

INSPIRED:

Toward Sociable Recommendation Dialog Systems

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In this talk



Why we want
INSPIRED

How we collect &
annotate
INSPIRED

What we do with
INSPIRED



Why INSPIRED

I want to watch
a movie

What movie
should I watch?

Have watched these **MOVIES**

Favorite genres



Comedy?
Action?
Musical?



Friend



Hi there! I can help you find a movie to watch

Seeker



Recommender



Hi there! I can help you find a movie to watch

Seeker



Hello, that's great! What movie do you recommend?

Recommender



Opening

Seeker



Hi there! I can help you find a movie to watch

Hello, that's great! What movie do you recommend?

Recommender



Hi there! I can help you find a movie to watch

Hello, that's great! What movie do you recommend?

Seeker



I have some favorite movies that I like.

Recommender



Hi there! I can help you find a movie to watch

Hello, that's great! What movie do you recommend?

Seeker



I have some favorite movies that I like.

Recommender



But first can you tell me your favorite movie?

Hi there! I can help you find a movie to watch

Hello, that's great! What movie do you recommend?

Seeker



I have some favorite movies that I like.

But first can you tell me your favorite movie?

Recommender



I just watched Finding Nemo. I really like it.



Seeker

Hi there! I can help you find a movie to watch

Hello, that's great! What movie do you recommend?

I have some favorite movies that I like.

But first **can you tell me your favorite movie?**

I just watched Finding Nemo. I really like it.

Awesome! **Do you like Disney movies in general?**

Recommender





Seeker

Hi there! I can help you find a movie to watch

Hello, that's great! What movie do you recommend?

I have some favorite movies that I like.

But first can you tell me your favorite movie?

I just watched Finding Nemo. I really like it.

Awesome! So do you like Disney movies in general?

Yup! They are so colorful and full of life.

Recommender



Getting to know her movie preference

Seeker



I have some favorite movies that I like.

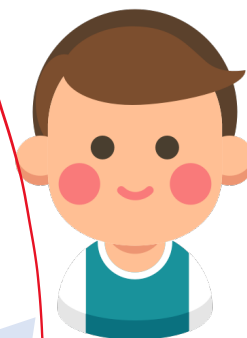
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Seeker



I have some favorite movies that I like.

But first can you tell me your favorite movie?

I just watched Finding Nemo. I really like it.

Awesome! So do you like Disney movies in general?

Yup! They are so colorful and full of life.

Yeah! I love Disney too! I have Disney + and watch it every day haha...

Recommender



Seeker



I have some favorite movies that I like.

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Awesome! So do you like Disney movies in general?

Yup! They are so colorful and full of life.

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Have you seen the new Lady and the Tramp?

I found it relatable to my dog!

Recommender



Seeker



I have some favorite movies that I like.

But first can you tell me your favorite movie?

I just watched Finding Nemo. I really like it.

Awesome! So do you like Disney movies in general?

Yup! They are so colorful and full of life.

Me too! I have Disney + and watch it every day haha...

Recommendation!

Have you seen the new **Lady and the Tramp?**

I found it relatable to my dog!

Recommender



Yeah! I love Disney too! I have Disney + and watch it every day
haha...

Have you seen the new Lady and the Tramp?
I found it relatable to my dog!

Seeker



Recommender



Never heard of that one! What is it about?

Yeah! I love Disney too! I have Disney + and watch it every day
haha...

Have you seen the new Lady and the Tramp?
I found it relatable to my dog!

Asking a question about the
recommended movie

Never heard of that one! What is it about?

Seeker



Recommender



Yeah! I love Disney too! I have Disney + and watch it every day
haha...

Have you seen the new Lady and the Tramp?
I found it relatable to my dog!

Seeker



Recommender



Never heard of that one! What is it about?

It's about a dog name Lady who runs away with
a stray dog named Tramp. **What do you think?**

Yeah! I love Disney too! I have Disney + and watch it every day
haha...

Have you seen the new Lady and the Tramp?
I found it relatable to my dog!

Seeker



Recommender



Never heard of that one! What is it about?

It's about a dog name Lady who runs away with
a stray dog named Tramp. What do you think?

Woo sounds good! I definitely want to see this.
Thank you!

Yeah! I love Disney too! I have Disney + and watch it every day
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Have you seen the new Lady and the Tramp?
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Recommender



Recommendation is accepted!

