

# Conversational Information Seeking: Theory and Application

 #TheCISTutorial

Part 3: Conversational Interfaces and Results Presentation



# What is a conversation? (recap)

- Merriam-Webster Dictionary
  - “oral exchange of sentiments, observations, opinions, or ideas”
- Brennan (2012)
  - “a joint activity in which two or more participants use linguistic forms and nonverbal signals to communicate interactively”
- Zamani et al. (2022)
  - “interactive communication for exchanging information between two or more participants (i.e., humans or machines) that involves a sequence of interactions”



# What is a conversational interface?

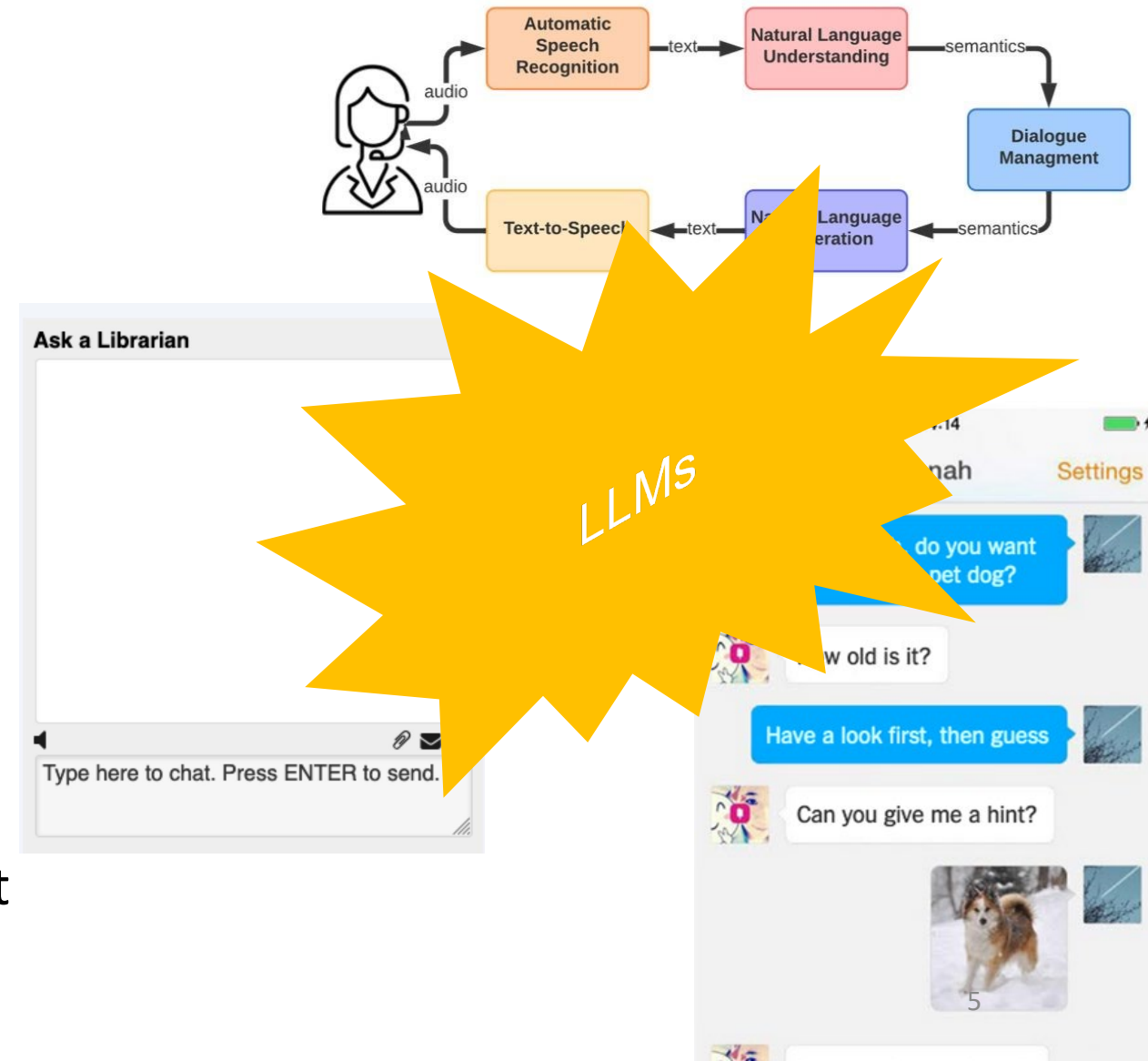
- Front-end to a chatbot or virtual personal assistant
- Integrates all system components
- Can also act as the orchestrator

