Avishkar Research Convention: 2023-2024
Abstractive Summarization & Automated Minutes of Meeting for Virtual Meetings

Category: 5   **Slot No.:**   **Level: UG**

Introduction

- For professional meetings, it is common practice to produce a minutes of meeting document which gets distributed to the participants and summarizes the meeting.

- A minutes of meeting document contains meeting agenda, attendee list and a list of action items with task owner names and deadlines or a list of decisions and votes.

- The aim is to automate this process of producing minutes of meeting document for online and offline meeting with the help of AI and Deep Learning.

Objectives

- Allow meeting participants to focus on the discussion and collaboration during the meeting rather than taking notes or remembering tasks.

- Ease and automate the process of virtual meetings for professionals and organizations by streamlining the experience and bossting efficiency and productivity.

- Leverage Natural Language Processing and Deep Learning techniques to summarize meetings, generate transcripts, track attendees, etc.

Architecture
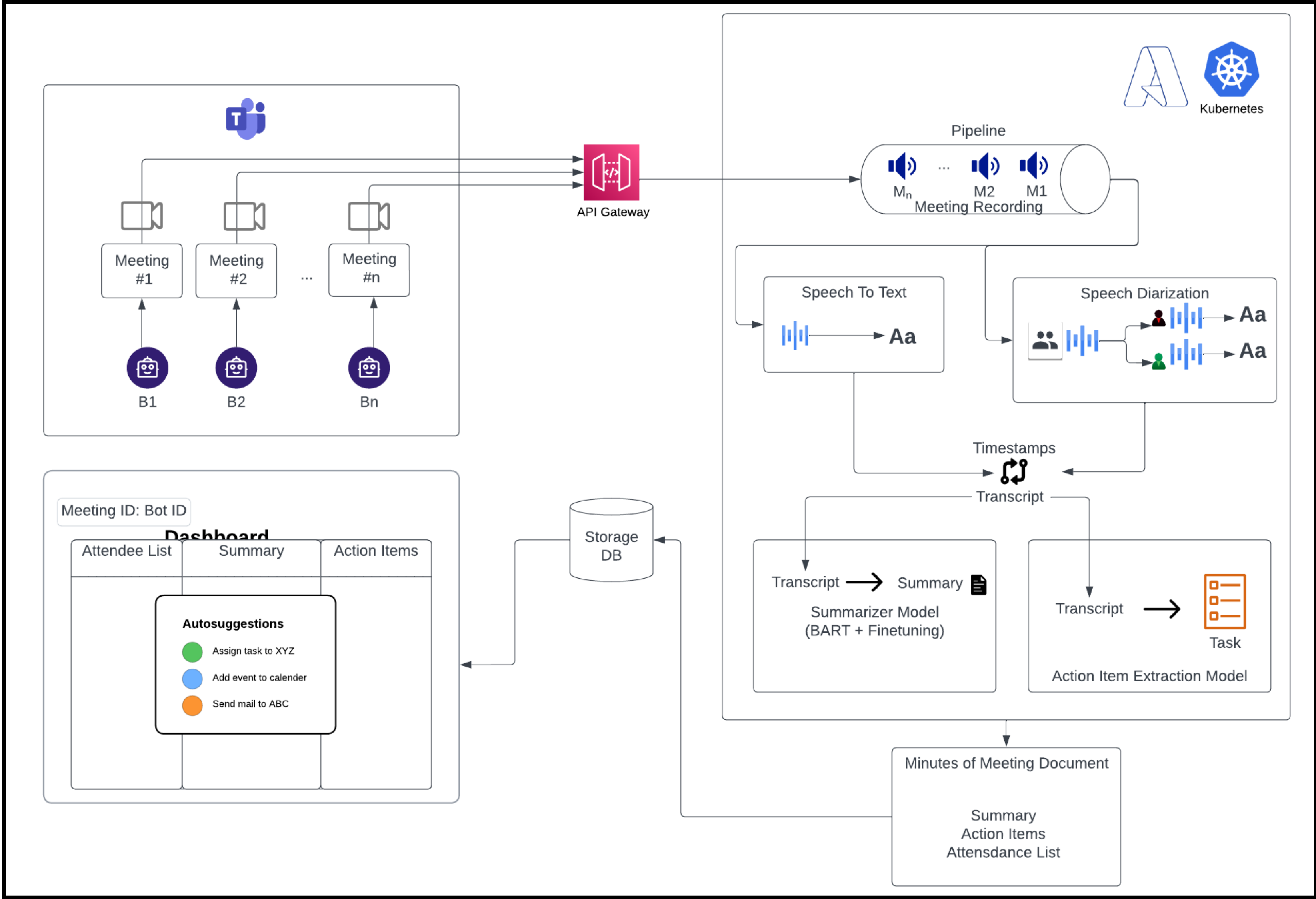
Algorithms
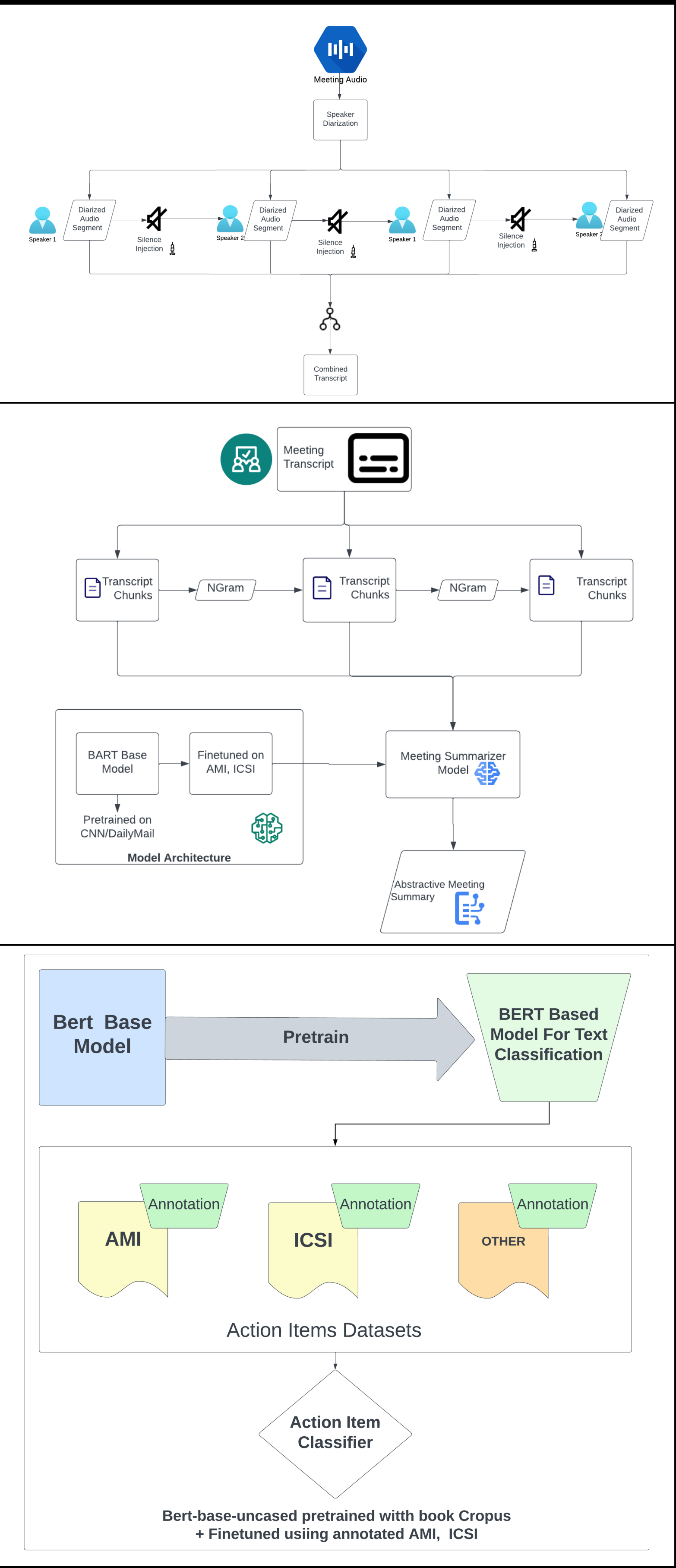
Sample Output

