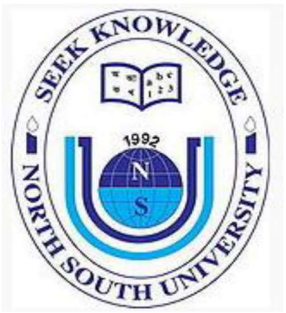

North South University

CSE 499A: Senior Design Project I

Social Environmental Effects

Project Title

AutoNote: Transformative Meeting Summarization and Highlighting Points based on NLP

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Social Environmental Effects

AutoNote

Transformative meeting summarization and highlighting points based on NLP

Overview

In modern workplaces, meetings are essential for collaboration and decision-making. Automatic meeting summarization, powered by Natural Language Processing (NLP), aims to address this challenge by distilling key meeting insights into concise summaries. Sometimes, we miss meetings happening online due to unavoidable circumstances. Again, sometimes, we miss out on essential meeting points for various reasons. However, before our important work or study time is crucial, we must do it faster or optimally. That's why we need to summarize a long meeting to understand quickly and quickly within our due time. Therefore, the gist of an online discussion is often very important to those who missed it or those who try to recall it. There can be a system that can make a summary of a meeting while it is running online. This NLP summarizing develops a system that can automatically generate accurate and informative summaries of meetings. However, this meeting outlines and highlights many social and environmental effects, although the specifics may vary depending on the scale and context of its implementation.

Carbon Footprint

The summary from a meeting session will be uploaded to cloud storage. So, the paper usage will be less. That's why the carbon footprint will be less. Generating summaries from online meetings or classes, the carbon footprint is related to the environmental impact of the technology and infrastructure required to support the project.

- **Server Infrastructure:** The project involves processing video content to generate text summaries and highlighting points. This processing likely occurs on servers or data centers, which require electricity. The carbon footprint is associated with the energy consumption of these servers. Using energy-efficient servers and data centers can help reduce this impact.

- **Video Streaming:** Online meetings and classes involve streaming video content to participants. The carbon footprint includes the energy required for video encoding, transmission, and decoding. Efficient video compression algorithms and content delivery networks (CDNs) can minimize the energy consumption associated with video streaming.
- **Softcopy:** After summarizing the meeting, it will be printed as a softcopy. As it can be noted through only so in maximum cases hard copy use is less. As a result, soft copy can reduce the use of paper. So that it reduces the carbon emission and carbon footprint for paper production and ink.
- **User Devices:** Participants in online meetings or classes use various devices, such as computers, tablets, and smartphones, to access the content. The carbon footprint also depends on the energy efficiency of these devices. Encouraging users to use energy-efficient hardware can indirectly contribute to a lower carbon footprint.
- **Data Storage:** Storing video recordings of meetings or classes and their corresponding summaries can also have an environmental impact. This includes the energy consumption of data storage infrastructure. Employing data storage solutions that prioritize energy efficiency and data center sustainability can mitigate this impact.
- **Internet Connectivity:** Accessing online meetings and uploading video content for processing requires internet connectivity. The carbon footprint includes the energy consumption of network infrastructure and data transmission. The efficiency of internet service providers and the choice of network technologies can affect this footprint.

To reduce the carbon footprint in this context, consider the following:

- Optimize server and data center energy efficiency.
- Use video compression techniques to reduce streaming energy consumption.
- Encourage users to use energy-efficient devices.
- Implement data storage solutions with sustainability in mind.
- Support and promote energy-efficient internet connectivity practices.

Considering these factors and making choices that prioritize energy efficiency and sustainability throughout your project's infrastructure and operations can help minimize its carbon footprint while still achieving the goals of generating meeting/class summaries and highlighting key points.

Power consumption

The summarization, which involves generating summaries from online meetings or classes through video analysis, power consumption is a critical aspect related to the energy requirements of the technology and infrastructure involved. The system converted into the software version will not affect the power usage of a PC. So, the system will only affect power consumption a little.

- **Video Processing:** One of the primary contributors to power consumption is the video processing phase. Analyzing video content, extracting critical information, and generating text summaries and highlights demand computational resources. The power consumption is directly related to the computing power and efficiency of the hardware used for these tasks.
- **Server Infrastructure:** The servers or data centers hosting the video analysis algorithms and services require significant power. The more powerful and numerous the servers, the higher the overall power consumption.
- **Data Transmission:** Data transmission occurs when video content is uploaded to a platform, and users download or access summaries. This involves power consumption in network equipment, including routers, switches, and data centers. The efficiency of data transmission can impact power consumption.
- **Electricity:** Electricity is the essential energy source for the technology and infrastructure involved in power consumption. It powers data centers, servers, networking equipment, and user devices for video analysis and summarization. Optimizing the efficiency of hardware, algorithms, and data center locations is crucial for reducing electricity consumption. This can lead to cost savings and environmental benefits by minimizing carbon emissions of the greenhouse effect associated with electricity generation. The greenhouse effect refers to the trapping of heat in the Earth's atmosphere due to the accumulation of greenhouse gases, primarily carbon dioxide (CO2). Power consumption, mainly if it relies on electricity generated from fossil fuels, can contribute to increased CO2 emissions. These emissions intensify the greenhouse effect, leading to global warming and climate change.
- **User Devices:** Power consumption also extends to the devices used by meeting or class participants. This includes computers, smartphones, tablets, and other devices that access and interact with the platform. Efficient device usage can help reduce the power consumption associated with your project.