# What makes an interface conversational?

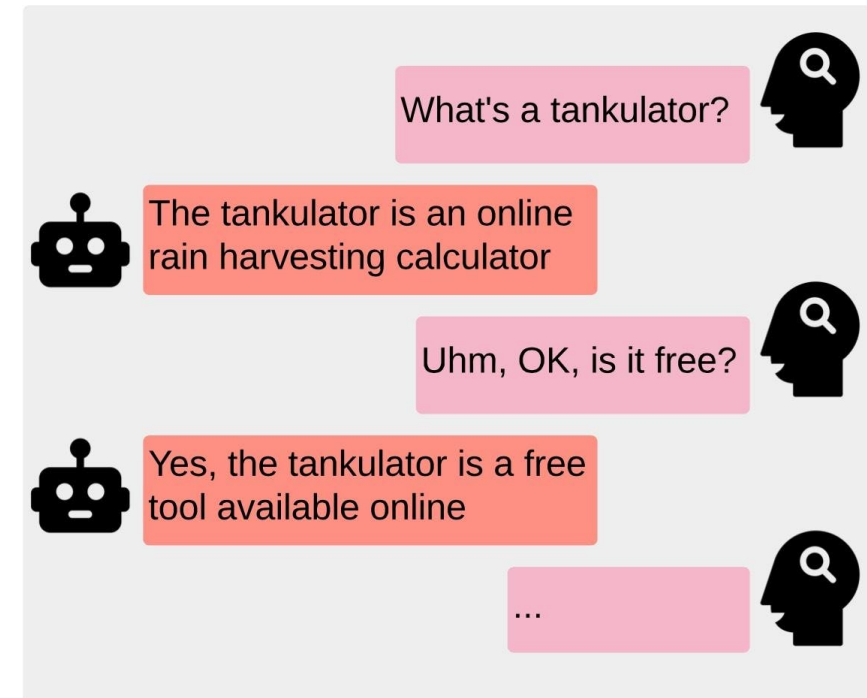
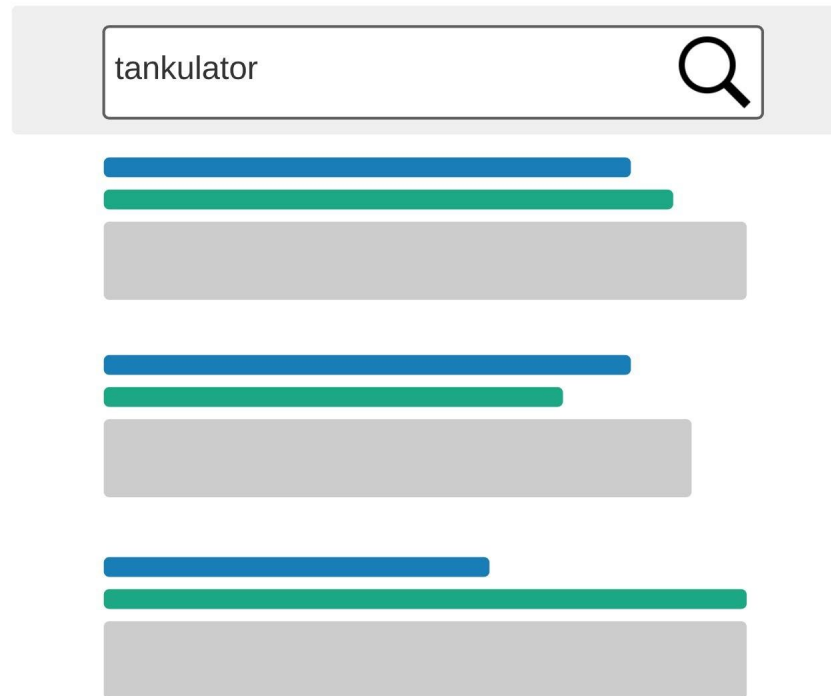
1. Natural language
2. Conversational interaction style

