding

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<th>KnownItem topic</th>
<th>Adhoc topic</th>
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The interactive method improves significantly in the later stage while it may not be effective in the early stage.

- **Experiment and Result**

![MAP at various time cut-offs](image)

- **MAP at various time cut-offs**
Conclusion and Future Work

• Interactive Search Engine
  • Category-Based Query-text Parsing
  • New Feedback Mechanism
  • User Attention Inspired Result Presentation for Interaction

• Future Work
  • Optimizing methods to eliminate noise in the dataset
  • Exploring how the user’s attention distribution is in lifelog interactive search scenarios
THANKS FOR YOUR ATTENTION!

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