- **Real-time Processing:** If this aims to provide real-time summarization and highlighting during live meetings or classes, it may require specialized hardware, such as GPUs (Graphics Processing Units) or TPUs (Tensor Processing Units), which consume varying amounts of power depending on their efficiency and usage.

To address power consumption:

- Optimize the efficiency of video processing algorithms to reduce computational requirements.
- Consider energy-efficient server and data center infrastructure.
- Implement efficient data transmission protocols and technologies.
- Encourage users to use energy-efficient devices for accessing your platform.
- If real-time processing is a goal, hardware should choose one that balances performance and power efficiency.

Balancing power consumption is essential to reduce energy costs and environmental impact while maintaining the effectiveness of video analysis and summarization capabilities. This optimization will also contribute to the overall sustainability of the system.

Energy Efficiency

Virtual meetings typically consume less energy than in-person meetings, especially considering factors like heating, cooling, and lighting in physical meeting spaces.

- **Reduced Environmental Impact:** Energy efficiency is crucial for minimizing the environmental footprint of the meeting summarization. Using less electricity and computational resources can contribute to lower carbon emissions and reduce its overall impact on the environment, helping combat climate change.
- **Physical Meeting vs. Online Meeting:** Comparing physical meetings to online meetings reveals essential differences in energy efficiency. Physical sessions typically involve travel, which consumes energy and emits carbon emissions, while online meetings require less energy for commuting. However, online meetings rely on electricity to power devices and data centers, introducing their energy consumption concerns. The energy efficiency of online meetings depends on factors such as server infrastructure,

data transmission, and device usage. Optimizing these elements can make online sessions more energy-efficient than physical ones, particularly when considering reduced travel-related emissions. Balancing energy efficiency in both meeting formats is crucial for achieving sustainability goals.

- **Efficient use of Internet and Electricity:** Efficient use of the Internet and electricity is essential for maximizing energy efficiency. Regarding the Internet, using data compression techniques, content delivery networks (CDNs), and efficient data transmission protocols can reduce energy consumption during data transfer. This minimizes the environmental impact of online meetings and video analysis. Optimizing server infrastructure and algorithms can also lower electricity consumption during video processing. Encouraging users to employ energy-efficient devices and practices when accessing your platform further contributes to energy efficiency, aligning with sustainability objectives while maintaining adequate service delivery.
- **Cost Savings:** Improving energy efficiency can lead to significant cost savings. Lower power consumption means reduced energy bills, which can be especially important for data center operations and large-scale computational tasks.
- **Sustainable Practices:** Prioritizing energy efficiency aligns with the sustainability goals. It demonstrates a commitment to responsible resource use, which can appeal to environmentally conscious users and organizations.
- **Enhanced Scalability:** Energy-efficient algorithms and hardware can scale more effectively. As this grows, efficient resource utilization ensures it remains cost-effective and environmentally responsible.
- **Improved User Experience:** Energy-efficient designs can result in smoother and faster user experiences. Users are less likely to encounter delays or resource bottlenecks, leading to greater satisfaction.
- **Related Energy:** Online meetings promote energy efficiency by reducing the carbon emissions and energy consumption associated with transportation to physical meetings. Additionally, they lead to less resource-intensive food production and waste, further enhancing their environmental benefits.

Finally, emphasizing energy efficiency throughout the online meeting summary is vital to minimizing environmental impact, reducing costs, and aligning with sustainability goals, making it practical and environmentally responsible.

Conclusion

Transformative Meeting Summarization and Highlighting Points based on NLP represent a pioneering leap forward in communication and technology. By harnessing the power of Natural Language Processing, this project has the potential to revolutionize the way meetings are conducted and knowledge is shared. Its significance goes far beyond mere convenience and efficiency. It embodies a paradigm shift in how organizations collaborate, significantly reducing the need for resource-intensive physical meetings. This reduction in travel not only translates to cost savings but also carries the promise of a substantially lower carbon footprint, thereby contributing to environmental sustainability in an increasingly interconnected world. Furthermore, this serves as a testament to the transformative power of technology, seamlessly integrating with our daily lives to enhance productivity, reduce waste, and promote a more eco-conscious approach to business and communication. Essentially, it represents the harmonious coexistence of technological advancement and a greener. Ultimately, this enhances productivity and promotes sustainability and eco-conscious approaches in the modern workplace.

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