# Different conversational interfaces

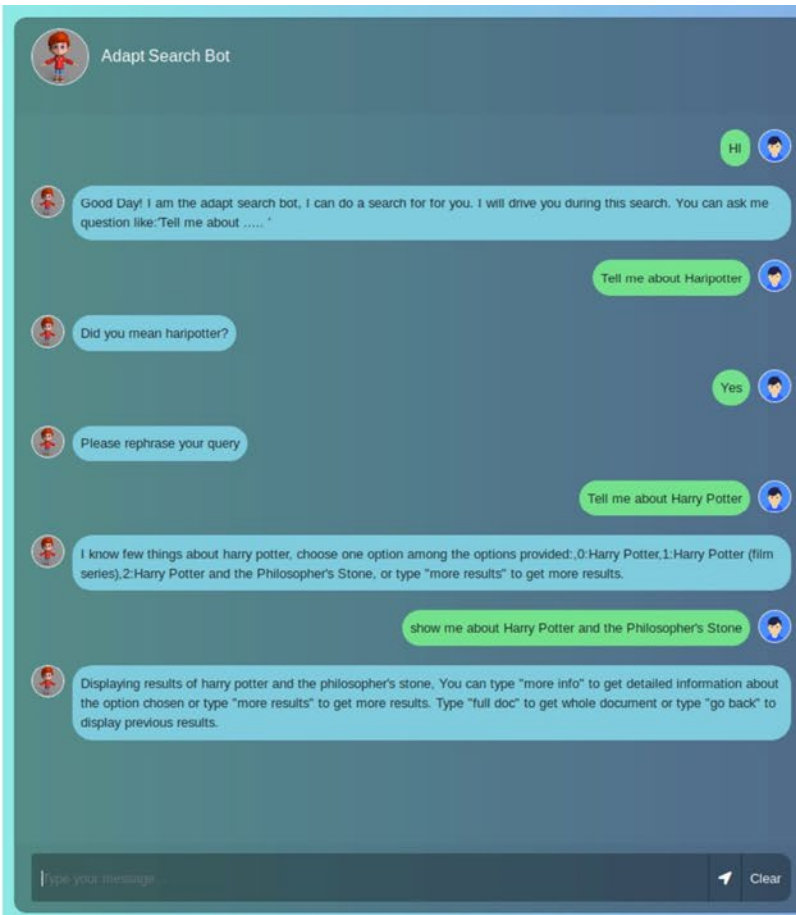
- Spoken Dialogue System
  - Task-oriented with clear boundaries
  - Academic and research
- Voice User Interface
  - Task-oriented to help clients
  - Re-routing to a human agent
  - Industry
- Live Chat Support
  - Call taker or customer provider
- Chatbots
  - Social engagement through chit-chat