It's about a dog name Lady who runs away with
a stray dog named Tramp. What do you think?

Woo sounds good! **I definitely want to see this.**
Thank you!

Characteristics of INSPIRED

Natural: 1,001 dialogs collected without restriction on choosing the movie to recommend

Diverse Conversation Types: Friendly dialogs with movie discussion, not just Question-Answering pairs

Annotated with Sociable Strategies: strategies drawn from social science theories (Yoo et al., 2012; Altman, 1973; O'Keefe, 2004; Lazarsfeld and Merton, 1964)

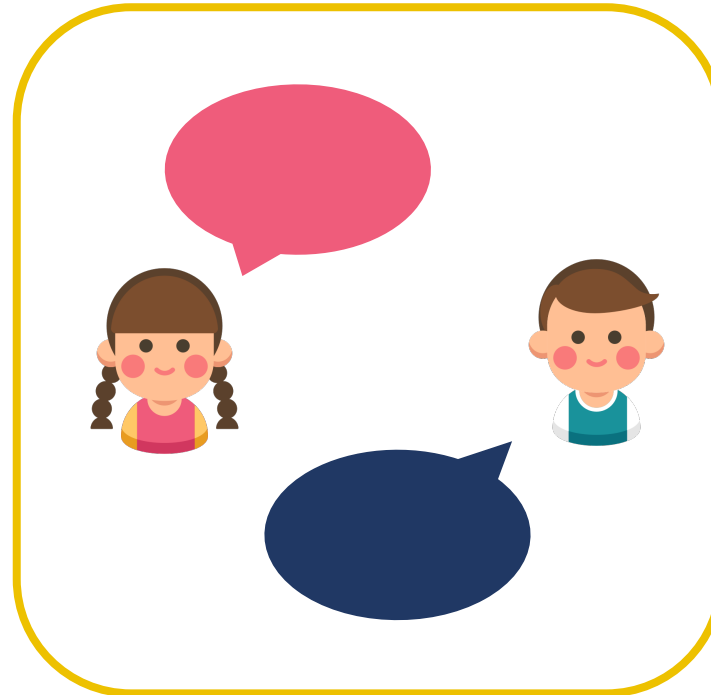


**How we collect & annotate
INSPIRED**

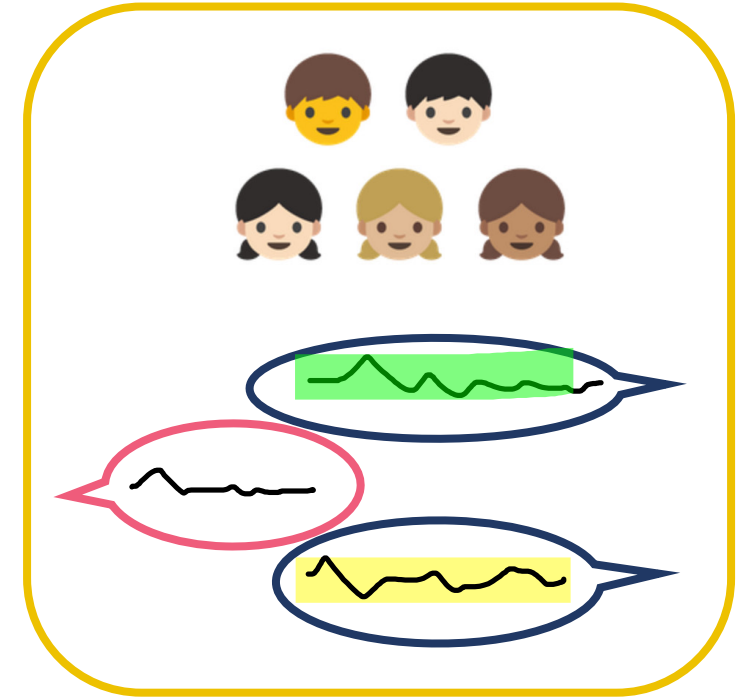
Dataset Creation



Movieclips Trailer
MovieLens



Chat on **ParlAI**

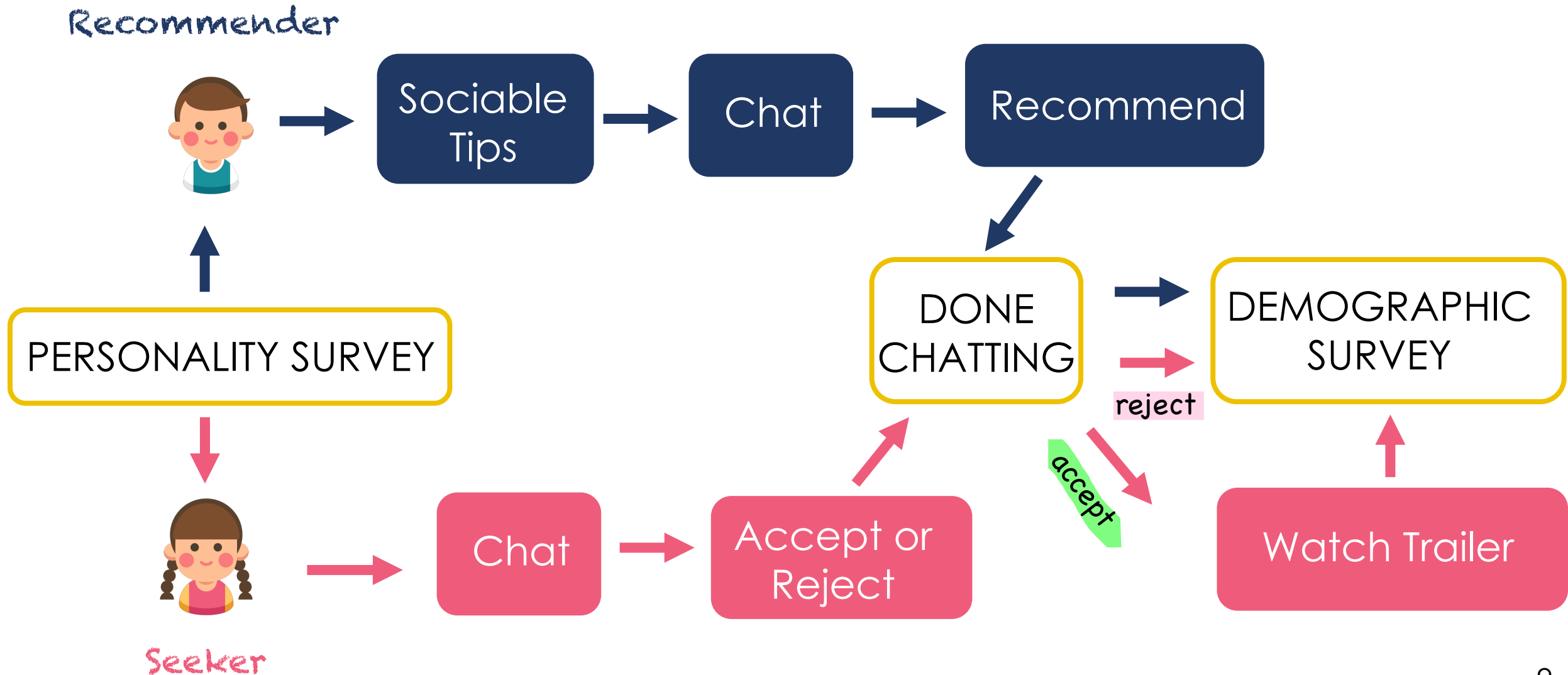


Annotate

Mechanical Turk Workers

Qualifications: Live in US, 90% task acceptance rate.

Dialog Collection



Recommendation Strategies

8 SOCIABLE STRATEGIES

Personal Opinion

Encouragement

Credibility

Personal Experience

Offering Help

Self Modeling

Similarity

Preference Confirmation

2 PREFERENCE ELICITATION INQUIRIES

Experience Inquiry

Opinion Inquiry

Seeker



I have some favorite movies that I like.

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Awesome! So do you like Disney movies in general?

Yup! They are so colorful and full of life.

Yeah! I love Disney too!

I have Disney + and watch it every day haha...

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Personal Opinion

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Personal Experience

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Recommender



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Experience Inquiry

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Recommendation!

I found it relatable to my dog!

Seeker



Recommender



Dialog Annotation

2 Experts



30 random dialogs, $\kappa = \mathbf{0.77}$

5 Workers



1 evaluation dialog + 9 unlabeled dialogs

Agreement score with expert $> \mathbf{\underline{0.60}}$

Inter-annotator agreement among workers: **0.78**



What we do with **INSPIRED**

What Strategies Contribute to Successful Recommendations?