Quarterly Business Review and Strategy Meeting

Online Meeting Platform:	Google Meet
Date:	17th December 2023
Time:	9:15 am
Attendees:	John Smith, Emily Devis, Michael Johnson, Sarah Lee, James Anderson

Agenda items:

Action items	Owner(s)	Deadline	Status
Ensure Q4 production targets are met	John Smith - CEO	-	-
Monitor implementation of quality control system	Emily Devis- COO	20th December 2023	Completed
Provide detailed revenue and expense breakdown for Q3	Michael Johnson- CFO	24th December 2023	Not Started
Maintain momentum in marketing campaign	Sarah Lee- Head of Marketing	24th December 2023	On Hold
Continue collaboration with marketing for lead conversion	James Anderson – Head of Sales	31st December 2023	In Progress

Meeting Summary:

In the Quarterly Business Review and Strategy Meeting led by CEO John Smith, key department heads provided updates on their respective areas of responsibility. Emily Davis, the COO, reported that production targets for Q4 are on track, attributing a 15% efficiency boost to a new manufacturing process. Michael Johnson, the CFO, delivered positive news with a 10% increase in Q3 revenue, coupled with expenses well within budget. Sarah Lee, Head of Marketing, shared an impressive 20% surge in pre-orders for a new product, thanks to targeted ad campaigns and influencer collaborations. James Anderson, Head of Sales, reported a remarkable 30% conversion rate and promising discussions with a potential key account. Emphasizing proactive supply chain management, Emily secured alternative suppliers for critical components, mitigating potential delays. Michael proposed a budget allocation for R&D, highlighting the significance of innovation in sustaining long-term growth. CEO John Smith praised the team's dedication and encouraged open feedback. Sarah raised concerns about inventory management, prompting Emily to pledge close coordination with the production team.The meeting concluded with a review of upcoming events. Action items included a follow-up meeting on the R&D proposal and ongoing coordination with the production team to ensure seamless operations.

Research Gaps vs Innovation

Poor performance of summarization medels for long input and transcripts	Divided transcript into meaningful chunks and used ngrams to maintain context
Lack of annotated datasets for action items	Manually annotated + AI generated records
Proprietary architecture of meeting bots	Created new modular bot architecture
Limited to English language support	Used whisper open-source multi-language Speech to Text API
High computational processing requirements	Implementation in microservices architecture

Applications

- Board meetings
- Business conferences
- Academic conferences
- Classroom lectures

Online Meetings:
- Meeting is over? Upload the recording
- Meeting is live? Invite the bot
- Meeting scheduled? Bot will join automatically

Offline Meetings:
- Record live and stream to server

Impact

- 11 million meetings are held each day.
- 15% of an organization's time is spent in meetings.
- Managers spend 35% of their time in meetings.

Summarizing meetings and automating the task of producing minutes of meeting can ensure:
- Participants don't spend time taking notes
- Participant don't need to remember tasks
- Hosts can easily get an overview of any meeting and also view summaries of previous meetings.

References

[1] Y. Zhang et al., "Summ^N: A Multi-Stage Summarization Framework for Long Input Dialogues and Documents," arXiv:2110.10150 [cs], Apr. 2022, Accessed: Mar. 22, 2023. [Online]. Available: https://arxiv.org/abs/2110.10150

[2] K. Sachdeva, J. Maynez and O. Siohan, "Action Item Detection in Meetings Using Pretrained Transformers," 2021 IEEE Automatic Speech Recognition and Understanding Workshop (ASRU), Cartagena, Colombia, 2021, pp. 861-868, doi: 10.1109/ASRU51503.2021.9688167.

3] M. Li, L. Zhang, H. Ji, and R. J. Radke, "Keep Meeting Summaries on Topic: Abstractive Multi-Modal Meeting Summarization," Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics, 2019, doi: https://doi.org/10.18653/v1/p19-1210.