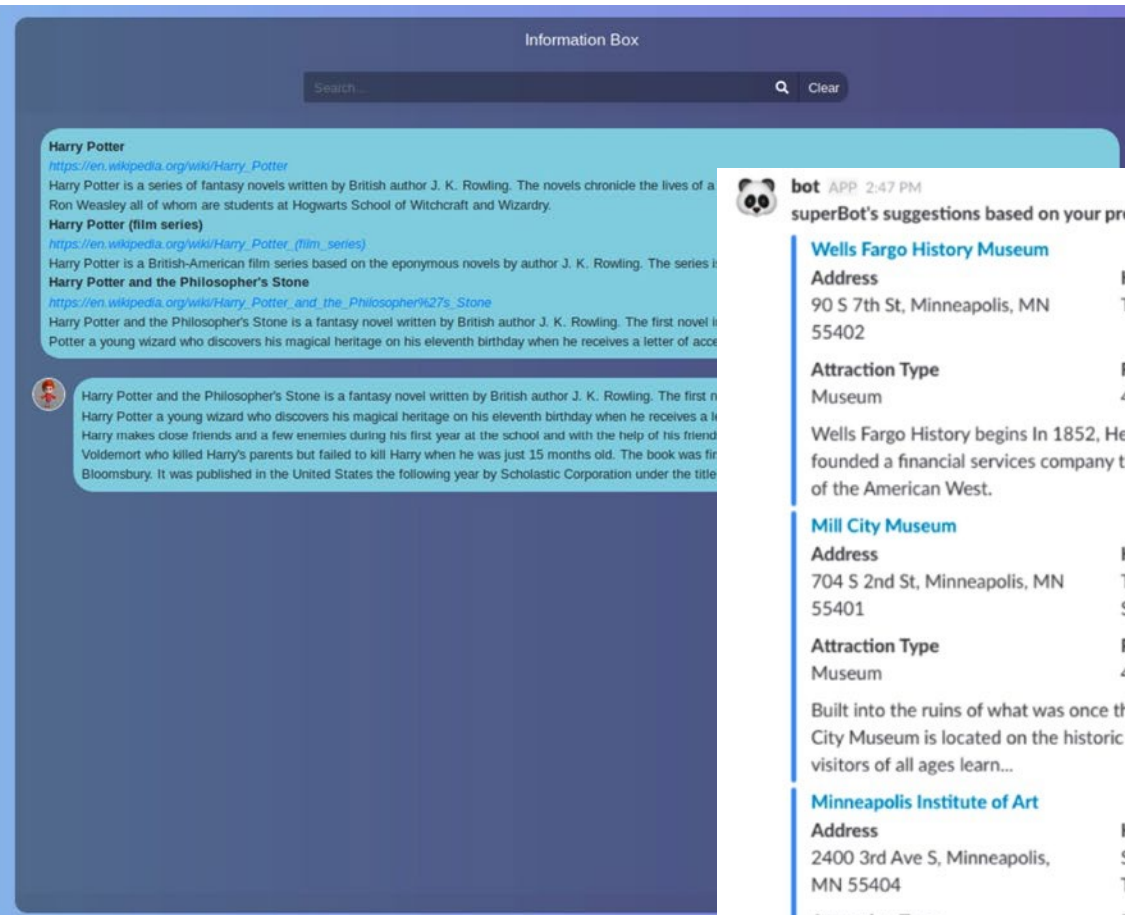
# Result presentation



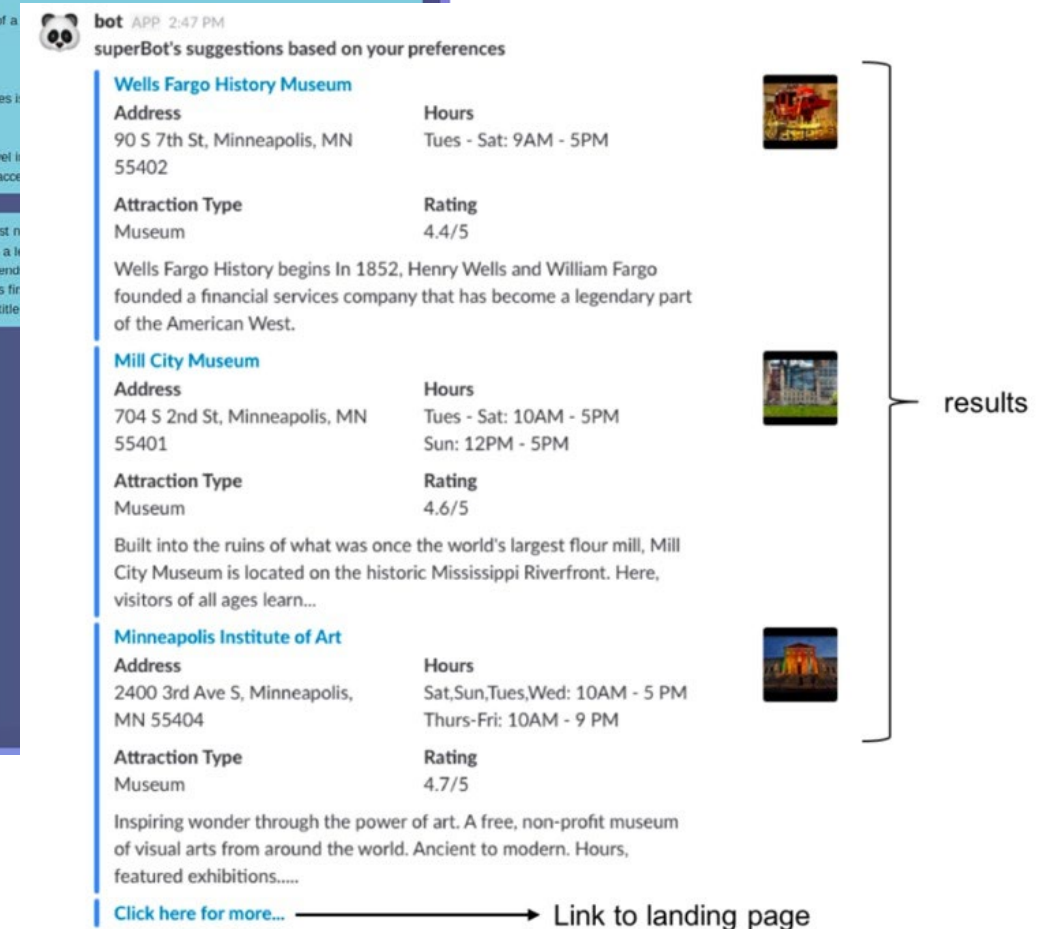
# Text-only conversational result presentation on desktops



