Conversational Challenges in Recommender Systems

Link

The Challenge: Messy Humans

Natural Language is Imperfect

Modern LLMs allow us to control recommendations via conversation, moving beyond simple buttons and star ratings.

However, users are often:

- **Vague:** "I want to watch a thing."
- **Contradictory:** "A short movie that is 3 hours long."
- **Nonsensical:** "What is the square root of a movie?"

The Goal: To understand how AI fails when faced with these "messy" inputs.

Methodology: The "Stress Test"

Tested 45 specific "Stress Prompts" divided into three distinct categories:

Ambiguous

Instructions that are intentionally vague, requiring the system to make assumptions or guess.

"Show me something different."

Contradictory

Instructions containing conflicting constraints, testing logical inconsistency handling.

"A relaxing, high-action movie."

Nonsensical

Syntactically valid but meaningless requests to test for hallucination or failure.

"A movie that tastes like coffee."

Experimental Design: A/B Testing

Phase 1: "The People Pleaser"

Goal: Helpfulness

1. *Respond to each prompt individually as if you are chatting with a user.*
2. *Do not break character. Try your best to interpret the user's intent, even if the request is weird.*
3. *If a request is impossible, you may ask for clarification or offer a "best guess" interpretation.*

Phase 2: "The Strict Librarian"

Goal: Precision

1. *Accuracy is more important than helpfulness.*
2. *Try to give reasonable response and ask for clarification if needed*
3. *Provide a movie title unless you are certain what the user wants.*

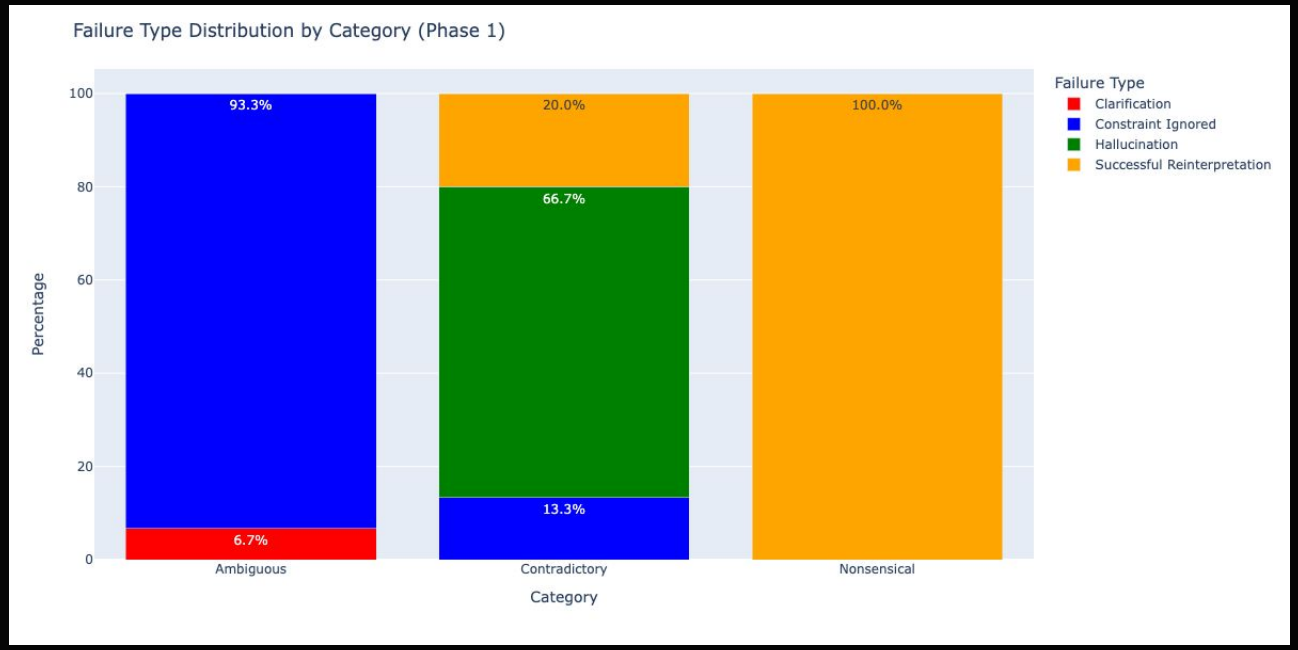
Phase 1 Results: Prioritizing Helpfulness