Successful: Accept, watch the trailer, **rate 4 or 5** ★★★★★

Unsuccessful: Reject or accept but later say that the movie does not seem interesting

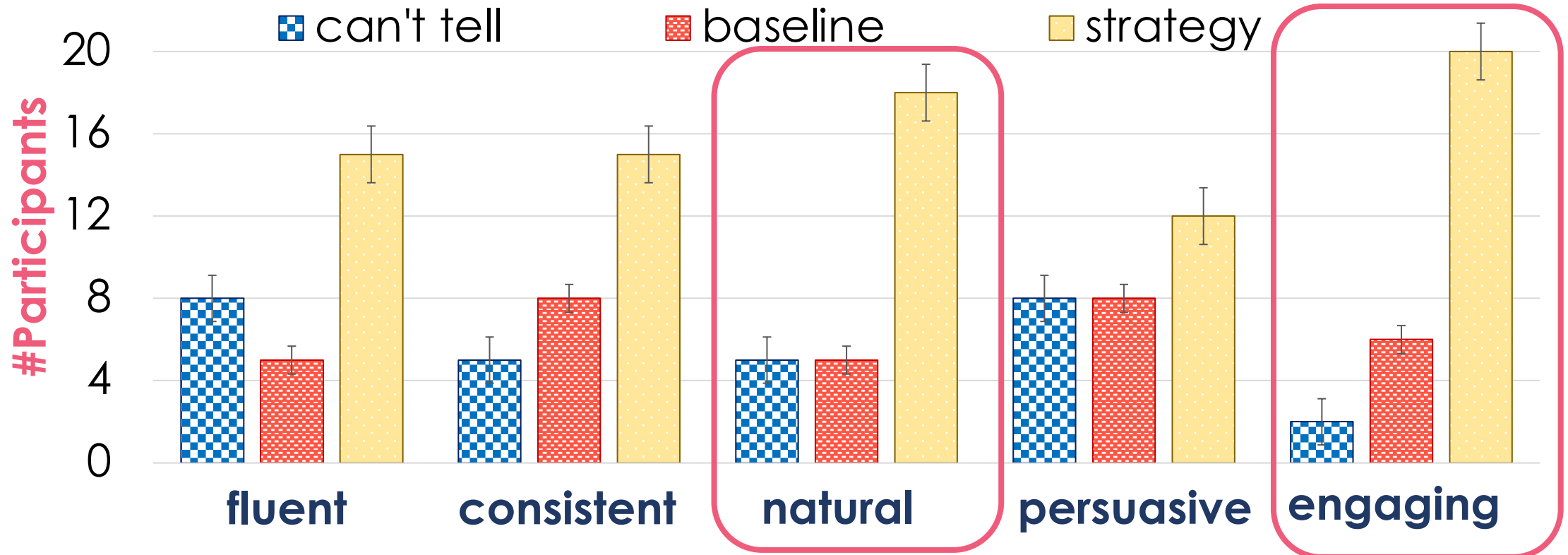
Strategy	Coefficient
Personal Opinion	0.12*
Personal Experience	0.04
Similarity	<u>0.24*</u>
Encouragement	0.17**
Offering Help	0.02
Preference Confirmation	0.05
Self-Modeling	0.02
Credibility	0.07

Inquiries & Movie Attributes	Coefficient
Experience Inquiry	-0.01
Opinion Inquiry	0.04
Recently Released	0.17
Popularity	-0.10
Action	-0.01
Romance	-0.03
Thriller	0.25
Comedy	-0.06
Drama	0.34

Recommendation Chatbot

Baseline Model: 2 separate Transformer-based models pretrained with GPT-2 with an external recommendation system (**BLEU: 5.11, ppl: 9.28**)

Strategy Model: <Strategy> + Dialog input to the baseline model + heuristics for selection (**BLEU: 6.63, ppl: 8.93**)



Takeaways

①

We release **INSPIRED**, a new recommendation dialog dataset annotated with **sociable strategies** with **success measures**

②

Sociable strategies have a positive impact for **successful recommendation** and **better dialog quality**

Chat with our bot: <http://language.cs.ucdavis.edu:7777/>

Dataset: github.com/sweetpeach/Inspired

Thank you!

github.com/sweetpeach/Inspired