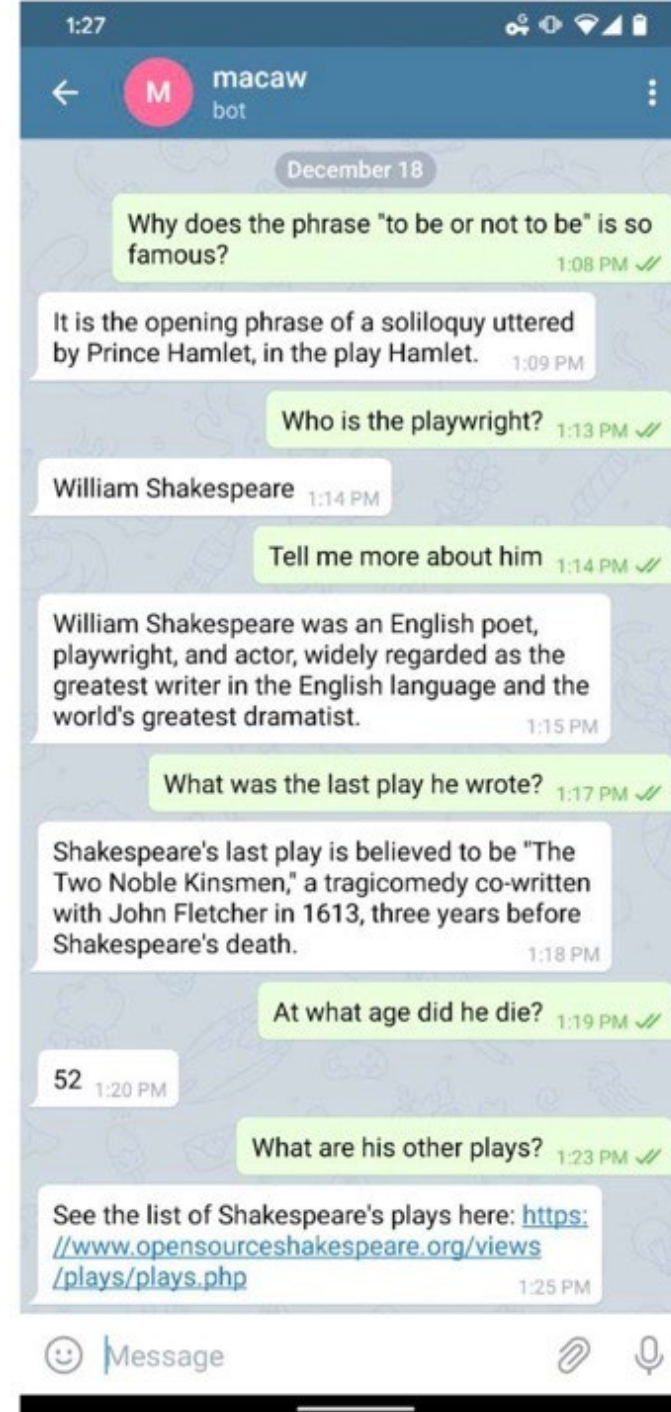
Kaushik et al. (2020)



Avula et al. (2018)



# Text-only conversational result presentation on small screens







## What is conversational information seeking



Conversational information seeking refers to the process of obtaining information through a dialogue or conversation with another person, rather than through independent research or inquiry. It involves engaging in a back-and-forth exchange of questions, answers, and clarifications in order to gain a better



## What is conversational information seeking



Conversational information seeking (CIS) is a type of information seeking that involves a sequence of interactions between a user and an information system. The interactions are primarily based on natural language dialogue, while they may also include other types of interactions, such as click, touch, and body gestures.

CIS is a relatively new field of research, but it has the potential to revolutionize the way we interact with information systems. For example, CIS can be used to create more natural and engaging user experiences, to provide more personalized and relevant information, and to help users better understand the information they are seeking.

Some of the challenges associated with CIS include:

- Natural language understanding and generation is a complex task, and it can be difficult to create systems that can understand and respond to user queries in a natural and accurate way.
- CIS systems need to be able to handle a wide range of user queries, from simple to complex.
- CIS systems need to be able to learn and adapt to user preferences over time.