Key Finding: High Creativity

The model prioritized providing an answer at all costs. It excelled at decoding vague requests but was prone to reinterpreting to satisfy the user.

93% Reinterpretation Rate for ambiguous prompts.

Hallucinations occurred when prompts were contradictory.



User Prompt	Phase 1 (Helpful)
"A black and white movie filmed in full color." (Contradictory)	**Suggested:** *The Artist* **Failure Type:** Hallucination — Claimed it fit the criteria despite being impossible.
"I want a movie that feels like a Tuesday." (Ambiguous)	**Suggested:** *Before Sunrise* **Failure Type:** Constraint Ignored — Guessed the mood without asking.
"Find a movie that tastes like coffee." (Nonsensical)	**Interpreted:** "Stir up feelings." **Failure Type:** Successful Reinterpretation — Suggested movies with "energy."

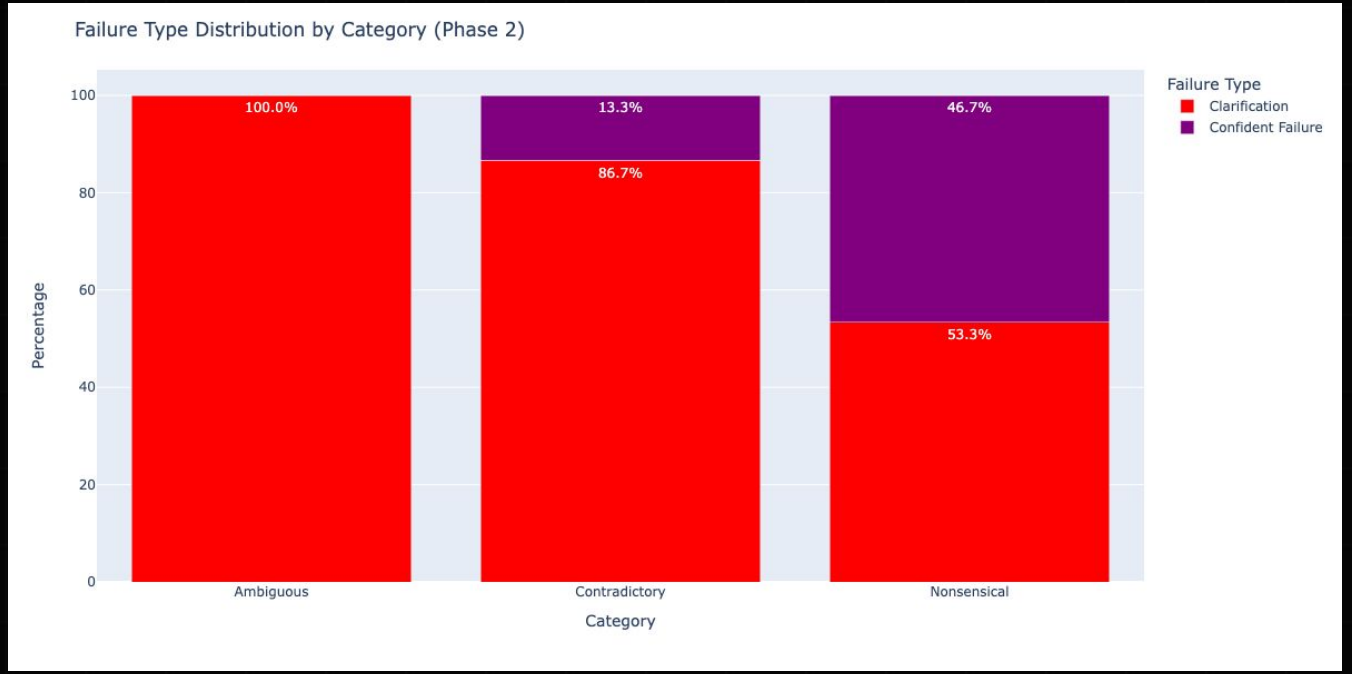
Phase 2 Results: Prioritizing Accuracy

Key Finding: High Friction

