

# **Dialogue Topic Tracking**



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## TABLE OF CONTENT

- INTRODUCTION
- CHALLENGES AND GOALS
- APPROACHES AND TECHNIQUES
- APPLICATIONS AND USE CASES
- FUTURE DIRECTIONS AND CHALLENGES

# INTRODUCTION

- **What Is Dialogue Topic Tracking ?**

Dialogue topic tracking is like a mental GPS for conversations. It helps us keep track of which topic we're currently discussing during a multi-topic chat.

- **Why Is It Important ?**

Effective dialogue topic tracking is essential for creating smart chatbots that understand context and respond appropriately, even when the conversation jumps from one topic to another.

- **How Does It Work?**

It uses techniques like memory networks (inspired by how our brains remember things) to keep track of ongoing topics.

- **Applications:**

- Smart Devices
- Understanding Human Behavior

## CHALLENGES AND GOALS

- **Challenges:**

- Detective Work
- Topic Jumps
- Speech Errors
- Language Ambiguity

- **Goals:**

- Accurate Tracking:
- Robustness:
- Smooth Conversations

## **APPROACHES AND TECHNIQUES**

- Sequential Labeling:
- Neural Networks:
- Dynamic Memory Networks:

## Sequential Labeling

- Sequential labeling in a conversation involves tagging each sentence with a specific topic.
- This method helps machines understand when the conversation changes topics.
- It's like putting sticky notes on different parts of a story to guide readers through the main ideas being discussed.
- By assigning topic tags in order, machines can follow the flow of the conversation and identify topic shifts.
- This approach aids in organizing and structuring dialogue, enabling computers to better comprehend the context and meaning behind spoken words.

# Neural Networks

- Neural networks are models inspired by the human brain, designed to help machines learn and understand information.
- **Convolutional Neural Networks (CNNs)** focus on identifying patterns in nearby data, making them great for tasks like image recognition.
- **Recurrent Neural Networks (RNNs)** are good at remembering sequences of data, which is useful for tasks where the order of information matters.
- **By combining CNNs and RNNs**, machines can better track topics in conversations by recognizing patterns and understanding the context over time.
- This combination allows machines to not only identify local features but also consider the sequential flow of information, enhancing their ability to follow topics in a conversation effectively.

## **Dynamic Memory Networks**

- Dynamic Memory Networks are like a memory bank that stores information in slots.
- These networks utilize read-writable memory slots to capture the context of a conversation.
- They are inspired by how our brains remember things, aiding in tracking topics across different sentences.
- By mimicking the human memory system, Dynamic Memory Networks enhance machines' ability to understand and follow the flow of topics in conversations effectively.
- The use of read-writable memory slots allows these networks to retain and update information as the dialogue progresses, enabling better topic tracking and comprehension.

## **APPLICATIONS AND USE CASES**

- Smart Devices and Voice Assistants:**

1. Ever talked to Siri, Alexa, or Google Assistant? They use dialogue topic tracking.

- Understanding Human Behavior:**

1. Researchers study how people handle multiple topics during chats.
2. It helps us learn how humans naturally transition between subjects.

- Information Organization:**

1. Dialogue topic tracking helps organize unstructured information, making it easier for users to find related content.

## FUTURE DIRECTIONS AND CHALLENGES

### Real-Time Tracking:

- Imagine tracking topics as they shift in a live conversation.

### Multilingual Topic Tracking:

- Languages are like colorful threads in a global conversation quilt.
- Systems need to track topics across diverse languages, not just English.

### User Intent Prediction:

- Think of predicting what users want next.
- Systems should anticipate topic switches based on user cues.

### Adapting to Context Shifts:

- Conversations can zigzag unexpectedly.
- Future topic trackers must adapt when context suddenly shifts.

**THANK YOU**