Despite these challenges, CIS is a promising field of research with the potential to make a significant impact on the way we interact with information systems.



Enter a prompt here



Bard may display inaccurate or offensive information that doesn't represent Google's views.

MacBing



Microsoft Bing

SEARCH

CHAT

Let's learn together. Bing is powered by AI, so surprises and mistakes are possible. Make sure to check the facts, and [share feedback](#) so we can learn and improve!

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Choose a conversation style [Preview](#)

More  
Creative

More  
Balanced

More  
Precise

What is conversational information seeking

### conversational information seeking

wers for you...

information seeking (CIS) is concerned with a sequence of interactions between users and an information system. Interactions in CIS are primarily based on natural language, while they may include other types of interactions, such as click, touch, and body gestures.

What else you would like to know about CIS?

1. xiv.org 2. dl.acm.org 3. deepai.org

1 of 20



What are some applications of CIS?

How does CIS work?

Teach me a new word!



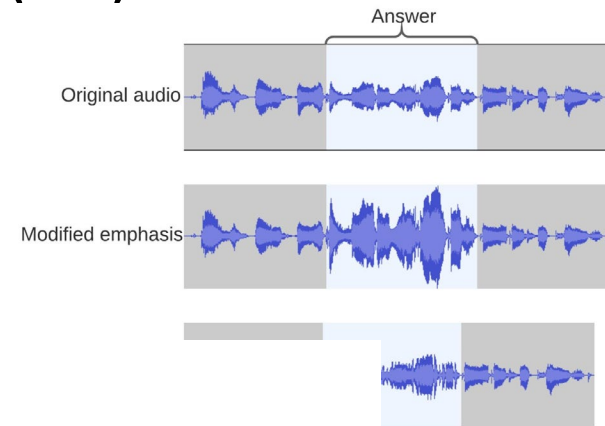
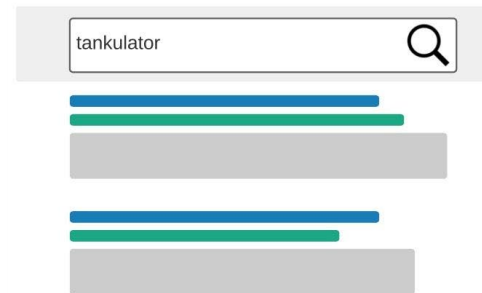
Ask me anything...



Feedback

# Speech-only result presentation

- “Ten Blue Links” or SERP
- What is the information to present?
- Which modality(ies) should we use to present this information?
- How to present the information using this(ese) modality(ies)?
  - Information units?



# Multi-modal result presentation

- Multi-modal CIS (MMCIS)
  - Multiple input and output devices are used
  - Coupling the intuitiveness of conversation with human conversation
- Rousseau *et al.* (2006)
  - **What** is the information to present?
  - **Which** modality(ies) should we use to present this information?
  - **How** to present the information using this(ese) modality(ies)?
  - and **Then**, how to handle the evolution of the resulting presentation?

## Mandatory to wear mask



In some countries masks are worn in accordance with local customs or in accordance with advice by national authorities in the context of COVID- 19. In these situations, best practices should be followed about how to wear, remove, and dispose of them, and for hand hygiene after removal. It is strongly recommended that you wear a face mask when you have visitors at your home, and that your visitors also wear masks. It is also recommended that when you visit others you also wear a mask. You should always use hand sanitiser or wash your hands before and after changing your face mask. . .



Is it mandatory to wear a mask?



Do you mean in general or in public spaces?

More in public spaces with all the COVID things.

According to the ABC News, many countries around the world, as well as some US states, ask people to wear face masks in public places to limit the spread of the COVID-19 virus.

Uhm, and what about if I visit my mum?

In Australia, the current advice from the Federal Government is that it is recommended that when you visit others you also wear a mask.

...

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# Interface limitations in conversational systems

- Natural language input
  - ASR
  - NLU
  - Filler words ("uhm", "ah")
  - Pauses
- Non-explicit information needs
  - Tone of voice
- Results presentation
  - Graphs
  - Images
- Speech-only conversational interfaces
- Biases of personas
- Documents
- ...

# Questions



#TheCISTutorial

Foundations and Trends in  
Information Retrieval  
(to appear)

## Conversational Information Seeking

Hamed Zamani, Johanne Trippas, Jeff Dalton,  
and Filip Radlinski

**now**  
the essence of knowledge

<https://arxiv.org/pdf/2201.08808.pdf>