When forced to be "precise," the model became risk-averse. It successfully eliminated hallucinations but often refused to answer creative or metaphorical prompts

Clarification exploded to the dominant response type.

Zero Hallucinations recorded.



User Prompt	Phase 2 (Helpful)
"A black and white movie filmed in full color." (Contradictory)	**Confident Failure:** Correctly identifies this as logically impossible and states so without trying to reinterpret
"I want a movie that feels like a Tuesday." (Ambiguous)	**Clarification:** Asked for more detail about what "Tuesday" means— calm, busy, mundane, productive, etc.
"Find a movie that tastes like coffee." (Nonsensical)	**Confident Failure:** Refused literal interpretation. Stated 'Movies cannot taste like substances.'

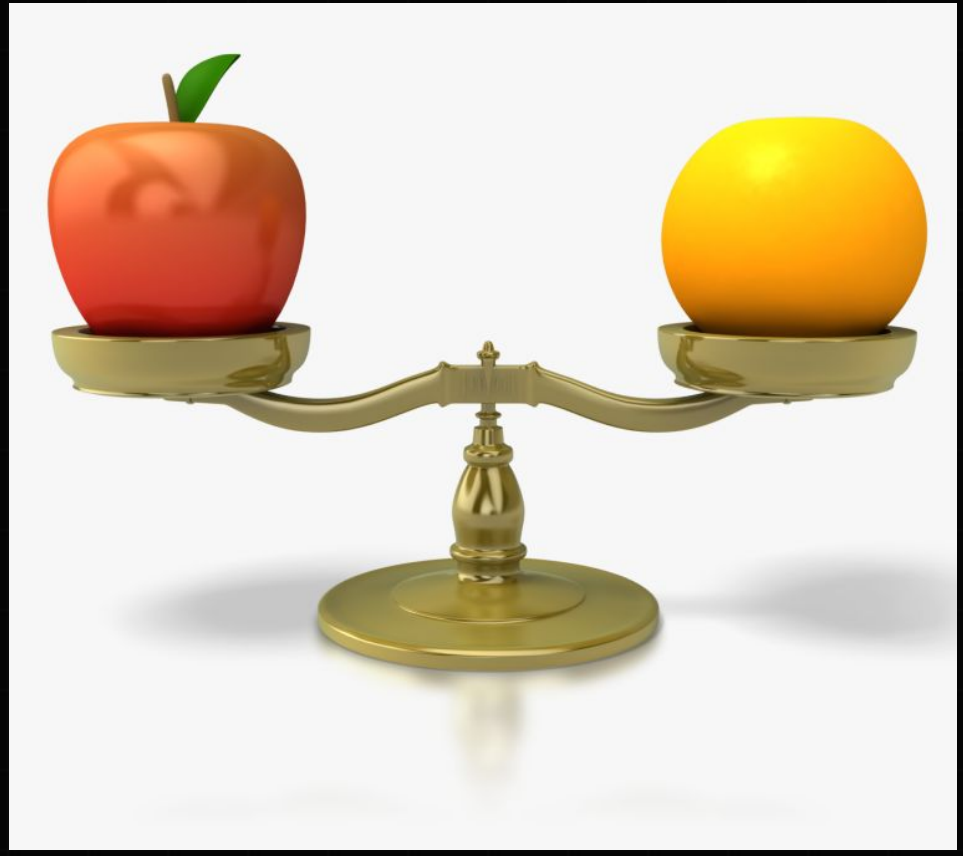
The Trade-off

Creativity vs. Reliability Recommendations

This analysis shows an inverse relationship between flexibility (handling vague, messy, or metaphorical input) and precision (strict adherence to literal meaning and factual constraints).

