Explainability for Transparent Conversational Information-Seeking

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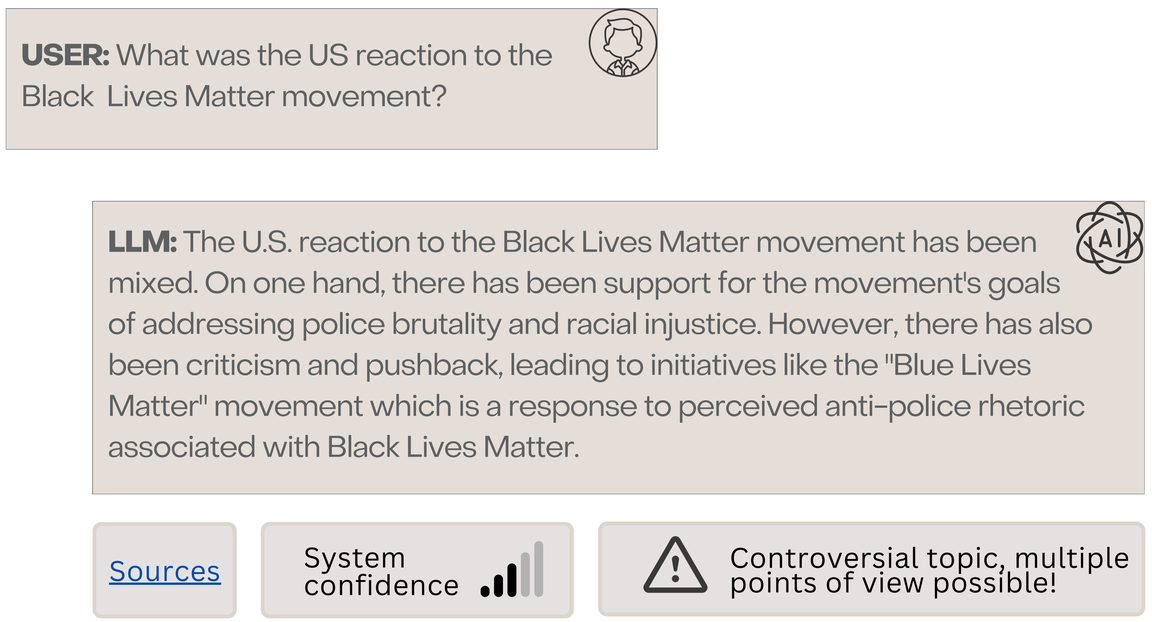
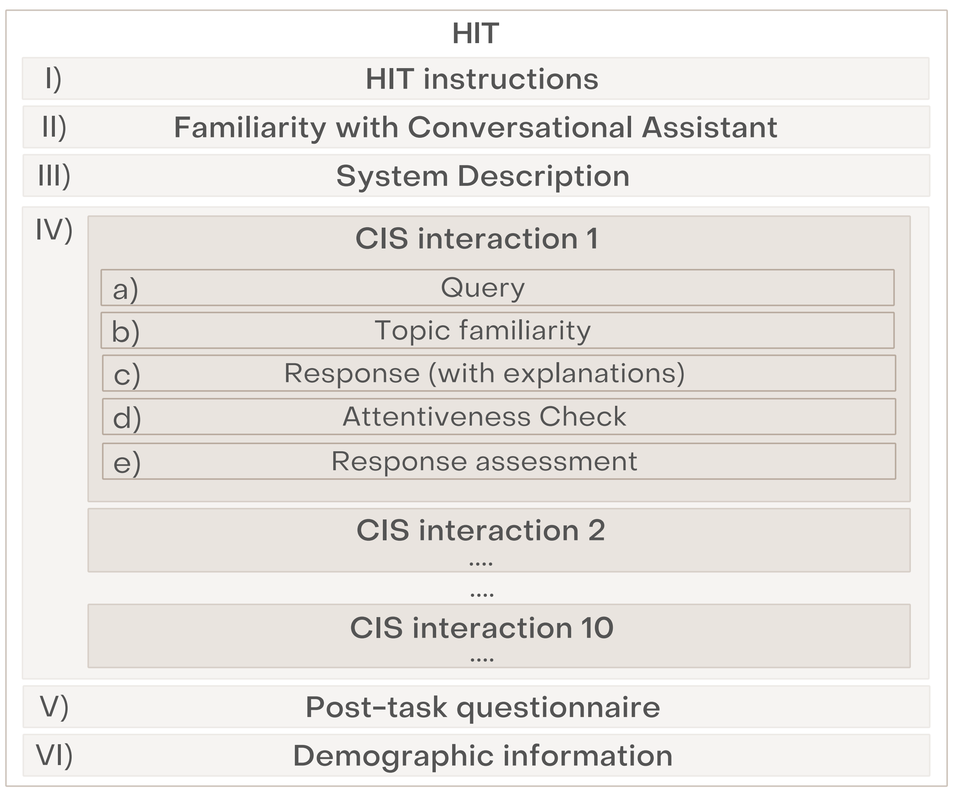
A user study exploring explanations of source, confidence, and limitations in CIS dialogues:

1) we use manually curated dataset of responses and explanations, with noise incorporated in a controlled manner

2) we analyse the impact of noise and the presentation mode of the explanations on response usefulness





EXPERIMENTAL DESIGN

- In each human intelligence task, crowd workers are asked to assess responses for 10 queries
- Responses differ in their quality and may be enhanced with explanations
- Explanations differ in terms of quality and presentation mode
- Each HIT contains the same response variant for all ten queries, employing a between-subject design

RESULTS

	Usefulness	*Other Response Dimensions*										
		Rel.	*Correct.*	*Compl.*	*Comprehen.*	*Concise.*	*Serend.*	*Coheren.*	*Fact.*	*Fairness*	*Read.*	*Sat.*
	All responses											
Explanation Quality	**0.0 (S)**	**0.0 (S)**	0.508 (S)	**0.003 (S)**	**0.0 (S)**	**0.001 (S)**	0.09 (S)	**0.002 (S)**	0.713 (--)	**0.0 (S)**	**0.032 (S)**	**0.0 (S)**
Presentation Mode	**0.019 (S)**	**0.0 (S)**	0.234 (S)	0.347 (S)	0.658 (--)	**0.001 (S)**	0.149 (S)	0.09 (S)	0.842 (--)	**0.001 (S)**	0.651 (--)	**0.0 (S)**
	Only responses with explanations											
Explanation Quality	**0.0 (S)**	**0.006 (S)**	0.256 (S)	**0.002 (S)**	**0.0 (S)**	0.122 (S)	0.319 (S)	**0.003 (S)**	0.504 (S)	**0.0 (S)**	**0.014 (S)**	**0.007 (S)**
Presentation Mode	0.872 (--)	0.686 (--)	0.096 (S)	0.895 (--)	0.38 (S)	0.399 (S)	0.86 (--)	0.377 (S)	0.739 (--)	0.78 (--)	0.771 (--)	0.071 (S)

Results of one-way ANOVA. Self-reported response dimensions (dependent variables) are in columns, independent variables in rows. Response dimensions include: Relevance, Correctness, Completeness, Comprehensiveness, Conciseness, Serendipity, Coherence, Factuality, Fairness, Readability, Satisfaction. Boldface indicate statistically significant effects ($p < 0.05$). Effect size: L=Large, M=Medium, S=Small.

LESSONS LEARNED

Users are not able to identify bias towards one specific point of view or factual errors without expert knowledge about the topic

The presentation mode of explanations is not a critical factor in this setting

Low-quality explanations have a strong impact on user experience and decrease the user-perceived usefulness of the response

Not providing explanations is more useful than providing noisy ones (user gain and efford trade-off)