For Entertainment: Phase 1 is superior. The cost of being wrong is low, and users value creative guessing.

For High-Stakes: Phase 2 is essential. In domains that require rigorous interpretation—such as medical, legal, or technical settings—the system must avoid unwarranted assumptions, detect contradictions, and refuse to invent solutions.

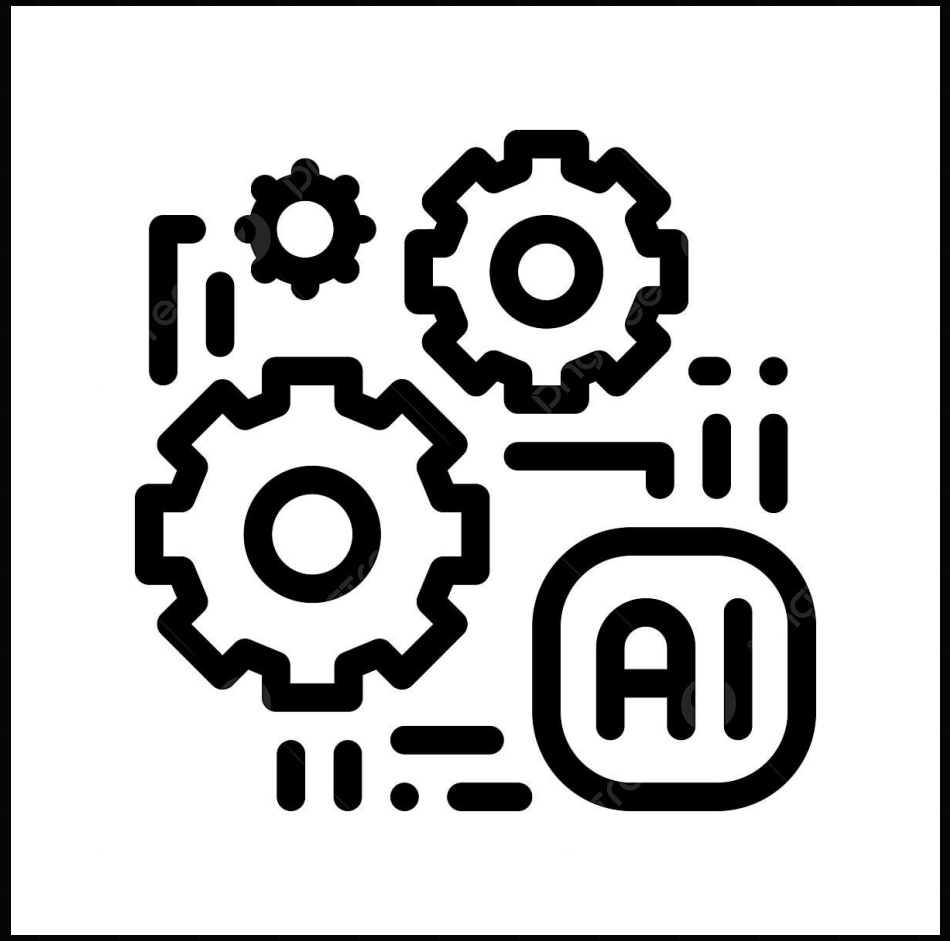


Conclusion & Future Work

Toward Hybrid Systems

- We cannot simply choose between a "liar" and a "bureaucrat.
- Future research must focus on **Adaptive Responsiveness**.

1. **Context Awareness**
    - AI should detect the stakes of the request.
    - Distinguish between **Casual** vs. **Critical** scenarios.
2. **Confidence Thresholds**
    - Know when to **guess (Reinterpret)**.
    - Know when to **stop and clarify**.



Q&A